

PLAINTIFF'S
EXHIBIT

ETCO-147

LITHEL CORPORATION

ETC 30575

ETHYL NEWS INDEX-1957

AGRICULTURE

- Architects of Abundance (ASAE 50th anniversary) May-June
Plowmen on Parade (World plowing matches) September-October

AUTOMOTIVE AND AVIATION

- "More Mileage to You" (Booklet for motorists) July-August
One Man's Family Runs an Airport July-August
Safety Is Its Business (Flight Safety Foundation) September-October
Three Billion Miles for Rent (U-drive-it cars) May-June

ETHYL CORPORATION

- AK-33X—Ethyl's New Antiknock May-June
Baton Rouge Plant Completes 20 Years of Operations September-October
Burdick, A. C., Jr., Heads New Engineering Department January-February
Charting the Magic Circle (Planning new advertisements) July-August
Clear Site for California Plant January-February
Cooling System Film Added to Automotive Series March-April
Ethyl Advertisement Appeals to Women May-June
Ethyl Overseas September-October
For Outstanding Cooperation (Defense Department award) May-June
Fuel Injection (Motion picture and instrumented cars) May-June
Furthering the American Way (Awards for public service) March-April
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Method in the Making, A (TEL manufacturing process) September-October
New Approach to TEL, A (TEL synthesis) March-April
New Plant in Miniature (Scale model) March-April
New Plant Taking Shape July-August
Plant Opening in Chemical Valley (Ethyl of Canada) May-June
Premium Gasoline Under the Lens (Premium fuel survey) September-October
Priming the Idea Pump (Creative thinking) January-February
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ETHYL NEWS INDEX-1957 (continued)

ETHYL CORPORATION (cont'd.)

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What Ethyl Means to Canada	May-June
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Portrait of a Molecule (Gasoline hydrocarbons)	January-February
Thickening the Plot with Oil (Dime novels)	March-April

SPECIAL ISSUE

American Petroleum Institute annual meeting	November-December
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Ethyl News

JANUARY - FEBRUARY 1957



ETC 30578

Ethyl News

JANUARY - FEBRUARY 1957



THE COVER: Winter and summer, trucks like this haul wood to paper-pulp mills, largest chlorine consumers in the nation. For more about important and increasing uses for chlorine, see "From Autos to Zirconium," starting on page 12.

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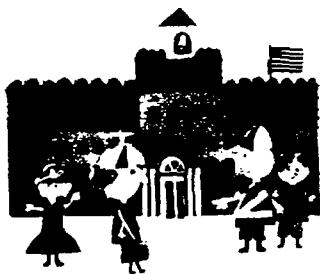
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Ethyl Corporation, 100 Park Avenue, New York 17, N. Y.
manufacturer of "Ethyl" antiknock compounds, used by oil companies to improve the antiknock quality of motor and aviation gasoline.

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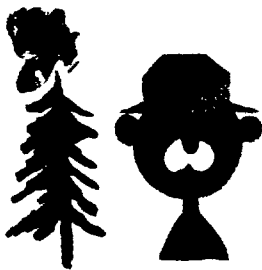
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ETC 30579



Better Schools



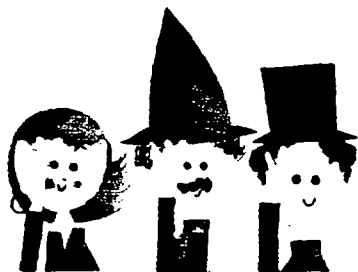
Forest Fire Prevention

Business Alerts America

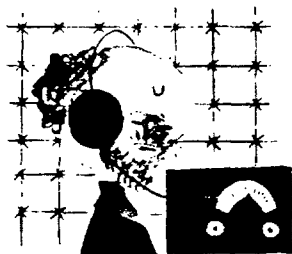
Through The Advertising Council it focuses public attention on many worthwhile endeavors



Safe Driving



Get Out the Vote



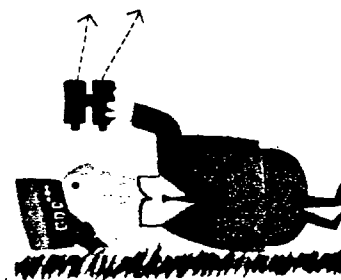
Radio Free Europe



Neighborhood Improvement

EVER SINCE the darkest days of World War II, when Americans everywhere were urged to "Button Your Lip," "Plant Victory Gardens," and "Buy War Bonds," organized public service advertising has been doing a tremendous job for the welfare of America and much of the Free World.

The wartime slogans and appeals, of course, have long since been replaced by admonitions to "Prevent Forest Fires," "Worship Together This Week," "Fight Communism With Truth Dollars," "Vote But Don't Vote In The Dark," and scores of others. But the objectives remain the same: to alert Americans to social, civic and economic problems and get them to support and participate in organizations



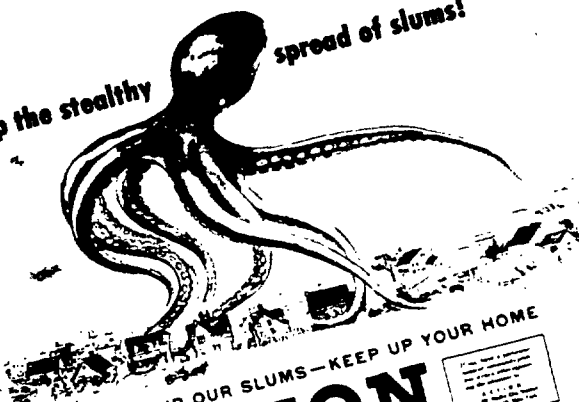
Plane Spotters

Please...be careful!
**PREVENT
FOREST
FIRES!**



- BREAK YOUR MATCHES
 - CRUSH YOUR SMOKES
 - DROWN YOUR CAMPFIRES
 - BE CAREFUL WITH ANY FIRE!
- Thanks **SMOKEY**

Stop the stealthy
spread of slums!



CLEAN UP OUR SLUMS—KEEP UP YOUR HOME

ACTION
American Council To Improve Our Neighborhoods



and efforts dedicated to combating such problems.

Appearing on radio, television, outdoor posters, subway, bus and trolley placards, and in newspapers and magazines, the messages make millions of impressions a day. Many of the public service campaigns are so effective that their slogans have become household words. Still, little is known about who plans, produces and sponsors them.

Immediately responsible for most of this national public service advertising is The Advertising Council, the non-profit, non-partisan organization whose crossed pen and sword trade-mark appears on its messages. Standing behind The Advertising Council and working closely with it is American business. As a good citizen, aware of its social and civic responsibility, business gives generously of its time, interest and money to help The Advertising Council achieve national goals which otherwise might be approached—if approached at all—only under the aegis of government.

"Through The Advertising Council, American business supports more causes, solves more prob-

lems and serves more people than is possible through any other single institution," says Charles E. Wilson, former president of General Electric and chairman of the Council's Industries Advisory Committee.

As Theodore S. Repplier, Council president, puts it, "Business is being a good citizen through the vehicle of advertising."

Created during World War II by the American Association of Advertising Agencies, the Association of National Advertisers and other trade groups when there was need for an organization to bring patriotic appeals to the nation, The Advertising Council sponsored a billion dollars' worth of advertising. All told, the Council, with the cooperation of American business, has sponsored more than 200 national public service campaigns.

During 1956—its biggest peacetime year to date—the Council coordinated \$150 million worth of voluntarily contributed advertising time and space. It told the story of such diversified but worthwhile causes as Better Schools, Hungarian Relief, CARE,

Among the worthwhile endeavors that business supports through The Advertising Council are forest fire prevention, slum clearance, church attendance, Better Schools and the Ground Observer Corps.

America's most important desk job



*He restoreth
your soul...*

Worship together this week

LOOK...LISTEN...AND LIVE ➔



JOIN SKYWATCH — Contact Civil Defense



GROUND OBSERVER CORPS

ACTION (American Council to Improve our Neighborhoods), the Red Cross Fund Drive, Civil Defense, Crusade for Freedom, Forest Fire Prevention, Ground Observer Corps, Religion in American Life, Religious Overseas Aid, Safe Driving, United Community Campaigns and U. S. Savings Bonds.

Evidence of business' interest in and support of The Advertising Council is quickly seen in a look at the names on the organization's policy-making boards and committees. Some 62 high-ranking officers from American business, industry, radio and television, and advertising and publishing sit on the board of directors. On the Industries Advisory Committee, which helps raise operating funds and advises the Council on such campaigns as those dealing with inflation and the American economic system, are 17 chairmen and 41 presidents of prominent companies. The Public Policy Committee is composed of 20 eminent Americans drawn from business, labor, education and finance.

For all the breadth and importance of its work,

The Advertising Council operates with a paid staff of only 40. In both spirit and practice, however, the Council carries on its campaigns through the resources of business and the entire advertising industry. Business and advertising supply the financing and the guidance. Advertising executes the campaigns and places the messages where they will reach the most people effectively.

One of the most significant projects launched by The Advertising Council since its inception is the provocative "People's Capitalism" instituted last year (ETHYL NEWS, January-February 1956). "People's Capitalism" interprets American capitalism for people in this country and those abroad as well. It shows that America has developed a way of life that stands apart from anything practiced anywhere else and offers a way of advancement based on the freedom and dignity of the individual.

Its name, "People's Capitalism," and the obvious threat to Communism that it presents already have put dents in the Iron Curtain. So effective is it that Communist party boss Khrushchev, former

Foreign Minister Shepilov, and leading Communist economists have attempted to counter its effects with blasts of denunciation. Together with the term "Iron Curtain," the name and concept "People's Capitalism" are reliably reported to have done more harm to Communist solidarity than anything in recent years.

While helping tell the story of "People's Capitalism" on both the home and overseas fronts, The Advertising Council does a tremendous job in purely domestic endeavors—such as enlisting interest in and support of our public schools.

When the "Better Schools" campaign was launch-



Advertising Council President Theodore Repplier and President Eisenhower visit a Council exhibit.

ed four years ago, there were 17 known citizens' committees working on local school needs. Today, there are 12 to 15 thousand.

Another recent successful campaign and one of more "front page" significance was the Hungarian relief project. Set in motion while the revolt was still at its height, this campaign drew immediate support from advertisers, broadcasters and publishers. By Christmas, when it had been under way less than a month, more than 410 million home impressions had been made by radio and television alone. The public responded with approximately \$5 million for the Red Cross, \$2 million for CARE food packages.

These campaigns and the others that The Adver-

tising Council promotes are all handled in pretty much the same way. For each there is a volunteer coordinator—usually the advertising manager of a prominent business firm—and a volunteer advertising agency. Working closely with The Advertising Council, these people prepare the display ads, the magazine and newspaper copy, and the radio and TV messages that tell the story of the endeavor to which they are devoted. In many cases, radio, motion picture and television performers also donate their time and talents to the campaigns.

Radio and television networks, publishers, display advertising companies and individual companies which buy advertising contribute the time and space through which messages reach the public.

Because of its proven success, The Advertising Council naturally receives requests from many organizations for sponsorship. It is the function of the Public Policy Committee to evaluate all non-government campaigns proposed to or by the Council on the basis of their benefit to the American people as a whole. Once a project has been adopted—and there are more acceptances than rejections—the organization, The Advertising Council, the volunteer coordinator and the volunteer agency work closely to insure a successful campaign.

Headed by Advertising Man

Theodore S. Repplier, who heads the work of The Advertising Council, is a career man in advertising. He joined the Council (then the War Advertising Council) in 1942 and became president in 1946.

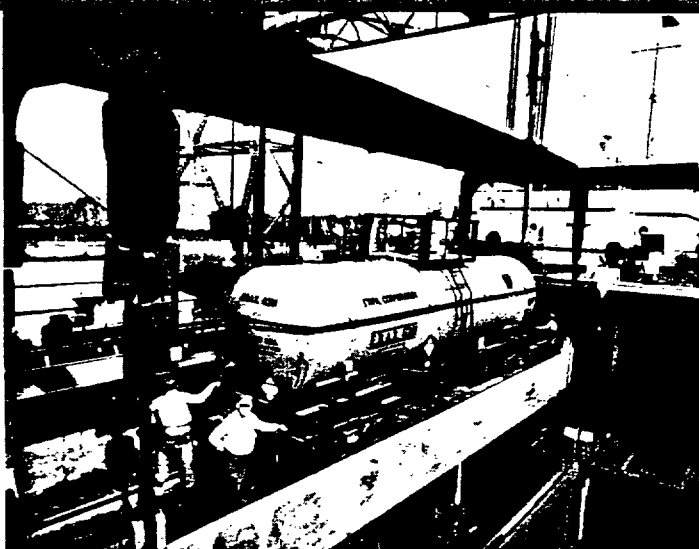
Analyzing the work of The Advertising Council, Mr. Repplier says: "We look upon ourselves as a sort of fire department. Some of the problems we go after are fires which smolder year after year. These we try to damp down. Others are flash fires which we try to put out right away.

"Our general aim is to take on problems that can be combatted by the action of masses of people."

Among the projects ahead are campaigns in behalf of mental health, financial aid to education and "People's Capitalism."

Mr. Repplier sees The Advertising Council's rise as a direct reflection of the growth of American business in its role as a good citizen. Since there is every indication that this growth is going to continue, there's no telling just how effective a weapon the Council can become in campaigning for social, civic and economic advancement. #

To Cuba by Tank Car



An Ethyl tank is loaded aboard the car ferry for Cuba.

AS THE LATEST STEP in its continuing efforts to expedite and improve deliveries to customers, Ethyl Corporation in mid-January made the first tank car shipment of antiknock compounds ever to go to a refiner overseas. In a few short days, a tank car loaded with "Ethyl" fluid was dispatched from the Company's manufacturing plant at Baton Rouge, La., to the new Shell Oil refinery at Belot, near Havana, Cuba.

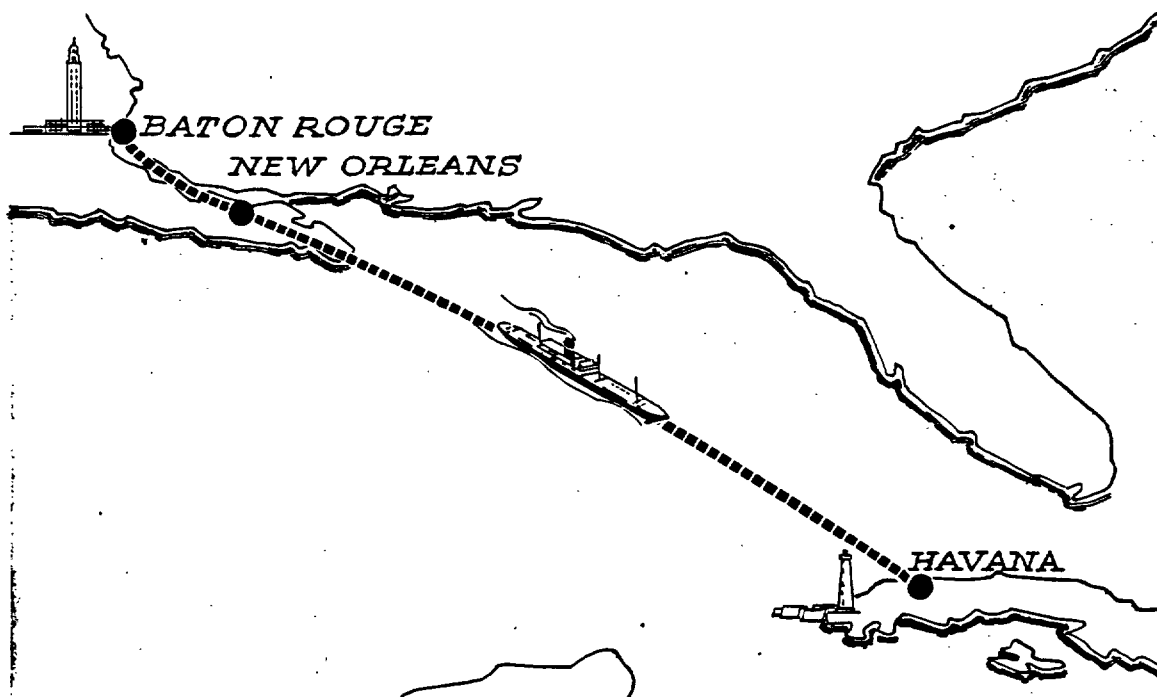
The faster and more efficient delivery service was made possible through the use of a railroad car ferry. After the car was loaded at the Ethyl plant, it went by rail from Baton Rouge to the Port of New Orleans docks at Belle Chasse, La. There the entire tank car, containing 6,000 gallons of antiknock compound and weighing some 40 tons, was lifted by special crane aboard the West India Fruit and Steamship Company's sea ferry "Sea

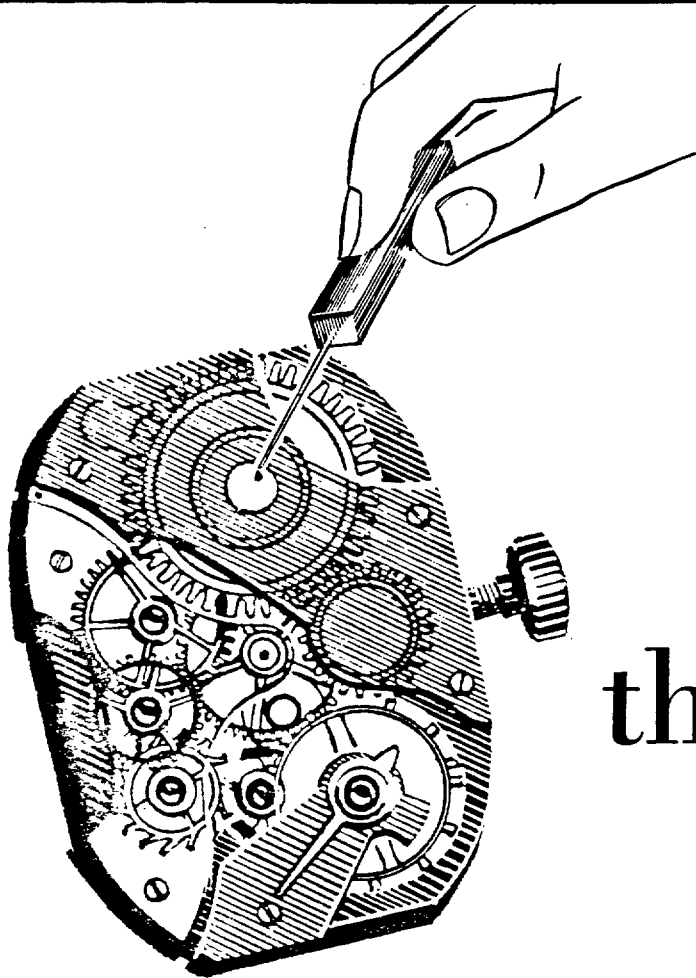
Level" for the brief river and gulf voyage to Cuba.

Two days later, when the ship docked at Havana, the loaded Ethyl tank car was lifted off the ship and lowered onto Cuban railroad tracks at dockside for the short haul to the recently completed Shell refinery.

To transport the same amount of "Ethyl" fluid would have required 107 steel drums. Thus, beside speeding up and simplifying transportation operations, the new method of shipment saves time and increases efficiency at the customer refinery. Blending plant personnel there can unload a tank car three times as fast and with far less work than if the shipment were made in drums.

As tank car shipments to the Shell refinery at Belot, Cuba, continue, Ethyl is studying new ways to improve shipments of its products to other locations throughout the United States and abroad. #





Oiling the Wheels of Time

— At \$1,500 a gallon watch oil has to go a long way—and it does —

IN THE TORRENTIAL FLOW of petroleum products that courses from the country's refineries every year, 13 gallons is far less than a drop in the bucket. Yet that microscopic amount is the total output of a refinery whose production is vital to an American industry and important to the national defense.

Admittedly the world's smallest, the Lilliputian refinery is owned and operated by the Hamilton Watch Company, in Lancaster, Pa.

Although its pipes, tubes, stills and towers are composed almost entirely of special glass and the entire installation is housed in a single laboratory room, the Hamilton refinery is no pilot operation. It is in regular commercial production, turning out the oil that Hamilton and watchmakers and jewelers throughout the country use to lubricate watches and clocks.

That the refinery is something special is seen not

only in its small throughput but also in the value of its products. The 13 gallons of watch oil that its manufacturing processes yield each year are valued at \$19,500—or \$1,500 a gallon. But these prices are not inflating the costs of watchmaking, maintenance or repair. Hamilton uses only an ounce of the oil a week in its entire plant and a one-tenth-ounce bottle supplies the average jeweler's and watchmaker's requirements for a full year.

Produced Fuse Oil

The flexibility of the tiny refinery and its importance to the armed forces was demonstrated during the Korean war. Hamilton, a manufacturer of time fuses in World War II and in the Korean conflict, used the facility to produce a new fuse oil according to rigid Ordnance specifications. Total wartime production reached the unheard-of total

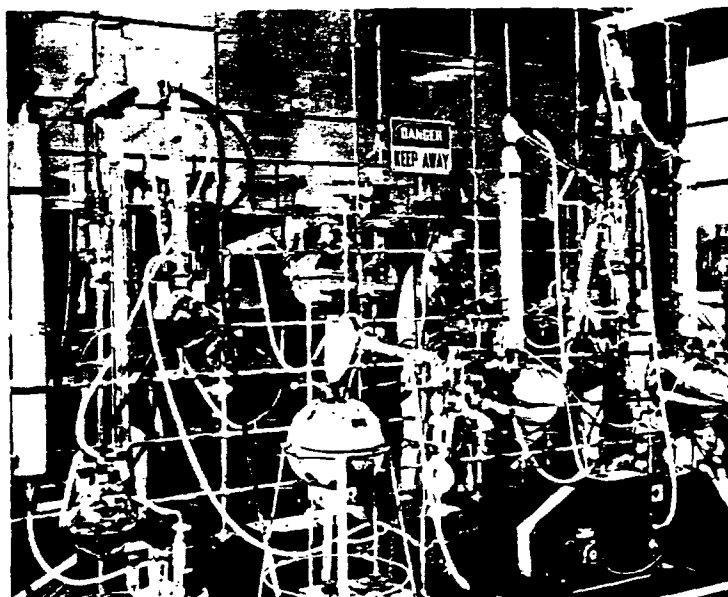
of more than 1,400 gallons as Hamilton supplied its own fuse oil needs and those of other fuse manufacturers.

Now in normal peacetime production, the refinery is producing the watch oil that Hamilton's research staff developed when World War II threatened to cut off supplies which previously had come from France. The synthetic oil is made from some 20 chemicals in a batch manufacturing process. The basic ingredients are subjected to some 11 processing steps, including eight purifications and distillations, before the fine finished product is obtained. Among these are phenylation, saponification, hydrolysis, electrification, and high and low vacuum and molecular distillation.

One Additive Included

Just one additive is included in the finished oil—to increase oiliness and corrosion resistant qualities.

While developments in lubrication of timepieces traditionally have lagged behind watchmaking, the problem became more acute during the 1930's with the trend to smaller and smaller watches. Unlike the motor oil which the petroleum industry produces in large quantities for America's millions of



The Hamilton refinery is made almost entirely of glass and is housed in a single laboratory room.

OIL PROPERTIES

Technically minded readers may be interested to see how the properties of Hamilton's watch oil compare with those of a typical lubricating oil used in modern automobiles.

PROPERTY	HAMILTON'S WATCH OIL	TYPICAL SAE 20-20 W MOTOR OIL
Kinematic Viscosity @ 100° F. (centistokes)	56.0	67.0
Viscosity Index	80.0	100
Pour Point (degrees Fahrenheit)	minus 30°	minus 10°
Specific Gravity @ 25°/25° C.	.977	.870
Refractive Index @ 25° C.	1.5070	1.48285
Coefficient of friction (steel on sapphire)	.080	*
Contact Angle (steel and ruby)	35° or above	*

*Not applicable to motor oil

automobiles, watch oil must be non-spreading. It must "stay put" at the point where it is applied originally and must remain in an unchanged state over long periods of time.

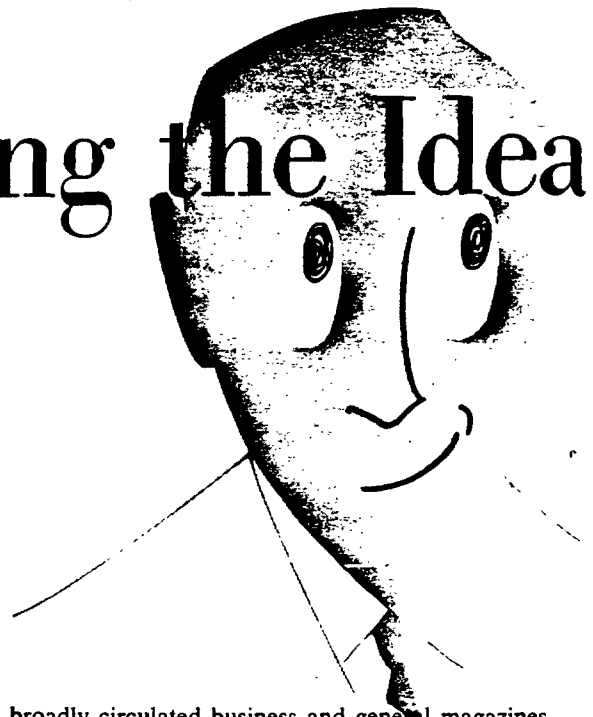
Additionally, watch oil must afford adequate lubrication in hot or cold surroundings. It must not evaporate or become gummy and rancid. It must not attack pivot or bearing materials.

In searching for ingredients that would make up into an oil with these desired qualities, Hamilton researchers investigated some 8,000 materials. In the end, they not only developed a satisfactory standard watch oil, they also came up with a thinner version for the more delicate mechanisms of ladies' watches, a watch grease and the fuse oil.

While most of these fine lubricants contain none of the mineral oil from which the industry refines great quantities and varieties of petroleum products, they do an essential job in oiling the wheels of time. #

Priming the Idea

The principles of "creative thinking" are presented in one of Ethyl's newer services



ONE OF THE MOST talked-about subjects in American business, industry and government right now is "creative thinking." In research laboratories, sales and advertising organizations, manufacturing plants, business offices and in the armed forces, employees at all levels are being encouraged to come up with more and better ideas.

And it's no wonder. In the competitive world of 1957, good ideas and a little imagination make a big difference. They separate the valuable individual from the average performer, the productive research project from the fizzle, the profitable sales campaign from the dud, the prosperous nation from the poor one, the successful company from the also-ran.

Good ideas, of course, always have been welcomed, but until recently there has been little organized campaigning for them. Now, however, under such titles as "creative thinking," "ideation," "brainstorming," and others, planned sessions and programs are conducted to stimulate the flow of constructive new ideas.

Programs Widely Hailed

These sessions and programs have caught on so fast, they are receiving wide publicity. They and the philosophy behind them have been the subject of articles in *Business Week*, *Chemical Week*, *Petroleum Week*, *World Oil*, *The Wall Street Journal*, *Reader's Digest*, *Printers' Ink*, *Newsweek*, *Life*, *Fortune*, *Harvard Business Review* and other

broadly circulated business and general magazines.

Most of the thought stimulation leaders who present these programs don't claim they can teach employees to think in one easy lesson. They are pretty sure, though, they can help create atmospheres and suggest procedures that make it easier to come up with more and better ideas.

Among the companies that have pioneered in the application of thought stimulation techniques is Ethyl Corporation. Ethyl has studied creative thinking for some time and for the last couple of years has shared its experience and knowledge with others. Interest in this program grew so fast soon after it was introduced that Ethyl made it a new kind of customer service.

Ethyl representatives, fully trained in the techniques of creative thinking and in the most effective



Pump

Colorful flannel boards and actual case histories are used by Ethyl representatives in "creative thinking" presentations.



ways of passing them on to others, work with customer oil companies, government agencies and trade, professional and charitable organizations. They explain some of the basic concepts and demonstrate how they can be applied. In some cases, Ethyl trains personnel in oil companies to conduct creative thinking programs of their own.

The five creative thinking experts—one in each of Ethyl's four regions and one in Ethyl Corporation of Canada Limited—have successfully explained and demonstrated creative thinking before scores of oil industry and other groups in the last year.

When Ethyl representatives present information on the development and use of new ideas, they discuss and demonstrate planned and proven processes for getting thoughts to flow freely. They in-

troduce their subject by explaining why new ideas are important and how they help in modern business and industry. They answer such questions as: How do I get started thinking up new ideas? Once I get started, how do I keep the ideas flowing? What do I do when apparently I am mentally blocked? How do I get others to use my ideas?

Conduct Practice Sessions

As a part of their presentations, the Ethyl creative thinking experts explain "brainstorming" and conduct practice "brainstorming" sessions. It is this phase of creative thinking, more than any other, that has captured the public's imagination and has received the most publicity.

Actually, brainstorming is one technique for stimulating people to come up with new ideas and keep them flowing. Because it involves the interplay of thoughts between members of a group and rules out evaluation and criticism of ideas proposed, brainstorming helps sweep away the mental blocks that often disrupt thinking processes.

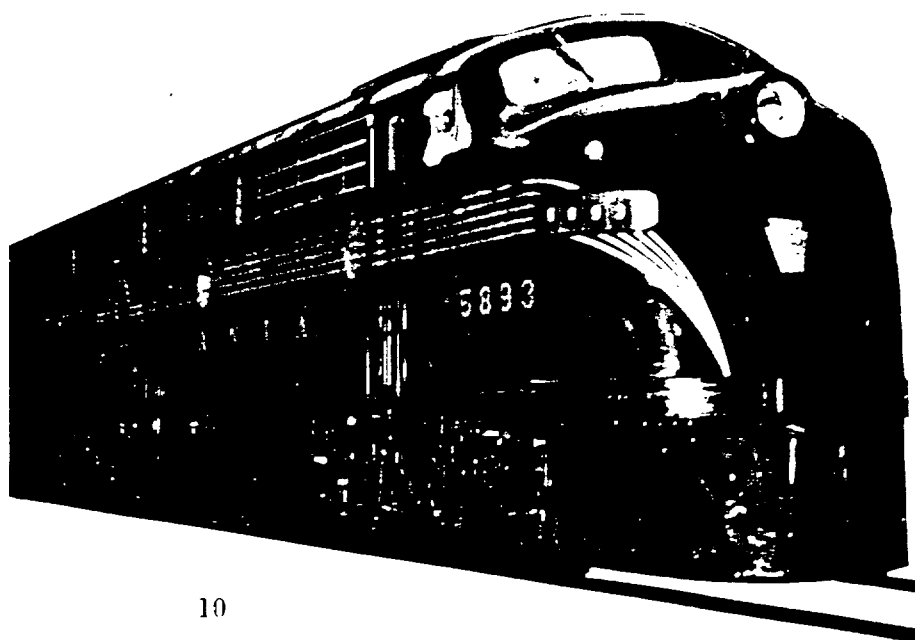
The Ethyl presentations, of course, are not designed to provide the solution to specific problems in the companies where they are presented. Often, however, to demonstrate the application of creative thinking techniques, questions of particular interest to those in attendance are used as examples for discussion. In this way, company managements can see how the techniques included in Ethyl's creative thinking service program can be applied. #





An Oil Name Rides

Samuel M. Kier's memory is perpetuated
by a railroad car that serves his home city



Oil powers the mighty giant diesel locomotives that speed the "Samuel M. Kier" and other railroad cars on their journeys.



From left, a bottle of Kier's "rock oil" and its wrapper; Samuel M. Kier, the petroleum pioneer of western Pennsylvania; and Porter S. and Eliot A. Kier, with the sleeping car named in their great-grandfather's honor.

he Rails

A CENTURY OF PROGRESS has intervened between the use of petroleum as a patent medicine in the 1850's and its use as a fuel for the giant diesel-powered railroad trains of today. The two became closely associated recently, however, when the Pennsylvania Railroad named one of its sleeping cars the "Samuel M. Kier."

Oilmen familiar with the industry's early history know that Samuel M. Kier, a Pittsburgh businessman, was selling the petroleum that seeped into his father's salt wells at Tarentum, Pa., a decade before Colonel Drake drilled his historic well at Titusville. Kier put raw petroleum in half-pint bottles and hired check-suited barkers to peddle it from gilded wagons. His "rock oil" was touted in glowing terms as "a most wonderful remedy for mankind's ills . . ." and a downright bargain at 50 cents.

Later, Kier devised the first known method for refining oil, made it into an illuminant, and developed a burner for it. History records that the first shipment of petroleum from the Drake well was consigned to Samuel Kier.

The naming of the railroad car "Samuel M. Kier" was part of a mass rechristening of all 22 Pullman cars on the "Pittsburghers," the Pennsylvania Railroad's twin overnight trains between New York and the Iron City. As a prelude to Pittsburgh's bicentennial celebration next year, the railroad renamed the cars after business and industrial leaders prominent in the early growth and development of western Pennsylvania.

Other Oilmen Honored

Among other "Pittsburgher" Pullmans are the "B. F. Jones," named for Kier's partner who started Jones and Laughlin Steel Corporation; the "Charles Lockhart," after a founder of Standard Oil and Atlantic Refining, who did much to make petroleum illuminants popular; and the "Jacob J. Vandergrift," for the man who contributed to the growth of the petroleum and pipeline industries.

Descendants of these and the other pioneers whose memory was honored and civic leaders from greater Pittsburgh attended the car rechristening ceremonies. #

from Autos to

Uses for chlorine, versatile industrial chemical, grow
steadily as basic applications spread

By Stanton P. Nickerson

AS AMERICA'S CORNUCOPIA pours out its stream of more and better products for the nation's progress, enrichment and welfare, an increasingly large part of this flow owes much of its diversity and vigor to chlorine. A 15 percent increase in national production, anticipated by the end of next year, is indicative of still wider applications.

The greenish-yellow element has been known and used for so long—nearly 200 years—that it is often taken for granted, like the common salt from which most of it comes. For the most part, industrial chemists and those in related fields are among the few groups which realize that chlorine deserves far more recognition and appreciation.



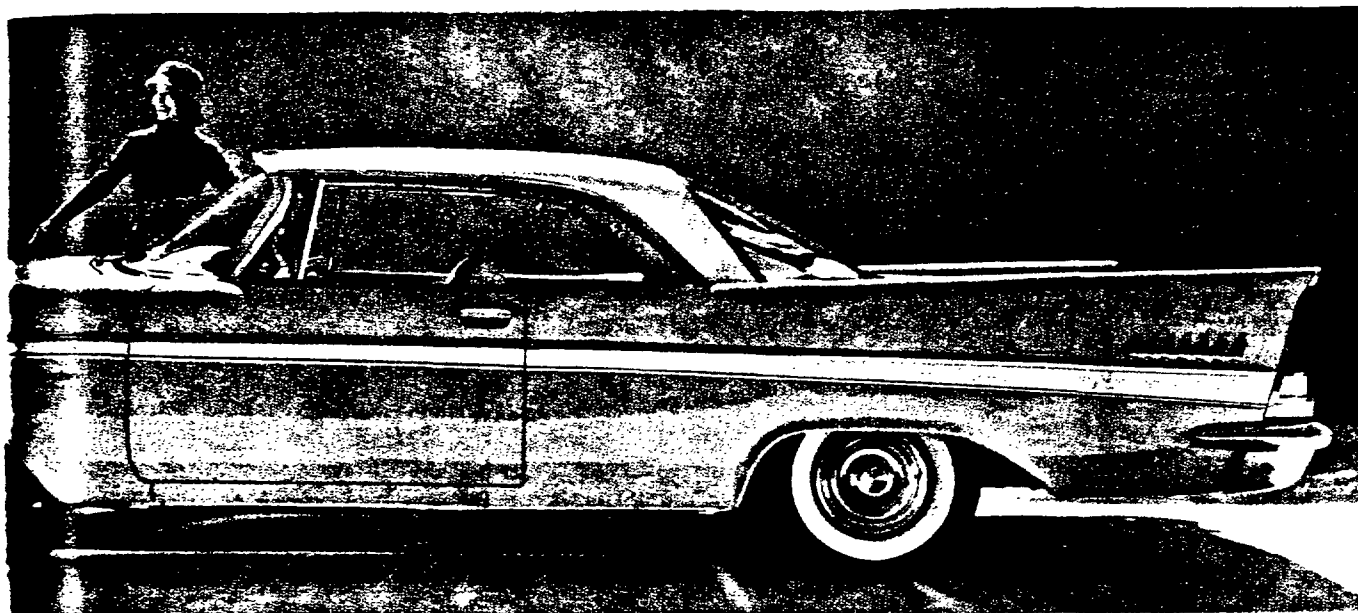
One of the principal reasons for the widespread unawareness of chlorine's versatility is that the element does not appear in many finished products, although their creation would be much more difficult, expensive or impossible without it. Frequently chlorine is an intermediate building block.

Chlorine is applied in different forms and ways, for example, to make automotive and petroleum products, to purify water, prepare drugs and miracle medicines, kill insects and weeds, put out fires, clean milady's dresses, propel rockets, sweeten coffee, bleach textiles and improve dynamite. Without chlorine, all kinds of paper, common synthetic fibers, most plastics, many dyes, adhesives, cosmetics, photographic materials and refrigerants could not be made so easily or economically.

Appearing nowhere in nature in a pure form, chlorine gas was first observed about 1774 by Karl

Calcium chloride makes thousands of miles of rural roads more durable.

irconium



For modern cars, chlorine is used to make body and engine parts, paints, upholstery fabrics, hydraulic brake fluids, radiator anti-freezes, spark plugs,

lamp filaments, rubber and cord for tires, steering wheels and plastic trim. High octane gasoline and lubricants depend on chlorine processes.

W. Scheele in Sweden during laboratory experiments. A British scientist, Sir Humphrey Davy, proved it was an element early in the 19th century. He also gave chlorine its name, taken from the Greek word "chloros," meaning green.

In the United States, chlorine manufacturing by electrolysis of salts began in New England during the 1890's, and spread eventually to the Southwest, the present principal supply area. The chemical was used first as a bleaching and water purification agent. Production of it has climbed rapidly and steadily since 1900 until now more than 10,000 tons are made every 24 hours.

The oil, paper and textile industries currently require the most chlorine. Manufacturers of solvents, insecticides and herbicides rank next, followed by enterprises concerned with plastics and resins, refrigerants, propellants and sanitation.

In the petroleum industry, the element plays many significant roles. Hydrochloric acid is needed in reactivating oil wells and in gasoline refining. Aluminum chloride is another refining tool, with particular importance in lube oil processing. Chlorinated oils and waxes are important in lubricant additives. Numerous chlorine preparations are invaluable in the manufacture of petrochemicals.

Making "Ethyl" antiknock compound involves chlorine intermediates. Ethyl chloride is reacted with sodium-lead alloy to make tetraethyl lead. Ethylene dichloride is among the ingredients added in final "Ethyl" fluid processing. So is ethylene dibromide, which requires chlorine in steps to extract bromine from sea water.

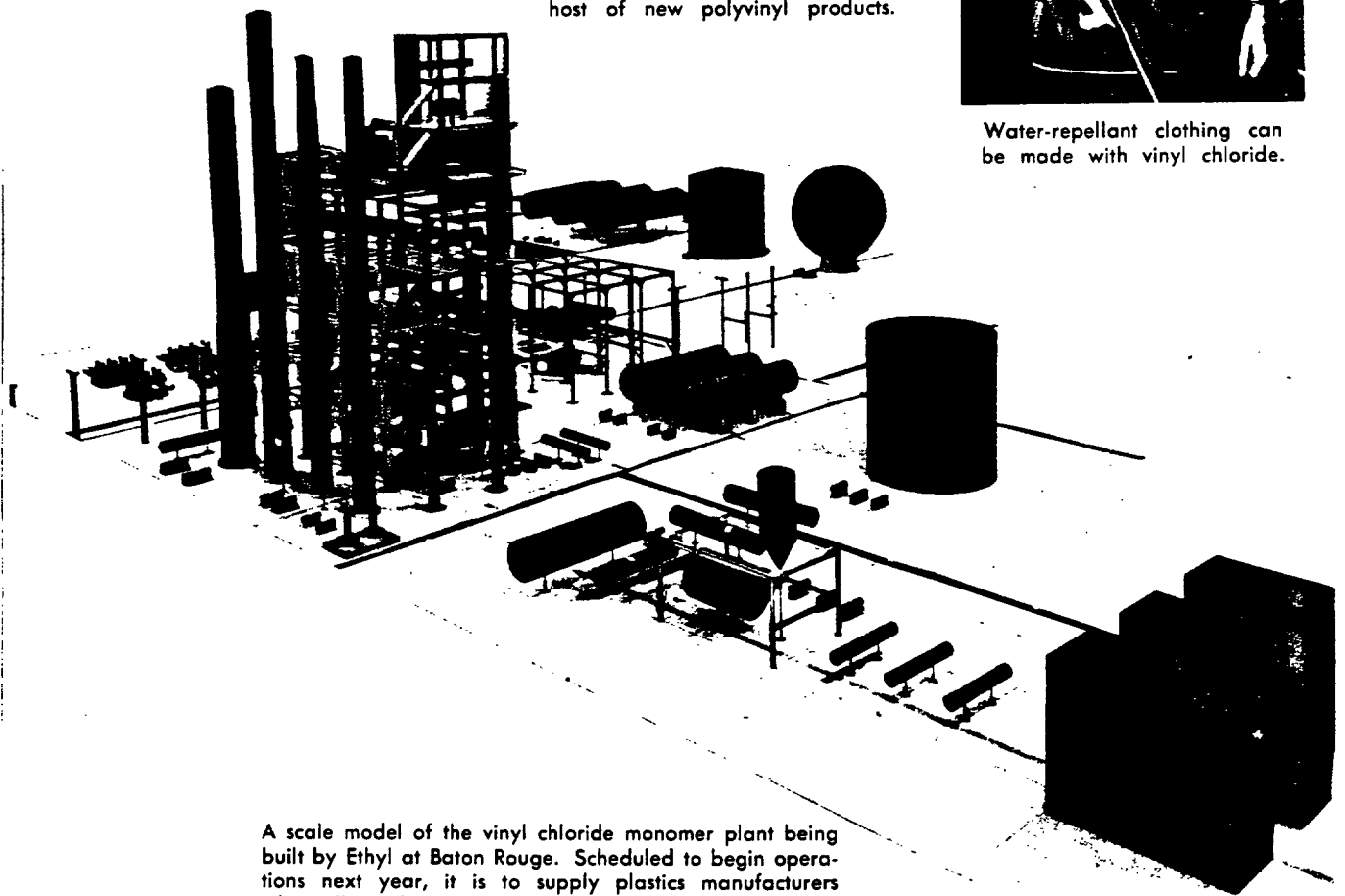
Automobiles require chlorine in various forms and ways. They include processes for extracting magnesium from the ocean and converting the metal



Plastic floor tiles are among a host of new polyvinyl products.



Water-repellant clothing can be made with vinyl chloride.



A scale model of the vinyl chloride monomer plant being built by Ethyl at Baton Rouge. Scheduled to begin operations next year, it is to supply plastics manufacturers who will produce goods like those shown on this page.

Window curtains are typical of the many polyvinyl products available for domestic use.

Tough and durable, polyvinyl plastics are used to make seamless watertight boats.



into car parts. Hydrochloric acid is used to refine tungsten for lamp bulbs and for spark plug manufacturing. Plastics for steering wheels and trim, upholstery and tire rubber and cord owe a substantial share of their facile production and desirable properties to chlorine treatments. So do fabric dyes and automobile paints. Among the products employing chlorinated biphenyls are hydraulic brake fluids.

Non-flammable solvents like trichlorethylene are ideal for degreasing metal components machined for automotive vehicles, farm equipment and planes before plating, painting or assembling.

Certain types of the hardest and most durable asphalt concrete for highway paving obtain a share of their properties from a chlorine treatment. Hazardous encroachment by weeds and parasitic growths along highway shoulders is being reduced by herbicides which contain chlorine as a major ingredient. Signposts and protective fences on curves last longer when wood used is treated with pentachlorophenol.

Used in Metal Refining

Refining rare metals such as zirconium and titanium is one of the more recent developments for expanding chlorine's utility. Zirconium has potentials in atomic reactors. A tetrachloride process is expected to increase supplies of titanium needed for jet planes and to reduce the metal's present high cost.

Polyvinyl materials, representing another new use for the element, already consume more than half of the chlorine required by the entire plastic industry. And small wonder: they become attractive fabrics for car and furniture upholstery, window curtains, water repellent clothing, phonograph records, crop covers on farms, sheathing for pipes, insulation for wires and cables and even boat hulls. Scores of household and domestic uses, including fire-resistant construction panels, help keep the consumption of polyvinyl plastics climbing.

A major producer and consumer of chlorine, Ethyl Corporation is constructing a sizable vinyl chloride monomer plant at the company's antiknock compound manufacturing center in Baton Rouge, La. Scheduled to go on stream early next year, the plant will supply the essential vinyl chloride to plastics firms, which anticipate a doubling of the polyvinyl market within the next five years.

At the same time, the new installation will play an auxiliary role in producing chlorinated compounds needed to make "Ethyl" antiknock fluid. In a second major construction project, the Company will begin a fourth ethyl chloride unit at Baton Rouge later this year, where chlorine will be reacted with ethane in an economical and efficient way to yield chlorinated intermediates.

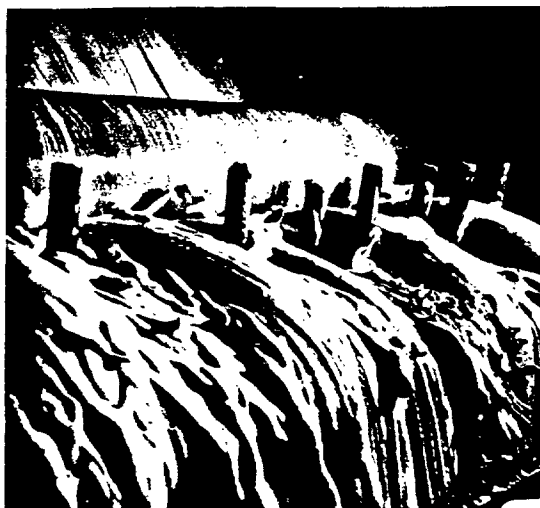
How Ethyl Makes Chlorine

Ethyl produces chlorine and sodium by the electrolysis of common salt at the Company's plants in Baton Rouge and Houston, Texas. Most other manufacturers use another electrolytic process which yields chlorine, hydrogen and caustic soda. Depending on the balance between requirements and production, Ethyl buys or occasionally markets tank cars of chlorine in its liquid form.

Considered one of the most dynamically active chemicals of industry, chlorine has experienced an average growth demand of about 12 percent annually for the past 25 years. New chlorine plants scheduled for completion this year and next will raise daily production by some 1,500 tons by the end of 1958, according to the Chlorine Institute.

This industry association consists of most principal chlorine producers and manufacturers of chlorine processing and handling equipment. It encourages and engages in research and development on further applications for the element and its products. Particular attention is given to chlorine's uses and potentials in the field of health, and to safe production and handling. By close cooperation with industry and public agencies, the Institute serves as a guide and stimulus, working continuously toward the fullest and best uses of chlorine throughout the nation. #

Intermediate steps in manufacturing most textiles include washing, rinsing and chlorine bleaching.



**Ethyl Corporation laboratories use
irradiated materials in fuel
distribution and engine wear studies**

Radioactive Research



IN SEEKING SOLUTIONS to some of the basic problems that concern the petroleum and automotive industries, Ethyl Corporation laboratories use the most modern research tools available. Today, of course, these include radioactive materials. Like other progressive researchers in medicine, agriculture, science and industry, Ethyl engineers are using these materials in some cases to get previously unobtainable data and in others to find desired information faster and more accurately.

Two Ethyl research projects in which radioactive materials currently are helping to provide useful information are engine wear tests and studies

of the distribution of fuel components and additives among the cylinders of automobile engines.

The distribution of fuel components and fuel additives is important to both the oil and automobile industries. An engine's performance is limited even if only one cylinder does not continuously get enough high-octane hydrocarbons or enough tetraethyl lead. An accurate knowledge of fuel and additive distribution is necessary to assure the best possible use of the modern high-quality gasolines now being marketed.

Ethyl has used various methods to study this subject for some time. Recently, however, the

studies were accelerated through the use of radioactive isotopes.

In the procedure, as developed by Ethyl, the tetraethyl lead or one of the hydrocarbons in the gasoline to be used in the test is tagged with the radioactive isotope, carbon-14. A quick-opening (1/1,000 second) sampling valve is installed in each cylinder of the test engine. This valve, which is screwed into the spark plug opening, combines the sampling valve with spark plug electrodes and provides samples of the exhaust gases when the engine is operated. These samples are recovered and transferred to an ionization chamber where the amount of radioactivity is accurately determined. The figure obtained furnishes a precise knowledge of the amount of tagged TEL or hydrocarbon the particular cylinder obtained.

Tritium Now Used

The newest refinement of this study consists of using tritium (hydrogen-3) as the radioactive tracer element. This simplifies and makes less expensive the preparation of tagged hydrocarbons or additive molecules for study and simplifies exhaust gas sample collection. A scintillation counter is used to study the exhaust gas samples containing tritium.

Ethyl also is using radioactive techniques to determine independently and simultaneously the effects of engine operating conditions and other factors on the wear of both the face and the sides of piston rings. While radioactive tracer methods have

been used previously to measure total piston ring wear, the new technique permits the wear on each critical area to be studied under ideal test conditions. Wear rates can be measured in terms of less than one ten-millionth of an ounce per hour.

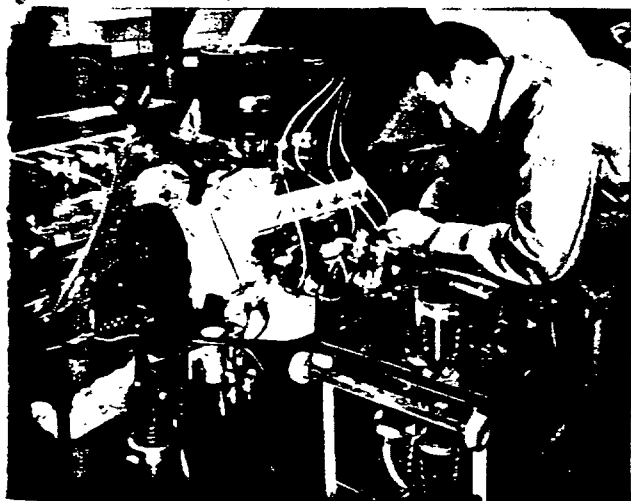
This study involves the use of a standard chromium-plated piston ring. Typical of the top compression ring in most automotive engines, the cast iron ring has a layer of chromium on its face. When this ring is treated in an atomic pile, the radioactive chromium face and iron sides emit gamma rays which can be separated electronically.

Provides Continuous Record

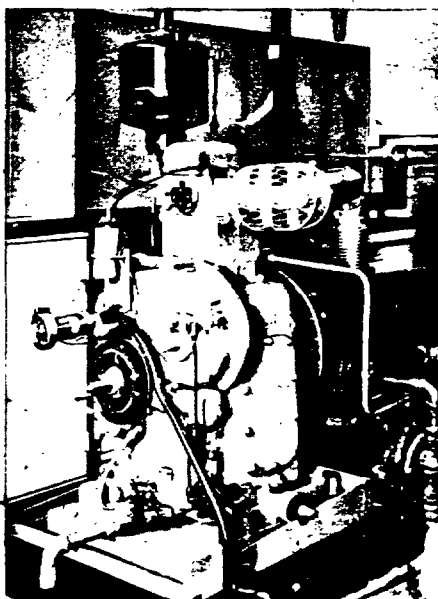
During engine operation, extremely minute particles of the chromium and iron are worn away and enter the lubricating oil. This oil is continuously circulated through a shielded chamber where the gamma rays emitted by the radioactive chromium and iron particles are detected by a special crystal. Since the signals from chromium are different from those from iron, the detector can identify each and portray the results on a dual-channel gamma-ray spectrometer. This provides a continuous record of the wear of both the chromium and iron, from the face and sides of the piston ring.

Here then are two areas of research—fuel-distribution and engine wear—in which Ethyl Corporation is using radioactive materials to provide information which will contribute to greater progress in the petroleum and automotive industries. #

An Ethyl research engineer prepares the test engine and gas sampling and collection system for a study of the distribution of fuel elements to individual cylinders.



Tests to determine the extent of piston ring wear are conducted in this single-cylinder engine.



Let's star

* W. G. Kessel, associate professor of chemistry at Indiana State Teachers College, Terre Haute, Ind., was one of the many ETHYL NEWS readers who wrote to us about "Let's Start in High School," published in our September-October 1956 issue. That article, by T. J. Carron, director of employee training and development at Ethyl Corporation's Research Labora-

tories, cited weaknesses in high school curricula, the shortage of good teachers and lack of constructive parental influence as contributing to the critical scientific manpower shortage. Said Professor Kessel: "Enclosed is a little paper stimulated by reading your presentation. Perhaps it has sufficient merit to publish." We think it has.—The Editors

THE OLD, often-repeated question, "Who's to blame for pupil inadequacies?" is being asked more often today than ever before. This query has new incisiveness in view of the nation's shortage of technically trained personnel.

College and university professors accuse the high schools of failing to prepare college students; high school teachers blame junior highs; junior highs find fault with the elementary grades; and elementary schools point to kindergartens.

The unfortunate kindergarten teachers are sure that Johnny's and Mary's faults stem from parental deficiencies in the home, heredity or both. It is questionable if even the experts can apportion fairly the responsibility for student shortcomings often evident in the attitudes and knowledge of the younger generation.

Schools, however, sometimes are blamed for situations over which they and their staffs have little control. From the standpoint of time alone, it is worth noting that the non-classroom world has the student much longer than the teacher.

An examination of the backgrounds of successful pupils usually reveals that their parents are enthusiastic supporters of education. On the other hand, when the efforts and work of students are unsatisfactory, it is frequently found that their parents pay little or no attention to schooling.

The interest and enthusiasm of parents in education can and do have a long-range but important bearing on the scientific manpower problem. Basic aspects of home environment have a fundamental relationship to the selection of some technical field as a career.

Ill-advised Comments

All too often, for example, mothers and fathers make comments like these, unthinkingly or impatiently, to their children:

"If you say 'Why, Daddy?' once more, I'll send you to bed."

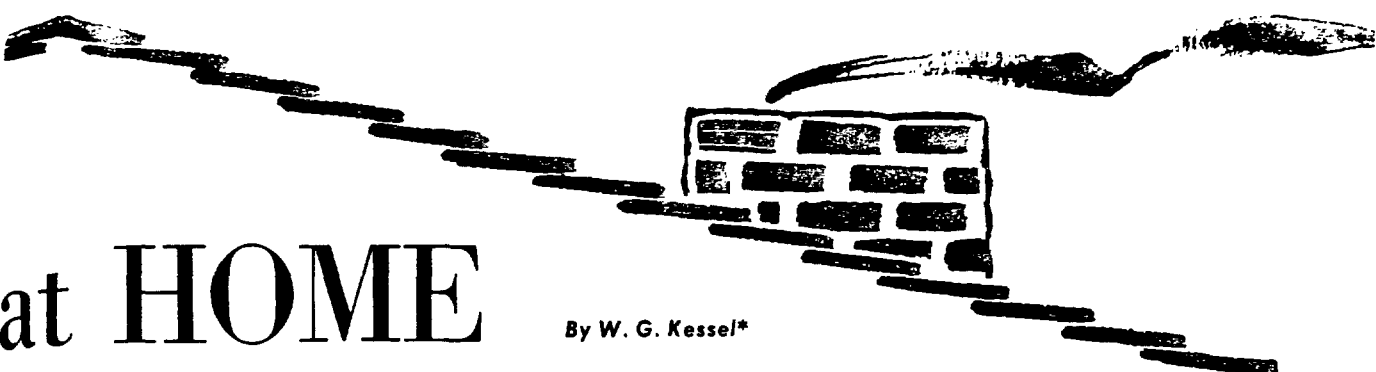
"I don't see why anybody wants to be a chemist. It makes more sense to take business courses."

"Don't ask me what a molecule is. Look it up!"

"All this work on atomic energy will get us into a big war."

"Ask your teacher," or "Ask your scoutmaster—I don't know."





at HOME

By W. G. Kessel*

"Why are they always teaching new ways of doing things? Can't they do them the way we used to?"

"I hated algebra, and geometry was worse."

"Why wonder about cosmic rays? They're only something up in the sky."

"Go to the meeting at school tonight? Not me!"

Countless other statements could be cited which only stifle a child's curiosity, increase his prejudices, develop his superstitions, create intolerance and bigotry, and result in complete apathy and lack of respect for science and other fields of knowledge.

Too many children lose their healthy curiosity concerning natural phenomena before they reach high school. Surely, parents are partly responsible for smothering this normal and highly desirable trait.

What are some of the attitudes parents can assume and some of the contributions that the home can make which will facilitate interest and enthusiasm for a scientific career?

Parents Can Further Thinking

Most people are aware that a scientist is an individual who wants to know the how, the why, the where and the what of things in the world around him. Parents can further such thinking by giving youngsters assistance in terms of answers, discussions, books, equipment and experiments (if feasible) of suitable kinds.

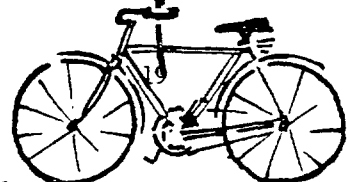
Children can be helped in planning a project and developing it by making careful observations and recording results. Youngsters face many problems where such a program of elementary "research" would be of great value, not only at the present time, but in generating positive attitudes and abilities essential when the time is ripe to undertake bigger projects in the years ahead.

By precept and example, mothers and fathers can inculcate in children the importance of objective information rather than subjective comments. It can be made clear and convincing that the solution of a specific problem depends upon an impersonal, unprejudiced and logical approach.

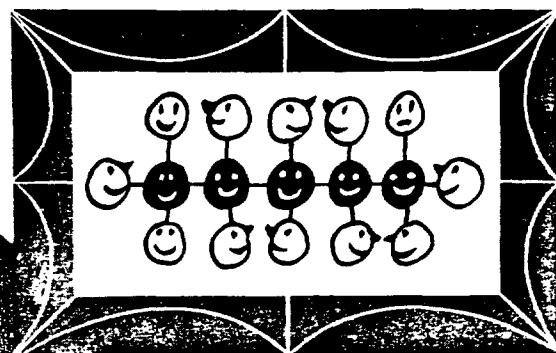
Adult Influence Important

Intelligent adults are aware that there is a considerable difference between fact and opinion, but boys and girls have to learn. They must be taught to recognize propaganda, misstatements, pseudo-statics and suggestions by innuendo. Parents should give evidence of respecting expert opinion; revising conclusions if the final evidence warrants; and properly examining and evaluating new ideas.

Fathers and mothers unable or unwilling to shoulder such responsibilities will have a negative influence in developing in their children a scientific attitude which can lead to lasting interest in and enthusiasm for various technical fields. Teachers can do part of this job, but parents must initiate, supplement and follow through with their share of responsibility for directing the nation's youth toward science. #



PORTRAIT OF A MOLECULE



Selected and tailored hydrocarbons are used to make good gasoline

GASOLINE IS A CONTRADICTION. It is composed almost entirely of two of the most common elements in nature—hydrogen and carbon. Yet it is one of the most complicated chemical substances. It would take years to explore fully the many different molecules in a gallon of gasoline.

Although scientists do not know exactly the numbers and kinds of all the molecules in gasoline, they do understand their nature. They know that the carbon and hydrogen atoms of gasoline molecules are arranged in many different but definite patterns.

The marriage of carbon to hydrogen to make hydrocarbons is a remarkable mating. Hydrogen is a great source of heat. Each pound can produce about 60,000 British thermal units (BTU's). Carbon, too, is a good heat producer, with 14,500 BTU's per pound. Combined, as in gasoline, these two elements produce hydrocarbons averaging about 20,000 BTU's per pound.

TNT contains less than one-third as much heat

energy per pound; nitroglycerine only one-sixth as much. Obviously, in the explosives, the destructive energy comes from combustion characteristics rather than from heat content alone.

Without the great hydrocarbon deposits that are crude petroleum, man would have to manufacture gasoline and other liquid fuels from other sources of hydrogen and carbon. As it is, he fashions gasoline by selecting and tailoring the hydrocarbon molecules provided by nature in crude oil.

As Charles F. Kettering has pointed out, "We don't go to a mine and expect to find iron in the form of Cadillac crankshafts. Why should we go to crude petroleum and expect to find molecules of the size and shape best adapted to the internal combustion engine?"

The answer, of course, is that today's refiner doesn't expect to find crude petroleum in a form he can market. But he has learned to make a highly marketable product from it.

Petroleum chemists have seen few, if any, hydrocarbon molecules, even with electronic microscopes, yet they know what the molecules look like. The simplest is methane, or marsh gas (CH_4)—in which four atoms of hydrogen are bonded to one atom of carbon.

In general, hydrocarbons containing the lowest number of carbon atoms are gases, such as methane, ethane and propane. In the middle ranges, with more atoms in the molecule, hydrocarbons usually occur in liquid form at room temperature. Those containing the largest number of atoms are solids—like waxes or asphalt.

What's in Gasoline

Gasoline is largely composed of hydrocarbon molecules containing from four to nine carbon atoms, with traces of both lighter and heavier hydrocarbons dissolved in them. If there are fewer than five atoms of carbon, the substance is ordinarily a gas at room temperature. However, gases such as butane (four carbon atoms) will remain dissolved for reasonably long periods and are used for improving the quick-starting characteristics of gasoline.

So far, several hundred gasoline hydrocarbons have been isolated or manufactured in a pure state. Thus, it would appear relatively simple for a refiner to manufacture only those he wants. In actual practice, the oil industry has to segregate or manufacture from crude oil the most desirable kinds of gasoline hydrocarbons in the greatest quantity, but without regard to their precise molecular composition or arrangement. Millions of dollars already have been spent in developing amazingly successful processes and equipment. Even so, the effort continues unabated to find still better ways of manufacturing gasoline hydrocarbons.

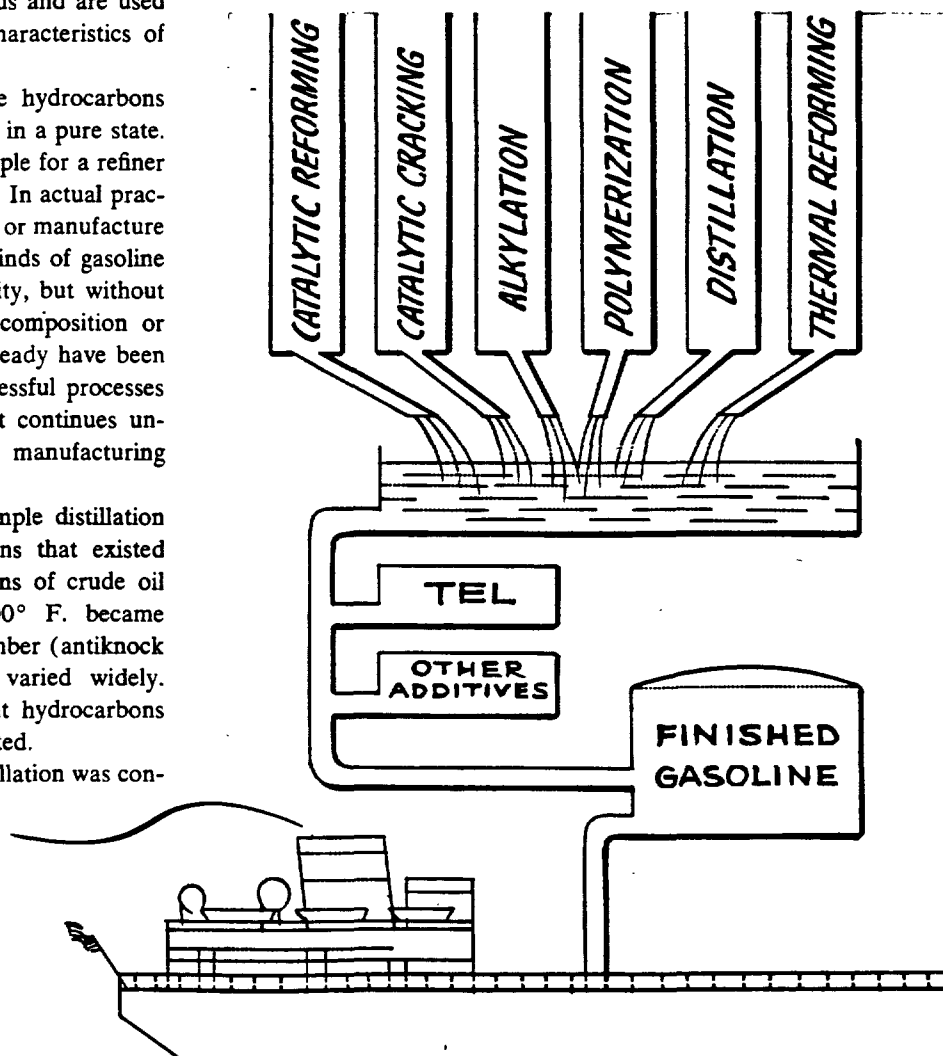
In the early days of refining, simple distillation separated the gasoline hydrocarbons that existed naturally in petroleum. The portions of crude oil which boil between 90° and 400° F. became straightrun gasoline. The octane number (antiknock quality) of straightrun gasolines varied widely. Moreover, the supply of these light hydrocarbons suitable for gasoline was quite limited.

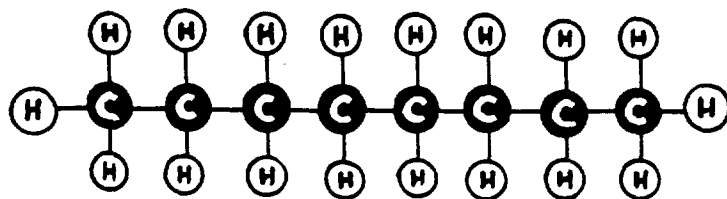
In 1900, for example, simple distillation was con-

verting about 10 percent of a barrel of crude oil into gasoline. This was enough to meet the demands of the times. By the time World War I came along, however, there were not enough gasoline hydrocarbons in most crude oils to meet the growing demand. Research on the problem led first to the development of thermal cracking.

Thermal cracking subjects the heavier portions of the crude oil, such as kerosene and heavy fuel oils, to pressures approaching 1,000 pounds per square inch and temperatures in the neighborhood of $1,000^\circ$ F. Under these conditions the large hydrocarbon molecules were "cracked" into smaller ones suitable for gasoline, and the yield of gasoline from crude oil was increased considerably.

Since then, a succession of new refining methods has brought countless new hydrocarbon molecules within reach of refiners—and in volume. It was by intensive study of the antiknock characteristics of these manufactured hydrocarbons that refiners came to use the proper types for gasoline.





1 A PARAFFIN NORMAL OCTANE

There are four principal types of gasoline hydrocarbons. They are known as paraffins, naphthenes, olefins and aromatics. A typical example of each is shown in Figures 1 through 4.

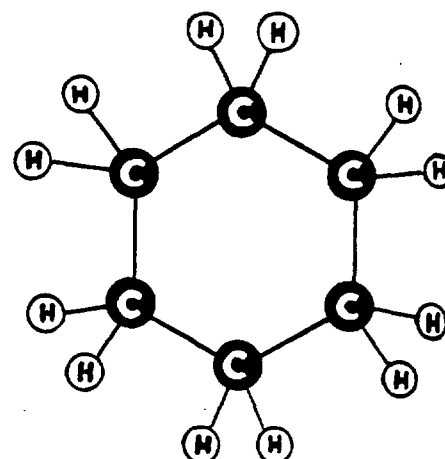
Regardless of type, hydrocarbons have one characteristic in common—the greater the number of carbon atoms in the molecule, the heavier the molecule and the higher its boiling point. When it comes to antiknock quality, the size and weight of the molecule is not nearly so important as the arrangement of its carbon and hydrogen atoms.

In the case of the paraffins, for example, the heavier the molecule, the lower its antiknock quality. Normal octane, with eight carbon atoms and 18 hydrogen atoms, arranged as in Figure 1, has an octane number of less than 0. If the same number of carbon and hydrogen atoms is rearranged, as shown in Figure 5, the resulting compound, iso-octane, will have an octane number of 100.

Oxidation Inhibitors

Olefins resemble paraffins except that they have two less hydrogen atoms and contain one chemical "double bond" between two of the carbon atoms. Usually, olefins are higher in antiknock quality than their corresponding paraffins but they are not as stable. In order to use any substantial quantity of the olefins in gasoline, it became necessary to develop suitable oxidation inhibitors. Otherwise, undesirable gummy substances would form.

Petroleum refiners not only have perfected processes for manufacturing gasoline hydrocarbons from heavier materials, but also have found ways of converting gases to liquid hydrocarbons suitable for gasoline. Polymerization and alkylation both are processes in which gaseous hydrocarbons most generally containing from three to five carbon atoms



2 A NAPHTHENE CYCLOHEXANE

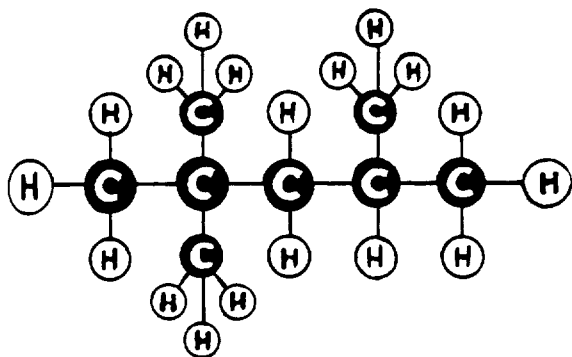
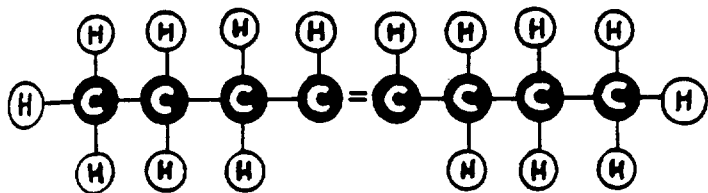
are combined to form somewhat heavier compounds for use in gasoline.

The present-day demand for very high antiknock quality hydrocarbons has brought the use of catalytic reforming into extensive use. The value of catalytic reforming is apparent in the following example: Assume that a refiner segregates a 40 octane number straightrun gasoline fraction which boils between 200° F. and 400° F. Upon exposure to certain precious-metal catalysts at the proper temperatures and pressures, about 85 percent of the original straightrun gasoline fraction (low octane naphtha) can be recovered as 85 octane gasoline or blending stock. The addition of tetraethyl lead will raise this reformed gasoline to about 95 octane number.

As a general rule, refiners balance the relatively high cost of obtaining octane numbers by severe catalytic reforming against the cost of the same octane numbers provided by tetraethyl lead. In actual practice it usually is less expensive to obtain the final octane numbers by TEL than by severe catalytic reforming since the latter entails a high loss of product to gas and greater costs for the operation of the reformer.

No modern commercial gasoline, of course, is a product of any one refining process. This would be both expensive and wasteful. Instead, a variety of hydrocarbon types are blended together from sev-

3 AN OLEFIN OCTENE

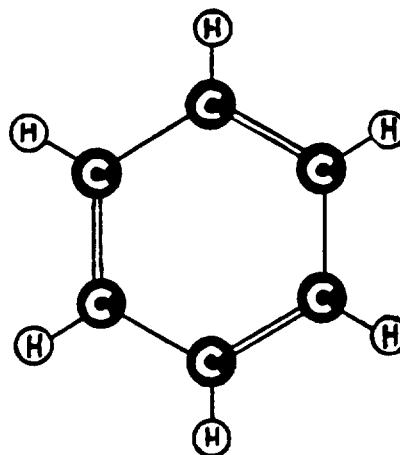


5 A PARAFFINIC ISOMER ISOOCTANE

eral different refining processes because the finished gasoline must meet many requirements for satisfactory performance in engines.

The accompanying table summarizes the requirements a good gasoline must meet. Meeting these requirements is particularly challenging because of the variables in automobile engines. Some engines have the greatest tendency to knock at low speeds; others at high speeds. Engines also vary in their octane requirements because of differences in age, design, mechanical condition and type of service to which they are put.

The major aim of the oil industry is to produce gasoline that will provide the best performance for the greatest number of cars. By studying the structure of hydrocarbon molecules and by learning how to rebuild them, the industry through the years has been able to provide gasoline of constantly better quality and in ever-increasing quantities. Judging by the work that the oil industry is now doing, even greater progress may be expected in the future. #



4 AN AROMATIC BENZENE

Requirements for GOOD GASOLINE

CHARACTERISTIC	REASON
Evaporate readily at low temperature.	For quick starting.
Evaporate in ever-increasing quantities as temperature rises.	For fast warm-up, smooth acceleration and proper fuel distribution among the cylinders.
Vapor pressure-distillation relationship suitable for the climate and altitude in which the gasoline will be used.	To prevent vapor lock and the boiling of gasoline in carburetors, fuel pumps and fuel lines. Also to prevent excessive evaporation losses from gasoline tank vents.
Minimum of excessively high-boiling materials.	To insure good fuel distribution and freedom from crankcase dilution and deposits.
High in heat content per gallon.	To give maximum miles per gallon.
High antiknock quality (octane number) at all speeds.	Freedom from fuel knock (detonation).
Low in gum content.	To prevent valve sticking, carburetor difficulties, lacquer formations in engines and dirty intake manifolds.
Low in sulfur content.	To prevent corrosion and wear.
Good stability.	To prevent deterioration and gum formation in storage.
Satisfactory odor.	Public acceptance.



Glenn O. Hayes

G. O. Hayes Directs Employee Relations

GLENN O. HAYES, formerly resident manager of Ethyl Corporation's manufacturing plant at Houston, Texas, has been named to the newly created position of director of employee relations for the Company, with headquarters in New York. Curtis R. Holton, formerly director of industrial relations, has resigned to form his own consulting firm.

The functions of the newly organized Employee Relations department will include labor relations, employee training, wage and salary administration, employee benefits, suggestion system and personnel research. Employee Relations will act as a service department for the entire Company. At Ethyl's Baton Rouge Plant, it will be represented by W. J. Henry, and at the Company's Houston plant by D. J. Kennedy.

Melvin C. Hudgins was appointed resident manager of Ethyl's Houston plant, succeeding Mr. Hayes, and Jasper F. Kobler was named assistant resident manager. Mr. Hudgins was formerly assistant resident manager and Mr. Kobler was general superintendent of maintenance. #



A. Clarke Burdick, Jr.

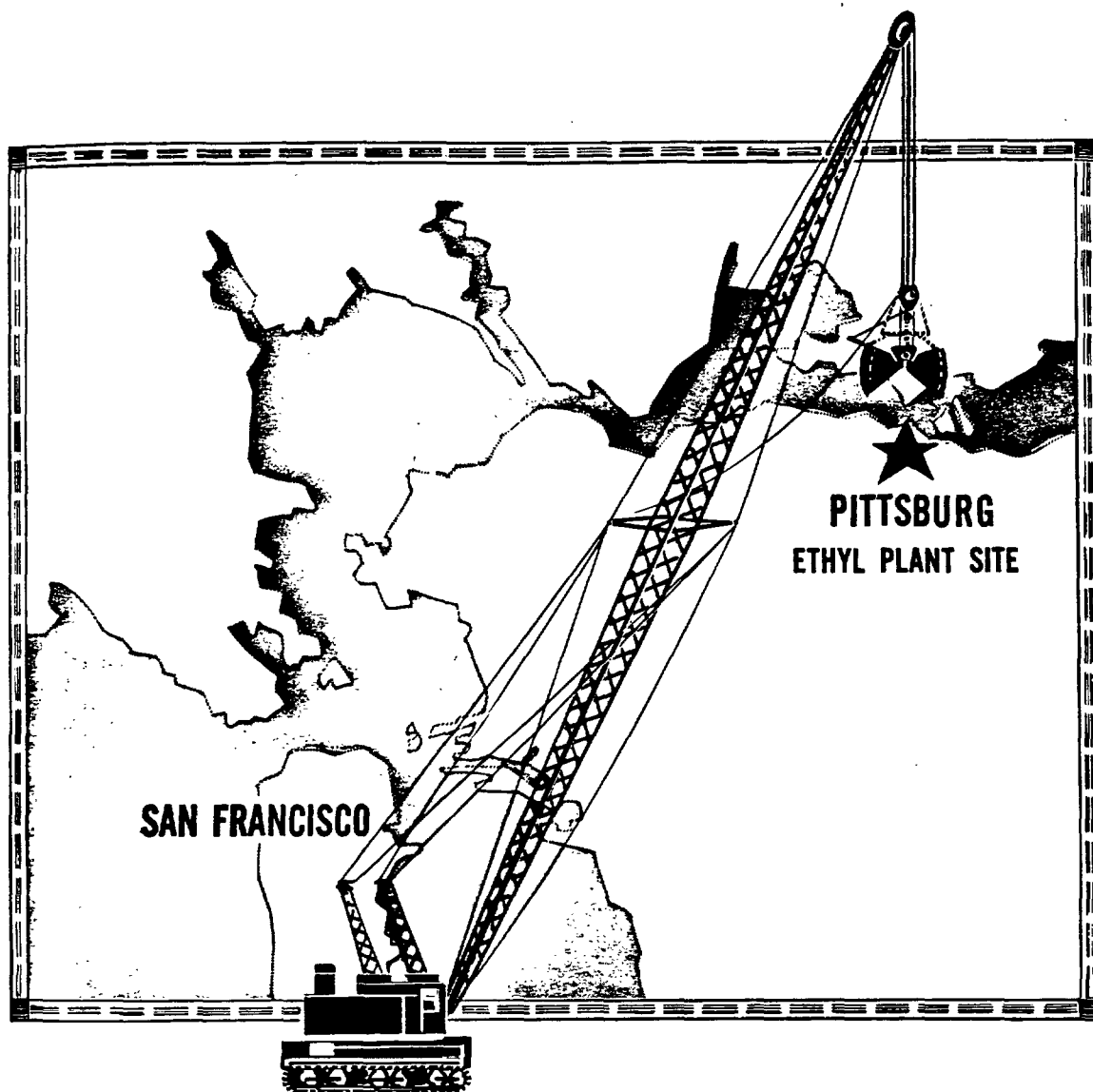
A.C. Burdick, Jr., Heads New Engineering Dept.

A SEPARATE Engineering Department has been formed in Ethyl Corporation.

The new department, which performs the general engineering and construction coordination functions formerly carried out by the Research and Engineering department, is headed by A. Clarke Burdick, Jr., as chief engineer. G. S. Roberts, director of general engineering, and J. B. Rhorer, superintendent of construction coordination, are on Mr. Burdick's staff.

The new department was organized because of the enlarged scope of the Ethyl's research and development effort as well as the construction planning made necessary by the Company's continuing expansion program. The new departmental organization will permit integration of plant general engineering and construction functions and at the same time free Ethyl's research staff to concentrate exclusively on research and development programs.

The name of the Research and Engineering department has been changed to the Research and Development department, under the direction of Dr. George F. Kirby, Jr., Ethyl vice president. #



Clear Site for California Plant

THE SITE in Pittsburg, Calif., where Ethyl Corporation's newest antiknock compound manufacturing plant will be built, is now being prepared for construction work. Actual building is scheduled to begin in March upon completion of the site preparation. The plant, which will serve the needs of the West Coast oil industry, is expected to be finished by the middle of 1958.

The new installation will be located on a site in Pittsburg adjoining the Dow Chemical Company plant, and will be convenient to rail and water transportation. Its principal features will include a cen-

tral process building for the manufacture of antiknock compounds, a shops and stores building, a steam generating plant, an administration building and storage facilities.

The Pittsburg plant will be the fourth in the United States and Canada for the manufacture of "Ethyl" antiknock compounds, and the third built since 1952. Ethyl, the world's largest producer of antiknock compounds, now has plants at Baton Rouge, La., and Houston, Texas. Last September, a subsidiary, Ethyl Corporation of Canada Limited, put into operation a plant at Sarnia, Ont. #



ETHYL'S FUEL-ENGINE RESEARCH ORGANIZATION IS CENTERED HERE IN DETROIT, MICHIGAN

The 8,614,000,000 horsepower of all automotive engines in the United States today testifies to the continuing progress of *both* the oil and automotive industries. Ethyl Corporation is proud to have contributed to this progress for thirty-four years.

ETC 30605

July News

MARCH 1911



ETC 30606

Ethyl News

MARCH - APRIL 1957



THE COVER: A garden in the Governor's Palace at Williamsburg will be among the points of interest visited this year by tourists who want to recapture the life and times of our country's first settlements in Virginia and New England. For the story of planned attractions, see "History Comes to Life," beginning on page 1.

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ETC 30607

History Comes to Life

**In Virginia and Massachusetts great programs
of restoration and pageantry are providing
a realistic recreation of colonial times**

A NEW APPRECIATION of how our founding fathers lived and the hardships they endured in their determined quest for freedom will be gained by millions of Americans this year.

In two historic East Coast areas, memorable scenes and events from colonial times are being brought back to life authentically on a huge scale. In the Jamestown-Williamsburg-Yorktown section of Virginia and at Plymouth, Mass., elaborate programs and projects are recreating the life and times that led to the birth of the United States.

350th Anniversary of Jamestown

In Tidewater Virginia, the 350th anniversary of the founding of Jamestown, first permanent English settlement in North America, is the focal point of a \$25 million program of restoration and pageantry. The sponsors are the Commonwealth of Virginia's 350th Anniversary Commission and the Federal government's Jamestown-Williamsburg-Yorktown Celebration Commission. They are being assisted by the National Park Service and the Association for the Preservation of Virginia Antiquities. These groups have worked tirelessly for more than two years to turn back the pages of history realistically





The entrance to the reconstructed James Fort of 1607 at Jamestown, Va. Visitors are shown the interior of the stockaded fort by costumed guides.

and provide accommodations for the 3,000,000 visitors they expect in the area during the eight-month period starting April 1.

Six miles from Jamestown is the reconstructed capital, Williamsburg, where colonial life came to full bloom. And it's only another 12 miles from Williamsburg to Yorktown where the surrender of British forces under Cornwallis ended the Revolution and assured American independence.

Plenty to See

Thanks to the work of the present cooperating agencies and previous restoration efforts, there's almost no end of sights to see in this history-drenched area.

At Jamestown, archeologists, historians, builders and display experts literally have left no stone unturned to recreate life as it was in the early 1600's. In a 32-acre park and exhibit area, visitors can see a Powhatan Indian lodge complete with redskins. A reproduction of the settlers' log fort, with its armament and soldiers, stands guard on the bank of the James River. In the water are full-size reproductions of the *Susan Constant*, the *Godspeed* and the *Discovery*, sailing vessels that brought the colonists from England.

Also on display are excavated ruins of the first settlement, an original graveyard, replicas of homes, glass furnaces and other shops, and, in permanent exhibition buildings, hundreds of original tools, weapons, trinkets and household items.



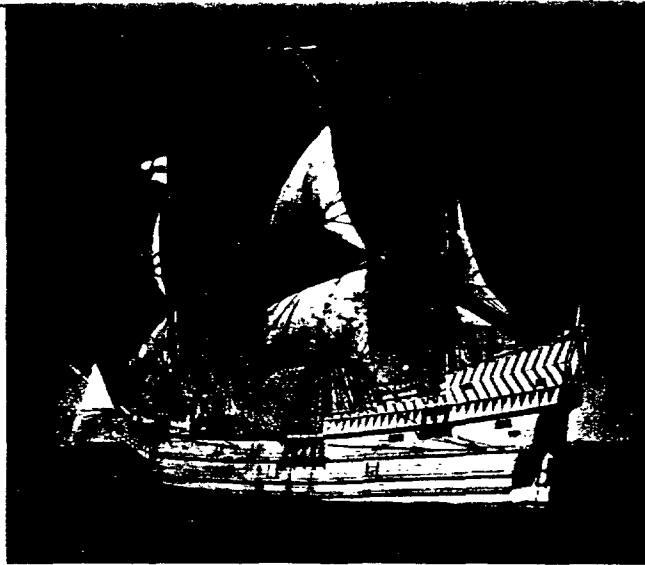
At the reconstructed Glasshouse, artisans shape articles just as they did in the early 1600's.

Across the peninsula from Jamestown, where the York River enters into Chesapeake Bay, is once-strategic Yorktown. There the Revolutionary battlefield, with its overgrown trenches, old cannon, and Surrender Room in the Moore House beckon visitors. This year, some of the military maneuvers of the original battle are being re-enacted by young men dressed in the uniforms of Colonial and British soldiers and sailors.

There, too, relics retrieved from sunken British ships and a reconstructed section of such a ship are on display at the museum. So are weapons, implements and other mementoes of that historically decisive battle area.



The old Jamestown church tower, built in 1639, stands on the site of an earlier frame church.



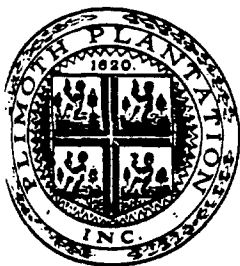
Replicas of the *Susan Constant*, above, the *Discovery* and the *Godspeed*, the three ships that brought settlers to Virginia in 1607, ride at anchor in the James River.

Williamsburg, well-known reconstructed capital of colonial Virginia and long a tourist mecca, is the third attraction of the historical triumvirate. It is readily accessible from both Jamestown and Yorktown by the new Colonial Parkway and multiple-lane highways. In Williamsburg, red brick and white clapboard homes, government buildings, military installations, shops, taverns and churches of the 1700's, are surrounded by picturesque yards, gardens and pin-neat streets. In these surround-

ings, authentically costumed men and women relive life as it was in the 18th century.

To provide for the great extra influx of visitors this year, an \$8 million reception center with two theaters, a motel and a cafeteria has been put in near the reconstructed area.

Additionally in Williamsburg this year, two spectacular open-air dramas are being staged by The Jamestown Corporation, a state-sponsored theatrical group. *The Founders* realistically portrays in a great



Below, a costumed Pilgrim family at the threshold of a reproduction of a Plymouth home of the 1620's . . . Right, an artist's rendering of the *Mayflower II*.



ETC 30610

outdoor setting the development of the Jamestown colony in the trying decade from 1609 to 1619. The second extravaganza, *The Common Glory*, dramatically depicts the struggle for independence waged by American colonists in the next century.

While 17th and 18th century life are being relived in Virginia, events none-the-less historic are being recreated in Massachusetts. At Plymouth, late in May, is scheduled to arrive an English-built replica of the *Mayflower*, the ship of "180 tons burden" which brought the Pilgrims to the now-famous Rock in 1620. Built and fitted out by the people of Britain as a goodwill gift to America, the *Mayflower II* is following the original route from Plymouth, England.

Shrine of Americana

Arrival of the tiny craft will be marked by elaborate welcoming ceremonies. Then the ship will become the center of attraction in a shrine of Americana on which work already has started. On a 100-acre tract, two miles south of Plymouth Rock, a replica of the Plymouth of 1627 (the year of the first "census") is being built. Sponsoring organization is "Plimoth Plantation, Inc.," a non-profit group dedicated to the preservation of the "magnificent Pilgrim heritage."

At this permanent shrine, in the lee of the *Mayflower II*, just as they did more than three centuries ago, men and boys in Pilgrim garb will work in the saw pit and the gardens, at the grist mill and the

brick kiln, using tools of the times. Women and girls will spin, weave, churn, dip candles in the ways of Pilgrim housewives. Sheep and goats will graze on the nearby meadows.

The reconstructed Pilgrim village will include realistically furnished thatched dwellings, the fort-meeting house, an Indian village and trading post, and an archeological museum displaying relics that have been gathered from throughout the area.

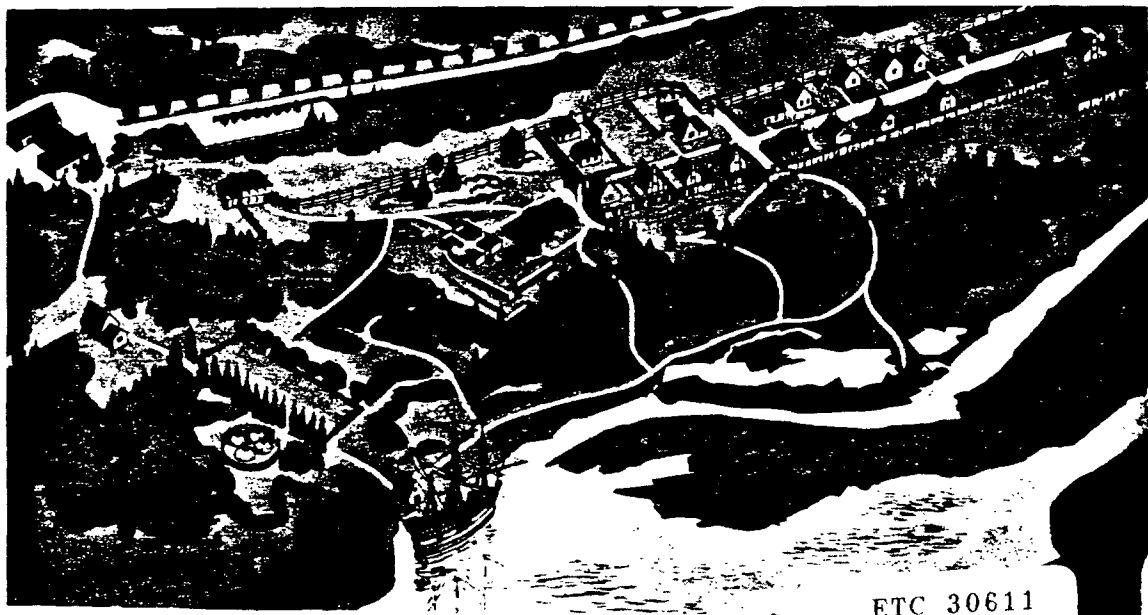
Recreation Well Underway

With the *Mayflower II* en route across the Atlantic and construction of "Plimoth Plantation" started, this recreation of colonial history is well on its way. Later this year, a Thanksgiving program will be held at the Plantation.

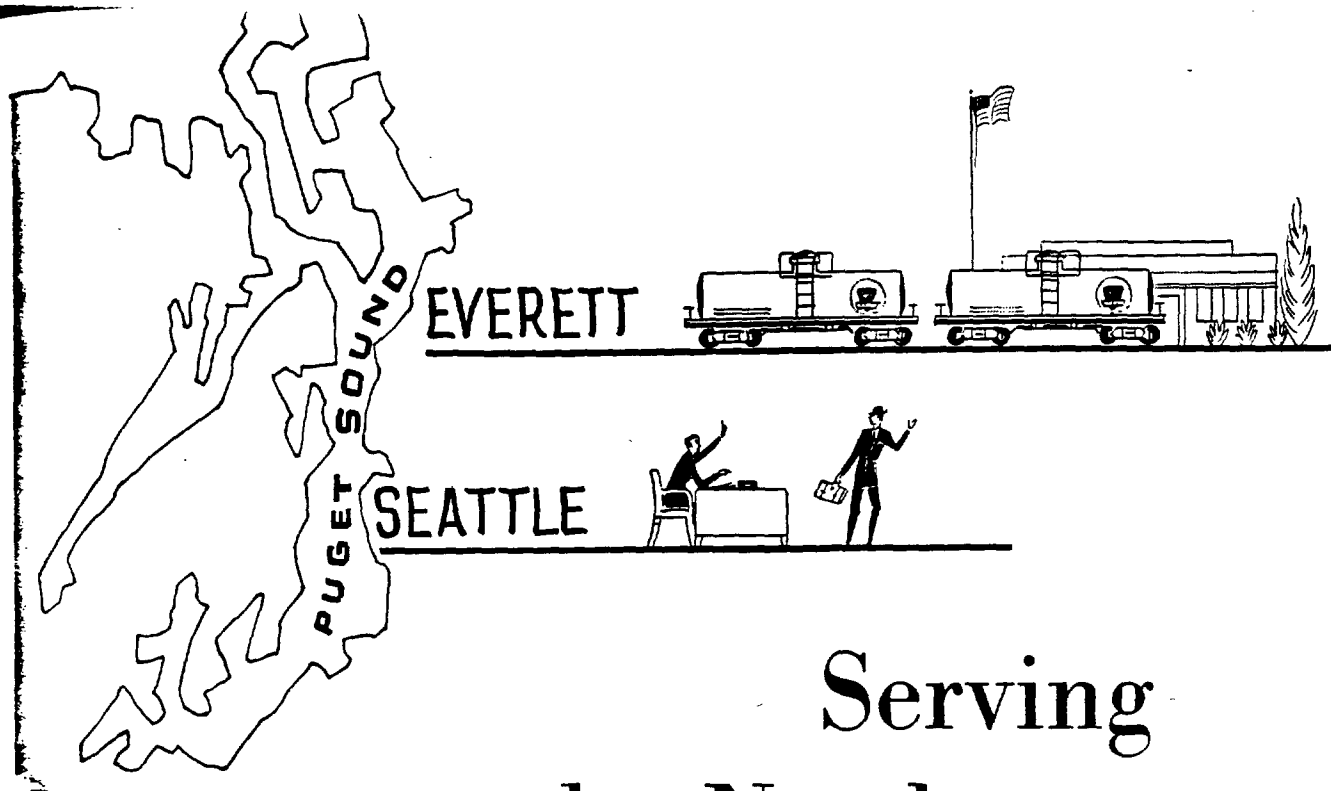
During 1958, the *Mayflower II* will be moored at its permanent berth and the Pilgrim village will be completed. Meanwhile, as construction of the various elements of the project is under way, visitors are being admitted to the site to see the work being done and the progress being made.

Looking back, as they do, to early American life, the historical recreations—in Massachusetts and Virginia—give an unprecedented element of realism to our history. Coming at a time when freedom and liberty are suppressed in much of the world and often not fully appreciated here in the United States, they also can help impress on Americans what our forefathers endured to "secure the blessings of liberty for (themselves) and their posterity."#

The *Mayflower II* and a Pilgrim village will be included in the historical exhibit being built on a 100-acre tract at Plymouth, Mass., by "Plimoth Plantation, Inc.," a group dedicated to preserving the Pilgrim heritage.



ETC 30611



Serving the Northwest

New Ethyl office and terminal will supply refiners' needs in fast-growing area

WITH A CAPACITY that is scheduled to expand from 89,000 to 200,000 barrels a day in the next few years, the Puget Sound area of Washington is one of the fastest growing refining centers in the United States.

Well aware of the requirements of refiners in such an area, Ethyl Corporation already has taken steps to expand its facilities to serve them. On April 1, the Company opened a new district office in Seattle, and more recently has announced plans to build a distribution terminal at Everett, Wash. These new additions to Ethyl's nationwide organization are designed to provide expanded antiknock compound services for existing and projected refineries in the Pacific Northwest.

The new Ethyl office in Seattle will be headed by Edward E. Muller, who has been named district

manager. Mr. Muller has been associated with Ethyl for 20 years. He has had extensive experience in all phases of sales and product service work for the Company in New York, Georgia and Texas. Immediately before his recent promotion, he was located in the Beaumont, Texas, area.

While Ethyl representatives from the Seattle district office are working closely with refiners locating and expanding in the Puget Sound area, the refineries themselves can be supplied with "Ethyl" antiknock compounds from the new distribution terminal at Everett. A convenient supply point, the terminal will be designed to receive Ethyl products by rail and distribute them by tank truck.

The terminal is scheduled to be completed this summer. It will be located on property leased from the Port of Everett and will be served by the Great Northern Railroad.

Refiners on Puget Sound, as well as others throughout the entire Pacific Coast area, will be supplied with antiknock compounds manufactured at the Ethyl plant at Pittsburg, Calif., when that plant goes on stream next year. #

Edward E. Muller,
District Manager, Seattle





Service and Safety at Work

**An experimental mixing plant is
latest project in Ethyl engineers'
broadened scope of activities**

AS THE LATEST STEP in its continuing efforts to develop better ways for oil companies to unload, store and use "Ethyl" antiknock compounds at refineries, Ethyl Corporation is building an experimental mixing plant. The new facility, which will be located at Ethyl's manufacturing center at Houston, Texas, will be a proving ground where new methods, instruments and equipment for improving mixing plant operations will be developed, tested and evaluated. It also will be a valuable center for training personnel in the safe and efficient handling of antiknock compounds with the most advanced facilities.

At the experimental mixing plant, Ethyl engineers will test all types of pumps and other devices, as well as methods for fluid motivation. They will investigate and evaluate devices and equipment for accelerating the unloading of tank cars and drums of antiknock compounds and will test and develop equipment and systems for measuring "Ethyl" fluid and proportioning it into gasoline.

Will Experiment with Dye

Plans call for the testing of safety devices and procedures, and, where feasible, changes in line connections, fittings, tank cars and drums. Experi-

Left, using a lead-in-air analyzer, an Ethyl product service and safety engineer tests an air sample taken from inside a gasoline storage tank.



Right, Ethyl engineers keep in close touch with refinery operating personnel who work with antiknock compounds and gasoline.

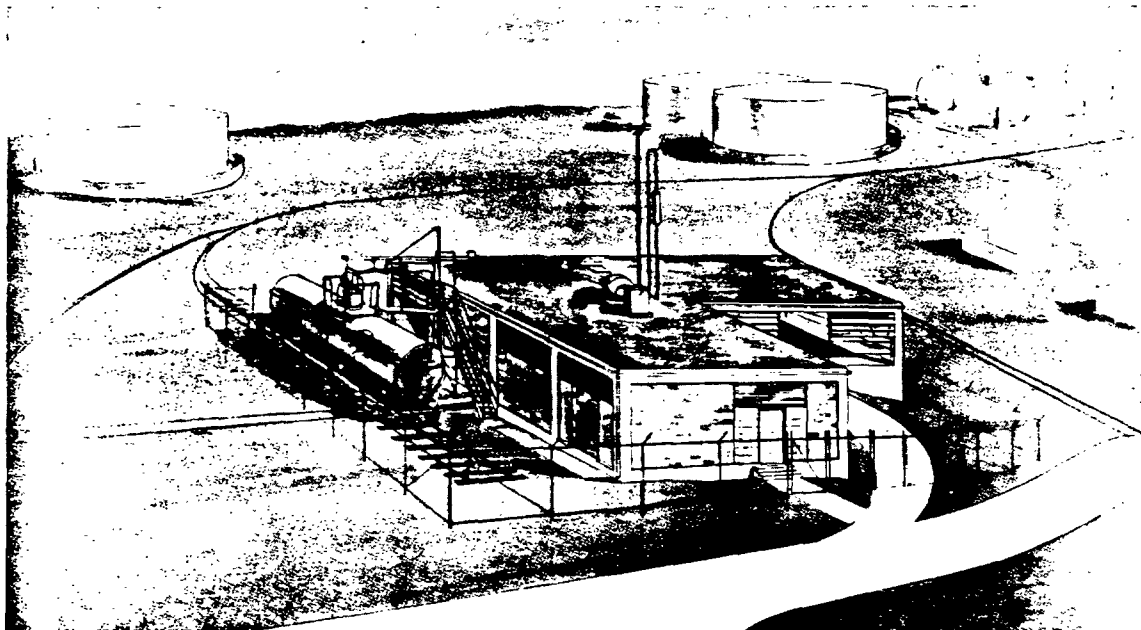
ments also will be made with proposed methods for adding dye to gasoline.

The experimental mixing plant will include a weigh tank for storing "Ethyl" fluid, drum unloading facilities and a testing area. There also will be the necessary gasoline tanks, a reserve storage tank for fluid and a railroad spur track. At Houston, the extensive knowledge and experience of Ethyl's

Research and Development, Engineering and Manufacturing departments in fluid handling and measuring will be readily available.

Construction of the blending plant is another project in the broadened scope of activities of Ethyl's Product Service and Safety group, formerly known as the Safety department. The name of this group was changed recently to indicate more accu-

An architect's sketch of the experimental mixing plant being built at the Ethyl manufacturing plant in Houston.



rately the enlarged scope of its varied operations.

While the primary responsibility of these engineers has been and is the handling of "Ethyl" fluid in the field, they also have designed antiknock compound mixing plants, improved operations, and assisted in maintaining refinery mixing plants at peak operating efficiency.

Among their many contributions to the improved handling of antiknock compounds and leaded gasoline is a new method for transferring fluid from tank car to mixing plant. Known as Fluid Flow Control, this procedure involves the use of a new simple installation which results in shorter unloading time with complete safety and improved efficiency.

Check for Tank Defects

In another phase of their work they have made extensive studies of weigh tank testing and corrosion problems and have introduced a new radiographic technique for checking localized defects in tanks.

In their study of mixing plant weigh tanks, the product service and safety engineers have developed a new tank design. This design standardizes on the diameter, width and thickness of steel shell plates and tank heads that go to make up all tanks regardless of size. To secure different volumes, a

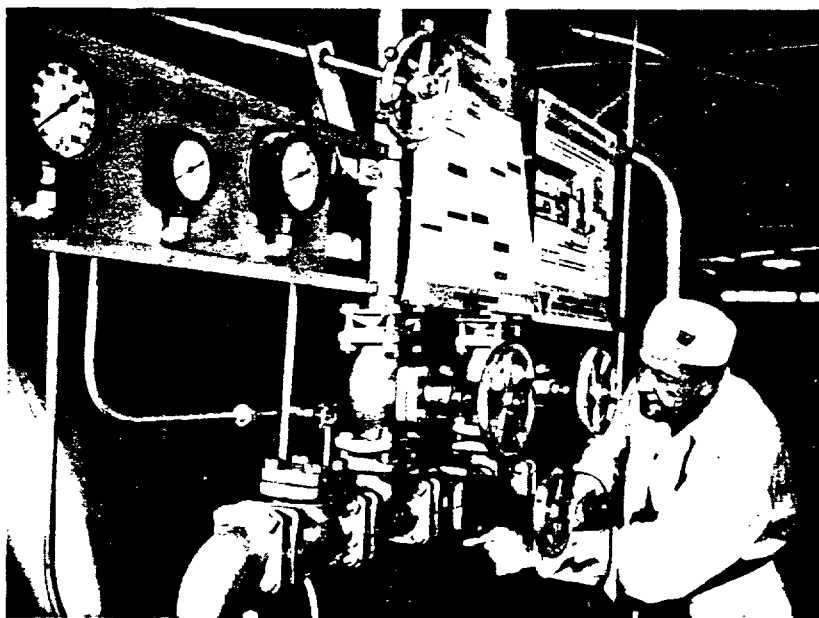
combination of standard width plates is used, i.e., a 4,400-gallon tank uses one standard width plate, whereas 8,000, 11,000 and 15,000-gallon tanks use two, three and four plates, respectively.

Despite constant increases in the cost of steel plate, this standardization of common diameter tank heads and shell plates and modifications in mountings makes it possible for Ethyl to supply refiners with better equipment at no increase in cost.

Observe Tank Cleanings

The work of the Ethyl product service and safety engineers does not stop here. They observe the cleaning of hundreds of leaded gasoline storage tanks every year, acting in an advisory capacity. These engineers have made numerous improvements in tank cleaning methods and have assisted the oil industry in achieving its excellent safety record in this operation.

Ethyl also conducts a comprehensive and continuing program of safety education. In this program, the Company's product service and safety engineers prepare and distribute booklets, brochures, instruction charts and motion pictures, conduct training meetings and maintain contacts with refinery operating people who work with "Ethyl" antiknock compounds and leaded gasoline. #



Periodic maintenance inspections by Ethyl product service and safety engineers help refiners keep mixing plants in safe, efficient operating condition.



High school students from Red Bank, N. J., visiting the Sinclair tanker M. L. Gosney in New York.

Classrooms Ahoy!

Ship "adoptions" help youngsters learn more about the American merchant marine

By Stanton P. Nickerson

D ID YOU EVER go through a hurricane? What is a bulkhead for? Which is better, a steam engine or a diesel? Can you carry gasoline and kerosene at the same time on the same tanker? How long does it take you to sail from Houston to Boston?

In coastal cities and towns, where the sea is a way of life, boys and girls have asked such questions for generations. But today, the same queries are being raised by youngsters living in the heart of the corn belt and high in the Rockies.

Thanks to a unique educational and public relations program sponsored by the maritime industry, youthful curiosity about shipping is being satisfied by the captains of vessels crisscrossing the world.

In answering hundreds of questions, the program is creating a better understanding and appreciation of why men go down to the sea in ships, and what their work means to the welfare and progress of America. A dividend to the oil industry is emphasis on the importance of petroleum and tanker transportation.

Children get first-hand information about commerce afloat when they "adopt" a ship for a school year. Largely by corresponding with the captain and his officers, boys and girls learn far more about shipping than from textbooks alone.

Most of the arrangements for the "Adopt-a-Ship" program are handled by the Women's Organization for the American Merchant Marine, Inc. It sets up working contacts between ship owners and schools,

and coordinates the program's operations and administration.

Inspired by similar plans in Europe, marine adoptions were started on this side of the Atlantic during the middle 1930's. Only a handful of ships and schools participated at first, but when the project was revived after World War II, 60 vessels enrolled. Increasing oil industry cooperation, coupled with the enthusiastic endorsement of educators and pupils, has helped boost the total to 270 ships of 22 companies today. Even so, many more ships are needed before the next school year begins.

Tankers Adopted

Nearly 12,000 children from 265 schools in 35 states are now foster parents of every kind of commercial bottom. They have adopted powered river barges, ore carriers, coastal and deep sea freighters, reefers, trailer-truck transports and of course the nation's largest and sleekest liners. Of all the adopted ships, about 20 percent are tankers.

There is usually a liberal exchange of personal information during a "getting acquainted" stage. Boys and girls want to know about the captain's home and family, his interests and hobbies, his early life and career, and similar news about other ship's officers. Pupils in turn send their adopted ships compositions about themselves, school activities and local events.

Exchanging snapshots between those at sea and vicarious mariners ashore helps everybody become better acquainted. In due course, schools receive pictures of life afloat, loading and unloading operations and sometimes views of the wells and refineries which supply tankers with their cargoes.

An astonishing variety of questions is asked as the adoption progresses. They range from simple inquiries from fifth graders about the vessel's size, draft, speed and routes to more complex informa-

tion requested by high school students, who want to know about navigation, engines, port regulations and even the fundamentals of international maritime law.

Many tanker captains convey information in language children can understand easily. Skipper David Rosen of Texaco, for example, told a small mid-western school that their *SS Indiana* can carry 107,000 barrels of gasoline—"and if that were milk, and if all 30 of you drank a quart every day, you would need 1,650 years to finish it."

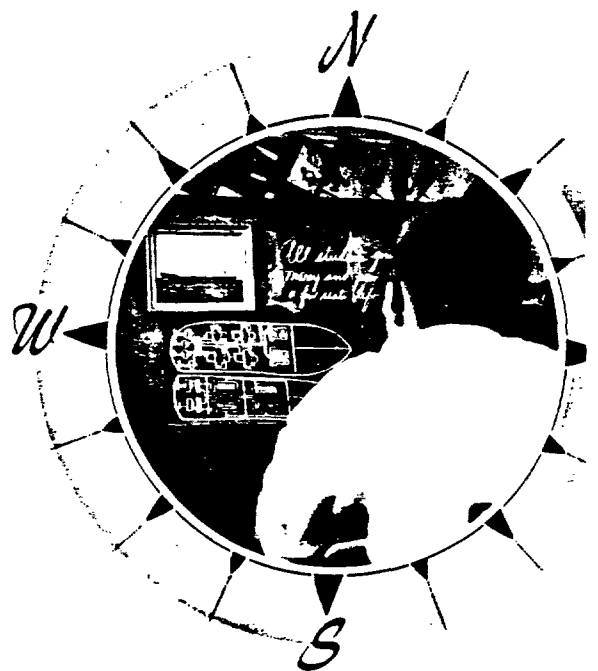
Other letters help generate pupil initiative. After describing a drydock overhaul, a tanker captain wrote to a high school class "... Of course I have used some terms you may not understand, but just look them up in an encyclopedia or reference book."

Scores of classrooms have wall maps showing their tankers' routes, with miniature models of the ships moved along as voyages progress. This often gives teachers ways to make otherwise remote subjects more meaningful, like problems related to the Suez Canal crisis and emergency shipments of oil to Europe.

Although the "Adopt-a-Ship" program is based primarily upon interchanging letters, tanker skipper and officers visit schools whenever feasible, often on their own time. As guests of honor, they are feted at dinners, address assemblies, hold round-table discussions and exchange gifts with their young admirers.

The high point of any adoption is a visit to the ship, possible when the school is within reasonable

School study projects related to oil tankers often prompt high school students to explore career possibilities in the nation's shipping industry.



distance of a port-of-call. Sinclair, Tidewater and Sun are among the companies which have been hosts to goggle-eyed youngsters eagerly exploring every nook and cranny open to them.

Even without such bonus opportunities, correspondence with ships often triggers special school study projects, inspires class forays to museums and libraries and arouses interest in the plants and laboratories of industries involved in or depending upon tanker operations.

The impact of the adoption program goes far beyond its junior participants. Some 40,000 adults have gained knowledge and appreciation of American shipping and related enterprises, largely by

sharing information with enthusiastic sons, daughters and educators.

Maps and descriptive literature are available to youngsters from the American Merchant Marine Institute, the shipping industry's largest trade association. These publications, taken home and read by parents too, include booklets provided by companies like Esso Shipping, Texaco and Cities Service. Requests for school information kits now average 800 per week.

In expressing appreciation to the oil companies already cooperating in the "Adopt-a-Ship" program, the supporting Institute and the Women's Organization add with some concern that there are close to 200 school groups already waiting to become foster parents. Unless more ships are available, 1,000 classes will be disappointed within a few years. Oil tankers are wanted particularly.

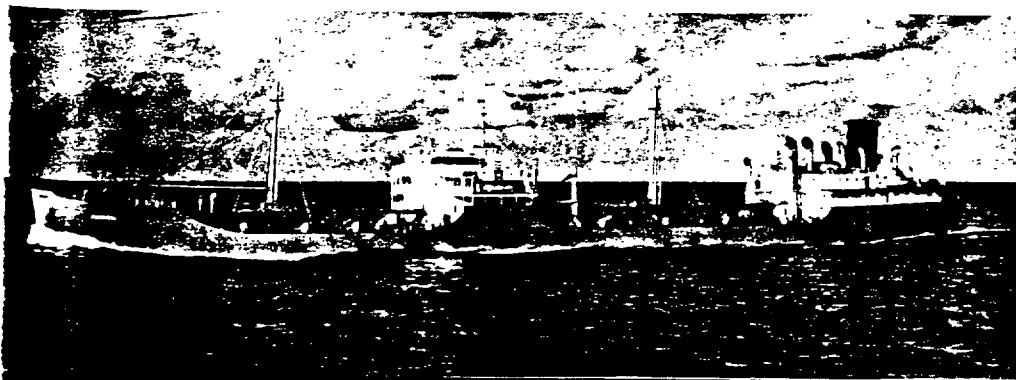
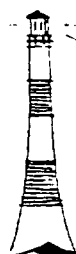
Opportunities Rewarding

Ties between more tankers and schools will give the oil industry additional opportunities to convey constructive information to the citizens of today and tomorrow, the Institute believes. Increased participation can bring such heartwarming rewards as what an adopted tanker means to children from broken homes at a school overlooking the Hudson River in New York. This is what their teacher has written:

"Letters and pictures from the *MB Cayuga Sun* are in a treasured scrapbook . . . You cannot imagine how thrilling it is when 'our ship' blows her whistle as she sails by. To many of the boys the captain fills a void in their lives . . . he has become their hero and ideal. Slowly the children are overcoming their emotional difficulties, because they are writing to someone who cares." #

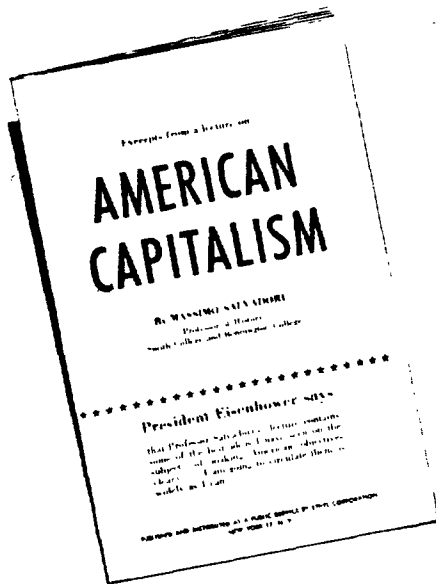


A company flag is presented to officers of "his" sixth grade by Tidewater Oil skipper Victor Gustavson.



Furthering the

Freedom's Foundation at Valley Forge and The American Heritage Fo



TWO FOUNDATIONS devoted to furthering American Way of Life have presented cover awards to Ethyl Corporation in recent months. Freedom's Foundation at Valley Forge (Pa.) awarded Ethyl a George Washington Honor Medal for "significant public service in publishing and stimulating wide contribution" of the booklet "American Capitalism."



Shown here are a copy of "American Capitalism" and the obverse and reverse sides of the George Washington Honor Medal which was presented to Ethyl for publishing and distributing the booklet.

"American Capitalism"

ONE DAY IN DECEMBER 1955, Massimo Salvadori, a Smith and Bennington College professor, of British and Italian descent, lectured at the Foreign Service Institute in Washington. He told government personnel concerned with foreign affairs about prevalent misconceptions regarding the American economic system—particularly among people abroad—and suggested what could be done to correct these erroneous impressions.

Beyond his immediate audience, however, Professor Salvadori's remarks went almost unnoticed until March 21, 1956. On that day, President Eisenhower told his press conference that he had been reading notes of the lecture and felt that they contained "some of the best ideas I have seen on the subject (of making American objectives clear)."

But while Mr. Eisenhower's statements were widely reported, few magazines and newspapers printed much of the lecture itself.

It was then that Ethyl Corporation recognized the opportunity to perform a public service by giving the lecture wide circulation. With Professor Salvadori's cooperation, Ethyl put the lecture notes in booklet form and published them.

First copies off the press were presented to President Eisenhower and Vice President Nixon. In a letter to Ethyl Corporation, the President said he was "delighted" to know that, through the booklet, "Professor Salvadori's ideas will receive the wide distribution they deserve." Mr. Nixon wrote that the booklet would help create "a clearer understanding of our economic system."

At first, Ethyl distributed copies of the booklet mainly to government leaders, college educators and business executives. Then came circulation on a much wider basis.

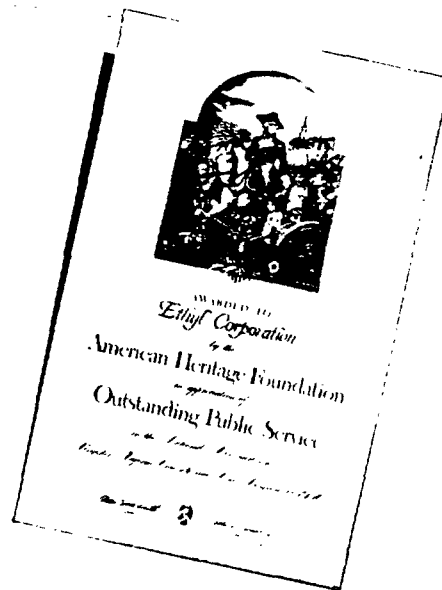
Here are a few examples of the uses to which
(Continued on page 14)

American Way

on present awards to Ethyl for outstanding public service programs

American Heritage Foundation gave Ethyl its top award for the best company program in the 1956 "Register, Inform Yourself and Vote" campaign. This award is a framed citation illustrated with a reproduction of an Arthur Szyk painting of George Washington.

Ethyl's efforts in these two programs to further the American Way of Life are described below.



Ethyl's "Get Out the Vote" efforts, which included the use of Scouts to distribute reminders to employees, earned for the Company the top award from The American Heritage Foundation.

"Register, Inform Yourself and Vote"

A NATURAL TENDENCY to take good things for granted has led in recent years to an alarming decline in the percentage of eligible voters who actually go to the polls. Instead of the patriotic duty and democratic privilege that it is, voting has come to be looked upon by all too many Americans as something to be done on Election Day only if the spirit moves them.

No single civic-minded group is more aware of, and disturbed by, this laxity on the part of millions of citizens than U. S. business and industry. To help overcome this apathy, business and industry raised its collective voice to a crescendo in the 1956 national election. Well-planned nonpartisan programs were conducted by countless companies to impress on employees and the general public their responsibility to (1) register, (2) study the candidates and the issues, and (3) vote intelligently.

As one of the companies which sponsored such

a program, Ethyl Corporation naturally is proud that The American Heritage Foundation judged its efforts the best conducted by any company.

"More than 7,000 awards candidates were evaluated in this competition," Walter Bedell Smith, chairman, and John C. Cornelius, president of The American Heritage Foundation, advised. "You are to be commended for the skillful planning, creative leadership and thorough execution which characterized your good citizenship achievement."

Ethyl's companywide program made extensive and repeated use of such tools as posters, reading rack booklets, automobile bumper strips, matchbooks and other "Be Sure to Vote" reminders. It also included several unique and effective features. Foremost of these were the "Scout Days" conducted at several Company locations.

At the manufacturing plants in Baton Rouge and
(Continued on page 14)

"American Capitalism"

(Continued from page 12)

the booklet was put: Trade associations mailed copies by the thousands to their memberships. A large telephone company used "American Capitalism" in its management development program. The U. S. representative to a 53-nation meeting of a group affiliated with the United Nations distributed copies at that meeting in Vienna. A nationwide company printed 112,000 copies for distribution to its employees. An oil company used 35,000 copies in its employee and educational relations programs. Another American oil company, operating in Africa, Asia and Australia, supplied copies of the booklet to 20 of its overseas locations.

Circulation of Professor Salvadori's remarks was further stimulated when "American Capitalism" was reprinted in many magazines and newspapers. These include such diverse publications as the *Philadelphia Inquirer*, the *Trade Union Courier* (officially endorsed by 2,000 AFL-CIO unions in the United States and Canada), the oldest Russian-language daily newspaper in the United States, and in the *Moroccan Courier*, an English-language newspaper published in Casablanca.

Well Received by Educators

Especially gratifying is the reception "American Capitalism" has enjoyed among educators and institutions of higher learning. All in all, more than 40,000 copies have been requested by over 300 colleges, for use by faculty and students.

Requests for the booklet have been received from individuals, companies and groups in more than a score of foreign countries.

In the ten months that "American Capitalism" has been available, its message has been circulated in one form or another to well over 1,600,000 people. On the basis of at least two readers to each copy of the booklet and the various reprints, it can be assumed that the message has been seen by more than 3,000,000 people.

Copies of the booklet—now in its fourth printing—still are available. Ethyl is happy to provide them free of charge to oil companies as a customer service and to colleges and individuals as a public service. In the case of other quantity requests, the booklet is supplied at a nominal cost. #

"Register . . . and Vote"

(Continued from page 13)

Houston and at the Ethyl research laboratories in Detroit, Boy Scouts distributed appropriate literature to employees before the election.

The "Scout Day" program in New York was even fuller. Starting at 8 a.m. on the day before Election Day, a corps of Girl and Boy Scouts (children of Ethyl employees) distributed "Be Sure to Vote Tomorrow" literature to the 4,000 people who work for all companies in the building where Ethyl's general offices are located. Later in the day, the youngsters were formed into Girl-and-Boy-Scout teams and visited Ethyl employees in their offices with a personal reminder to be sure to vote.

Scouts Hear Kettering

At a special luncheon in their honor, the Scouts were addressed by Charles F. Kettering, an Ethyl Corporation director, and Ethyl's president, B. B. Turner. Following luncheon, the Scouts were taken on a guided tour of the United Nations.

Another highly successful innovation of the Ethyl program was the "Which Voter Are You?" feature in the July-August issue of ETHYL NEWS. The immediate response to this was so overwhelming that Ethyl provided free reprints to all who requested them. More than 70,000 of the reprints were sent to over 30 companies, mostly in the oil industry.

Companies put the reprints to a variety of uses including mailing them to employees and stockholders. The "Which Voter Are You?" feature also was posted on scores of company bulletin boards and reprinted in several company publications and advertisements.

Was the over-all Ethyl program successful in encouraging and stimulating Company employees to vote on November 6? An impartial survey conducted by Opinion Research Corporation, of Princeton, N. J., revealed that it was outstandingly so. The survey was conducted the day after Election Day among Ethyl employees in New York City, Detroit and Tulsa.

On the basis of its survey, Opinion Research Corporation reported, 96.4 percent of all Ethyl employees eligible to vote actually cast ballots. This, of course, is far higher than the voting average of about 60 percent for the nation as a whole. #

Toward a Better Understanding of An Important Man

ON THE BACK COVER of this issue of ETHYL NEWS you will see the first advertisement in a new Ethyl series directed to the motoring public.

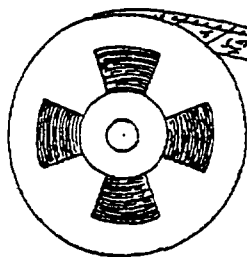
Each ad in the series will be designed to contribute to a better understanding of America's service station men—the front-line ambassadors who represent the oil industry every day to millions of motorists.

Securing strong public support for service station men has become increasingly important to the oil industry since public recognition and respect



help build the morale and prestige of the men at the pumps. Ethyl has prepared this new series as an industry-wide service to help do this needed job.

The advertisements will appear in leading national magazines with an estimated audience of 37 million. They will be seen by millions of motorists and by many thousand service station men. #



Cooling System Film Added to Automotive Series

A NEW sound and color motion picture—this one on the cooling system—has been added to a kit of films dealing with the operation of the modern automobile produced as a customer service by Ethyl Corporation last year (*Fundamentals on Film*, Ethyl News, September-October 1956).

The subject matter of the new cooling system motion picture deals with the production of heat in the engine, the need for the cooling system, and the functions of the water jacket, radiator, hose connections, pump, fan, thermostat, pressure cap and temperature indicator. It covers the basic steps in cool-

ing system maintenance. These include periodic draining, cleaning, preventing rust and scale formation, use of anti-freeze, inspection for leaks, and checking the condition of hose connections, fan belt and thermostat.

The Ethyl-produced automotive films are designed for use by oil companies in training marketing personnel. Besides the new cooling system film, the series includes two films on gasoline and one each on the electrical system, distributor, spark plugs, valves and carburetor. Running times range from six to eight minutes each. #

A New Approach to TEL

Ethyl chemists discuss promising new way to manufacture TEL simply and efficiently by utilizing common lead compounds

By Christopher C. Vogel

EVEN THOUGH Ethyl Corporation plants and processes devoted to the manufacture of tetraethyl lead have been developed to a high state of efficiency over the years, research and development work on manufacturing operations continues. Such work takes two broad forms—a constant search for process improvements and manufacturing economies in the present process, and a continuing exploration and evaluation of alternate methods of making TEL.

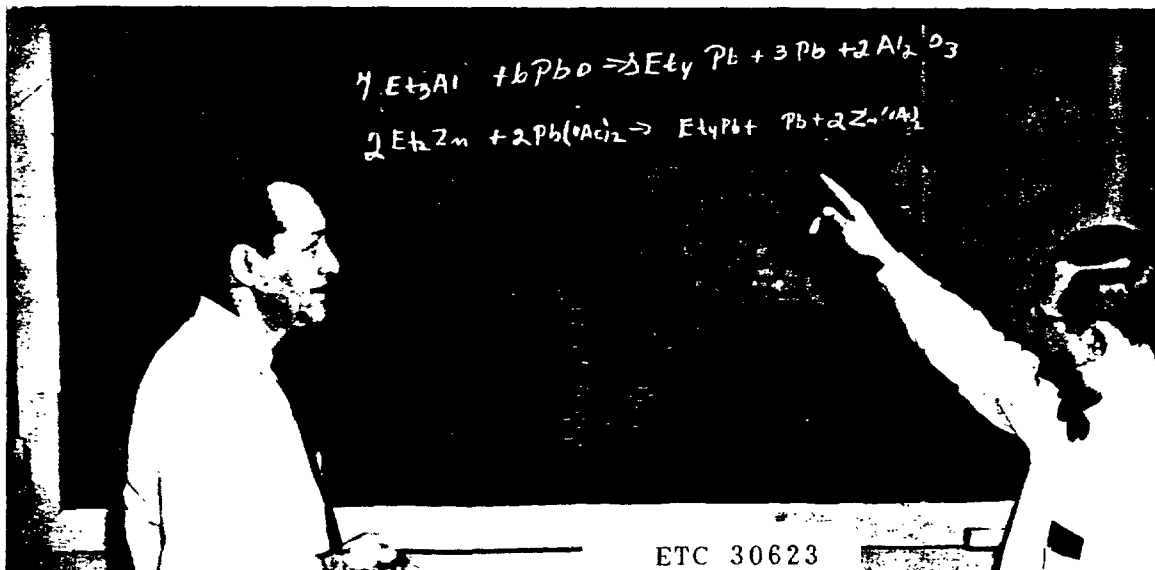
Ethyl's research efforts in the latter direction recently have led to the development of a new method for synthesizing tetraethyl lead. The new process was reported in a paper by a group of Ethyl research chemists at the American Chemical Society's 131st national meeting in Miami early in April. The paper's authors were T. H. Pearson, S. M. Blitzer, D. R. Carley, T. W. McKay, R. L. Ray, L. L. Sims, and J. R. Zietz, all of Ethyl's Research and Development department.

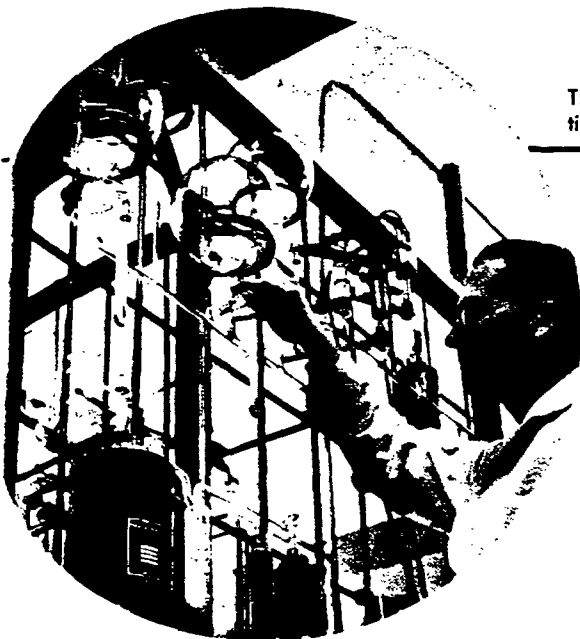
Six Ethyl Papers

The paper on the new TEL-synthesizing method was one of three on the chemistry of tetraethyl lead given at the ACS gathering by Ethyl representatives, and one of six Ethyl papers, all told, presented at the meeting.

Illustrating the broad scope of Ethyl's research

Reactions in Ethyl's new experimental TEL method are recorded by S. M. Blitzer and T. H. Pearson, research chem





The new method is a product of Ethyl's continuing research on manufacturing operations.

work on TEL manufacture, a paper by Hymin Shapiro, assistant director of chemical research, reviewed all phases of manufacturing technology to date. It pointed out that Ethyl's present highly-developed commercial process has been a major factor in TEL's low cost and widespread use in gasoline. A third paper, by R. L. Milde and H. A. Beatty, also of Ethyl's Research and Development department, traced the many possible applications of tetraethyl lead as a chemical intermediate, including the manufacture of plastics.

Compared with the present commercial TEL-manufacturing process which involves the reaction of a sodium-lead alloy with ethyl chloride, the new method makes it possible to synthesize tetraethyl lead from a wide range of organometallic compounds by reacting them with common lead compounds. Among these lead compounds are lead sulphide, lead oxide and lead dioxide.

The potential importance of Ethyl's new method lies in the fact that it represents a radical departure from present technology. It also provides a means of utilizing hitherto unsuitable lead compounds simply and efficiently.

Results of the Ethyl experiments showed that the reactions could be conducted at mild temperatures, that they proceeded at moderate to rapid rates, and that tetraethyl lead yields of over 80% and even 90% were obtained in many cases.

Since two of the major elements of cost in the manufacture of TEL are sodium and chlorine, the research project sought to circumvent the use of these chemicals. Attention was devoted to a virtually unexplored field of non-halide lead compounds. Its success has opened up an entirely new approach in the synthesis of organolead compounds.

During the research work, Ethyl chemists developed a new way to manufacture triethyl aluminum, one of several organometallic compounds of possible interest in the new TEL chemistry. Ethyl's method requires only aluminum, hydrogen and ethylene as raw materials and involves only moderate temperature and pressure. The Company has obtained a patent on this new process.

Besides its potential usefulness in tetraethyl lead, triethyl aluminum has received wide publicity as an important ingredient in catalysts for olefinic polymers and particularly high density polyethylene. It also is of interest in the rapidly expanding technology of organometallic chemicals.

Triethyl Aluminum Available

As a result of its work, Ethyl currently has available for sale to interested companies semi-commercial quantities of triethyl and trimethyl aluminum.

As promising as it is, Ethyl's new method for synthesizing tetraethyl lead is still in the laboratory stage. Many considerations are involved before it could be used commercially.

As Dr. George F. Kirby, Jr., Ethyl's vice president in charge of Research and Development, expresses it, "We are very proud of the new method invented by our technical people and of its very great potential for the future. However, it must be emphasized that the new method is still in the research stage. To be successful, it must be able to compete with our present highly-developed and highly-efficient TEL plant process.

"In view of the major development work still required, the new method is still some years away from commercial application. Nevertheless, we intend to study all of its phases, as well as to continue to explore the whole field of potential new antiknock agents." #

THAT DAY

The Ethyl pioneer of the first high compression tractor
recalls how modern power farming began

By George Krieger



George Krieger, the author of this article, joined Ethyl Corporation in 1929 and has been with the Company continuously ever since.

Born and raised in Virginia, he spent some of his early years on a family farm near Norfolk. He was graduated in 1926 from Virginia Polytechnic Institute, and was one of the first persons ever to receive a degree in what is now called professional agricultural engineering.

During World War II, while on leave from Ethyl, Mr. Krieger served as director of the Farm Machinery and Equipment Division of the War Production Board and also as a special assistant to WPB Chairman Donald M. Nelson. — *The Editors*

LOOKING BACK NOW, it's hard to believe that the rapid gains scored in automobile engines and fuels in the 1920's and early 1930's had not been carried over to the farm tractor. But they hadn't.

Before the summer of 1934, in fact, there wasn't a single high compression gasoline-powered farm tractor in operation anywhere in the world. Some tractors were being run on gasoline—and a few gasoline-burning tractors had been manufactured as early as 1901—but the engines in these units were not high compression as we know and use the term today.

Now, of course, high compression tractors are at work by the millions. They are one of the principal reasons for the great productivity of modern farms throughout the world.

Where It All Began

High compression gasoline-powered farming as we know it today got its start when a farmer's tractor was converted from low compression to high in a small midwestern town, and proved its worth in a dramatic test on the farm of its owner, Clarence Dauberman.

The place was Kaneville, Ill., and the date, July 31, 1934. But that comes a little later in the story . . .

Going into the 1930's, even the latest model

IN KANEVILLE

tractors had low compression engines designed for kerosene and distillates—not gasoline. In contrast, the average compression ratio of automobile engines was inching up constantly and gasoline—thanks largely to the more widespread use of “Ethyl” antiknock compounds—was increasing in octane value.

Then while on a train trip from Baltimore to Detroit one day in September 1930, it occurred to me that the farm tractor field was one which Ethyl Corporation might enter to the betterment of all—particularly farmers.

Enthusiastic Support

Upon my return to Baltimore, I told Oscar B. Lewis (then Ethyl's Baltimore division manager, now vice president of Ethyl Corporation of Canada Limited) about my idea. He was very enthusiastic and so were several men in the U. S. Department of Agriculture whom I sounded out.

When the proposal was presented to top management of Ethyl Corporation in New York in October, they authorized the institution and execution of a supporting program.

For most of the next four years, we were missionaries—in the true sense of the word. For every person and every group that could foresee a bright future for high compression gasoline-powered farming, there were—or so it seemed at that time—a million who remained unsold on the idea. It was necessary to travel the country to line up support by agricultural leaders, universities, oil companies, tractor manufacturers, tire companies, committees of the Society of Automotive Engineers and American Society of Agricultural Engineers, and repre-



This plaque on the Dauberman farm marks the birthplace of the high compression tractor.

Today, high compression gasoline-powered farm tractors are at work by the millions.



ETC 30626

sentatives of the American Petroleum Institute.

At the same time, the Ethyl Research Laboratories were conducting tests to prove our contention that the high compression gasoline tractor would turn out to be the farmer's best friend since the horse.

There were successes and setbacks during those idea-selling years from 1930 to 1934. The final road to victory started out as a trip through Illinois in July 1934. I was with representatives of Globe Oil and Refining Company and Illinois Farm Supply Company. We were to straighten out some complaints from farmers who had been using gasoline in their tractors.

Conversion Suggested

Most of the complaints were quickly remedied through minor adjustments in engines. The trouble was that the farmers were using gasoline in power units that were designed and adjusted for operation on kerosene or distillates.

The trouble with Clarence Dauberman's tractor at Kaneville was not solved so readily. We probed the engine for quite some time, but couldn't find the trouble—and told Dauberman so, quite frankly.

Then a sudden thought struck me. Why not demonstrate the value of high compression on a farmer's own tractor?

I suggested to Dauberman that he let me convert his unit. I promised that if he would, his "new" tractor would do twice as much work on the same amount of fuel.

This was the Depression year of 1934. Like

everyone else, Farmer Dauberman was looking for ways to get extra value for his money. So he agreed to my suggestion. The conversion work was to be done in the shop of Eddie Freundt, the International Harvester dealer in nearby Hinckley, Ill., who had sold Dauberman his tractor.

Ordinarily it is a relatively simple matter to convert an engine from low to high compression. You replace the original pistons with "high altitude," or high compression pistons; install "cold" (gasoline) spark plugs; substitute a "cold" gasoline manifold for the "hot" kerosene one; and do a few other things. But Freundt didn't have high altitude pistons or the other needed parts. We had to telephone Chicago and ask L. B. Sperry, chief engineer of International Harvester, to rush them to us. No gasoline manifold was handy either, but we managed to borrow one from an industrial engine in the area. The carburetor I made myself with parts from various other units.

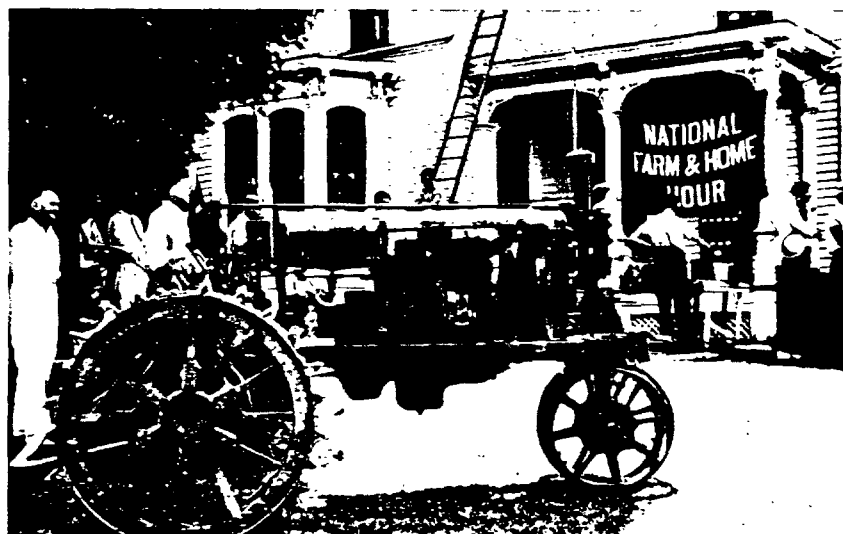
Despite the obstacles, the conversion was completed in about a week.

Tug-of-War Staged

It had been my intention to demonstrate the superiority of the gasoline-powered high compression tractor by having it pull four plows instead of the usual two, thus performing twice as much work on the same amount of fuel. But on July 31, the day of the demonstration, Eddie Freundt, the International Harvester dealer, said no, let's do it another way.

Dauberman owned two identical tractors—the

Right, the Dauberman tractor that was converted to prove the superiority of high compression gasoline power for farming . . . Far right, C. L. Dauberman is presented with a new tractor by Sydney McAllister, International Harvester executive, at ceremonies marking an anniversary of the birth of high compression farming.



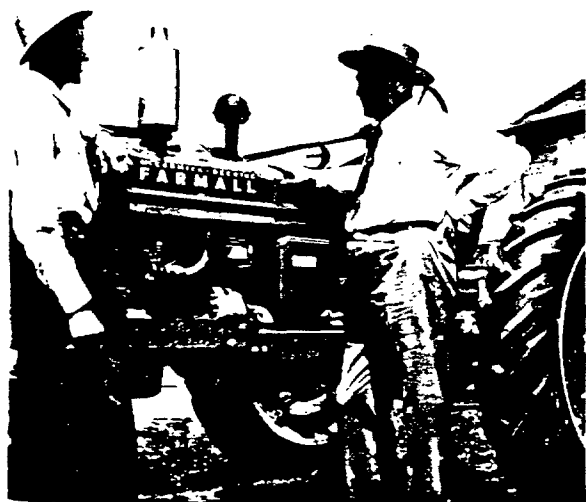


George Krieger, the author (right), is introduced as a man to whom "agriculture owes . . . a great debt."

one we had converted to high compression and another that was unchanged. Freundt's idea was to hook a heavy chain to the rear end of each tractor and let them pull against each other in opposite directions.

Freundt manned the low compression tractor and Earl Dauberman, Clarence's nephew, drove the converted unit. Both were operated on the same fuel—regular grade gasoline (probably about 70 octane number) taken from Dauberman's storage tank.

At a given signal, with each tractor in gear, both operators let out their clutches. From the very beginning, it was no contest. The high compression job surged forward, easily pulling the other tractor behind it. It had clearly demonstrated its superiority!



The only people to witness the birth of the gasoline-powered high compression tractor beside those of us directly involved were Freundt's teen-age son, a few of Dauberman's relatives, a half-dozen neighboring farmers who had heard what was taking place, and Glenn Warne, the local Farm Bureau manager. No bands played, no dignitaries spoke and no newspapers reported what happened that day in Kaneville.

The fanfare came seven years to the day later (July 31, 1941) when "Clarence Dauberman Day" was observed on a coast-to-coast broadcast of NBC's National Farm and Home Hour and on the Dinner Bell program of *The Prairie Farmer's* Station WLS. A highlight of the ceremony was the unveiling of a bronze plaque, mounted on a granite marker, on Dauberman's farm.

Along with Sydney McAllister, chairman of the International Harvester executive committee, and Ray Shawl, professor of agricultural engineering at the University of Illinois, it was my privilege to take part in the broadcasts. (*Editor's note: Mr. Krieger was introduced to radio audiences and to the thousands gathered at the scene as a man to whom "agriculture owes . . . a great debt."*)

News of what happened on the Clarence Dauberman farm on that last day of July 1934 spread fast. More Ethyl men were added to the project and all of us worked closely with tractor manufacturers, oil companies, farmers and others who immediately showed overwhelming interest in the new type of farm power.

It took very few demonstrations to convince engineers and executives of tractor manufacturing concerns that they should begin making high compression gasoline-powered models. A little over a year after the Dauberman conversion, the first production models began to appear. Their new type engines were specifically designed to operate efficiently on the regular grade gasoline available—then about 70 octane number.

The ensuing popularity and significance of the gasoline-powered tractor in agriculture is well known. It is a great source of satisfaction to me to have shared in the development of the high compression gasoline tractor and to know that it is one of the primary factors responsible for America's abundance from the farm. #

Thickening the Plot with Oil



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

By James E. Boudreau

HEN 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.

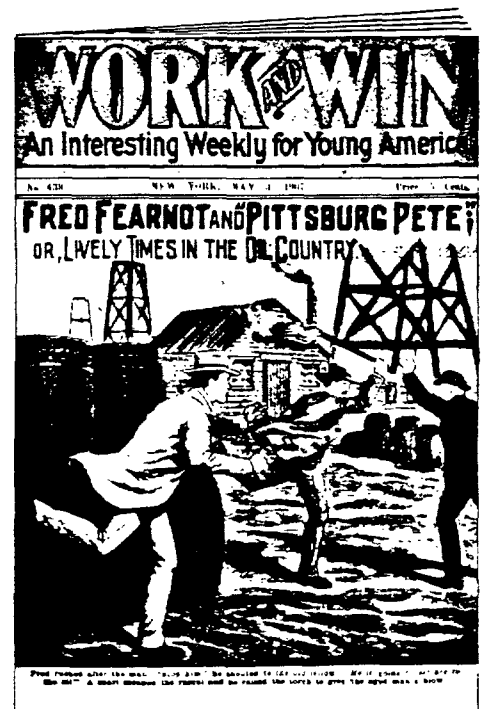
Thanks to Fearnot's acumen, courage and pugilistic prowess, he defeats his opponents, outwits Pete and brings temperance to alcoholic fathers. Fred

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 dashed in pursuit of the man with the torch. His



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the Perils of Petroleum Pioneers

captors yelled and pursued him, and in another moment Fred was in the roughest mixup of his life."

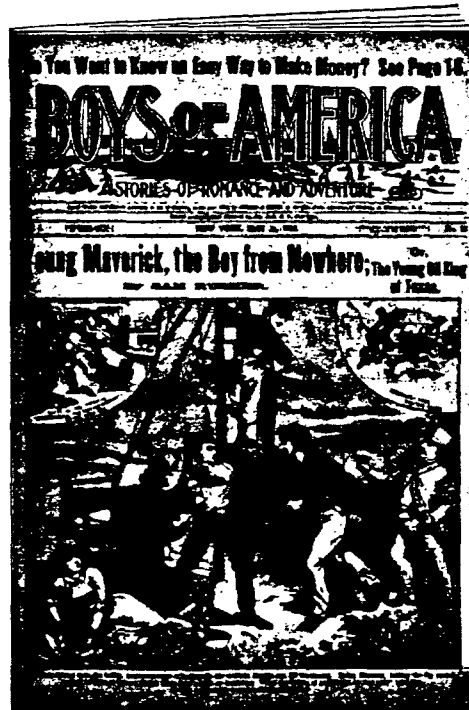
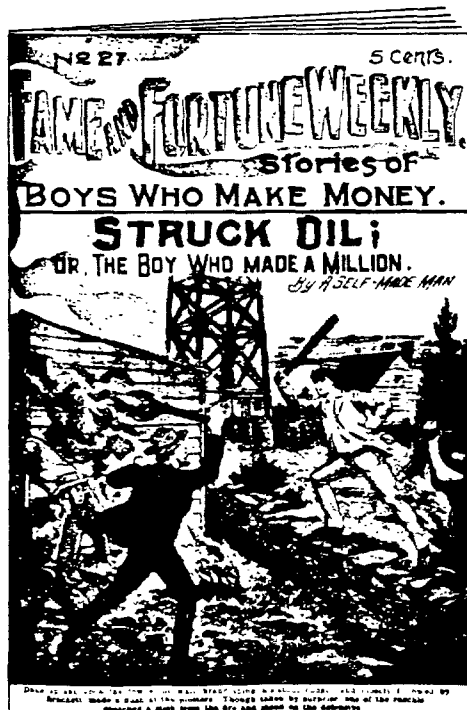
And in "Young Maverick, the Boy from Nowhere," a 1902 story about the early days of Texas oil, gallantry is combined with gushers, gold and skullduggery when a helpless girl is protected by a brave young man: "As the hero's friend sprang upon the derrick ladder, the villain . . . brought out his six-shooter. 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.'"

In spite of ridiculous plots, exaggerated characters and writing not only flamboyant but ungrammatical, dime novels about early oil field days shed considerable light on bygone times. Their value as historical material, however, has been recognized only 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 preservation of dime novels.

That is why the once lowly publications are so scarce and valuable today—worth anywhere from \$3 to \$100 or more per copy. Hobby collectors and even important libraries now 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 13 titles in its collection of material relating to the early days of petroleum. Dating from 1880, these rare publications help make the Ethyl library most complete and diversified.

Dime novels from Ethyl's archives were exhibited recently at the Deering Library of Northwestern University. Cover drawings show the intrepid heroes in valiant and always successful action.

All the publications have alluring "or" subheadings to amplify each story's 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;" "The Mystery of the Giant Gusher;" and "A Stroke of Luck; *or*, The Boy Who Made Money in Oil."

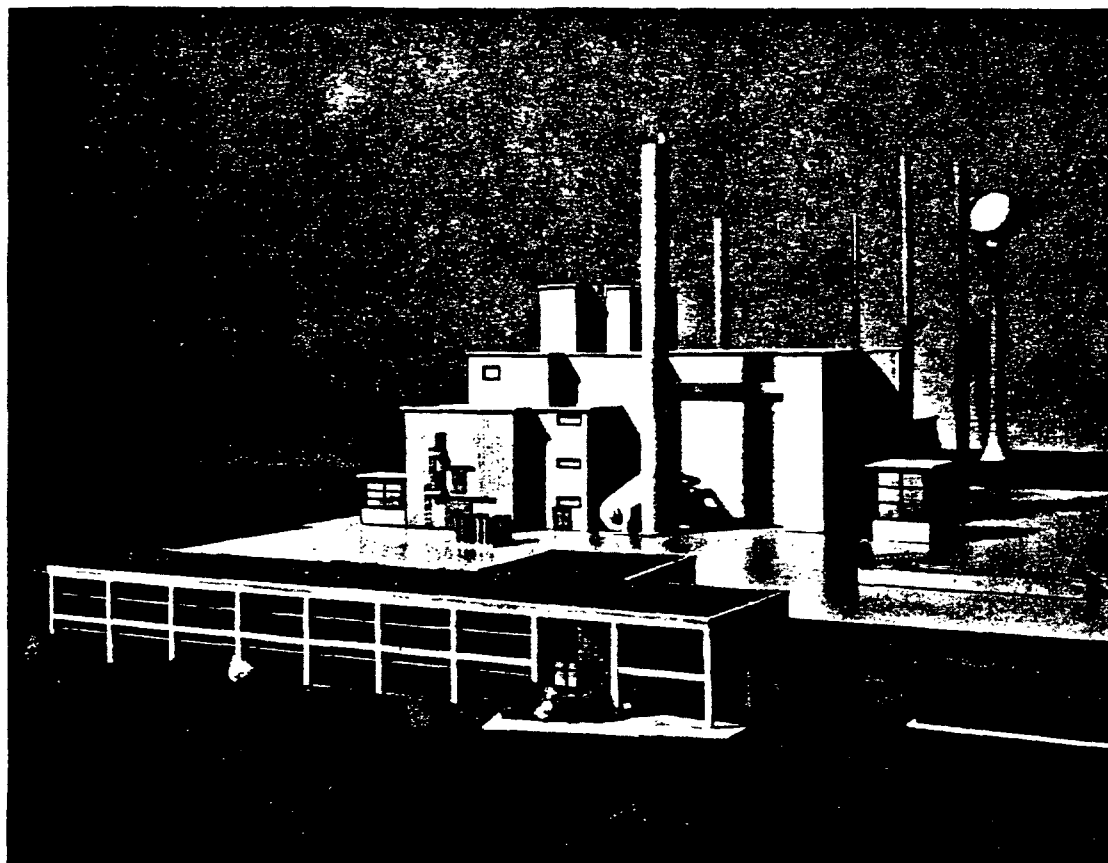
Two blood-curdlers which Ethyl is attempting to locate and acquire are "Dead-Arm Brandt;" and "The Long Vengeance," an 1887 publication, and "Nick Carter Strikes Oil; *or*, Discovering More in a Murder," a *Nick Carter Weekly* item of 1901. The Company is continuing its efforts to identify and obtain 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. #



Hundreds of visitors saw the Ethyl dime novel collection in the "Petroleum in Fiction" display at Northwestern University's Deering Library.

New Plant in Miniature



WITHIN a few months, the new Ethyl Corporation plant being built in the San Francisco Bay area at Pittsburg, Calif., will begin to look like this scale model. Designed to supply West Coast oil refiners, the Company's latest antiknock compound manufacturing center is scheduled to begin producing "Ethyl" fluid about the middle of next year. As engineers are aware, such scale models—widely employed in industrial construction work—are more than interesting projections of blueprints. Such miniatures are highly valuable in planning proposed installations efficiently and economically, in increasing their attractiveness and in helping management visualize details of even the most complex kind of manufacturing plant.

RING OF FUTURE

Identifies service station men as forward-looking. Their business has grown many fold in the past few years and will continue to grow in the future.

Today, service stations are an important part of America's daily life . . . an important part of the oil industry . . . and important to your car's well being.

LINE OF FRIENDSHIP

Labels men who like people. Warm, friendly men who believe in being helpful. Men you can count on, day in and day out, to do the best job possible for you.

LINE OF TRUST

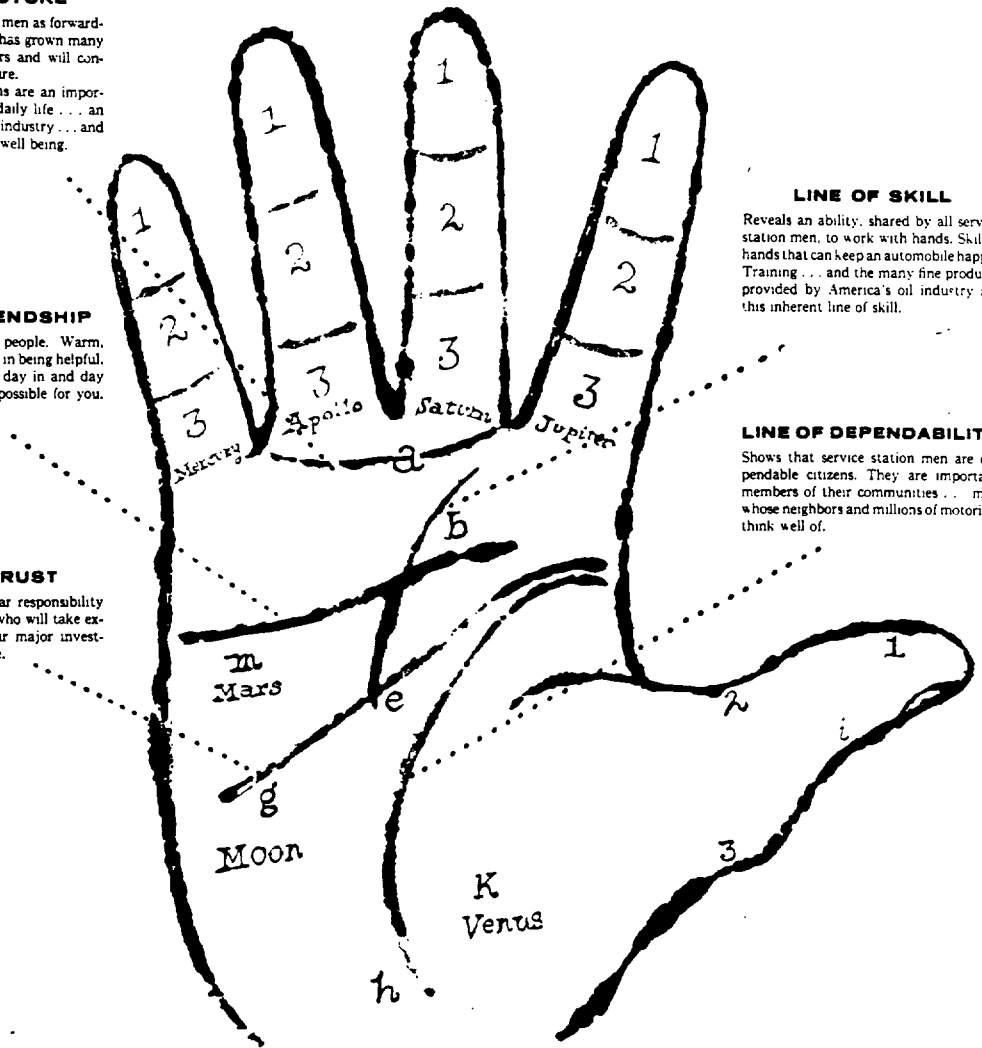
Marks the men who bear responsibility well. Trustworthy men who will take expert care of one of your major investments—your automobile.

LINE OF SKILL

Reveals an ability, shared by all service station men, to work with hands. Skilled hands that can keep an automobile happy. Training . . . and the many fine products provided by America's oil industry aid this inherent line of skill.

LINE OF DEPENDABILITY

Shows that service station men are dependable citizens. They are important members of their communities . . . men whose neighbors and millions of motorists think well of.



Over 200,000 just like it!

You'll find men with these qualifications ready to help you, and every motorist, on every highway and byway throughout America.

Knowing that experienced and friendly help is as near as the next service station makes modern motoring a carefree pleasure.

America's service station teams give today's motorist the road-long reassurance that he never drives completely alone.



ETHYL CORPORATION
NEW YORK 17, N. Y.

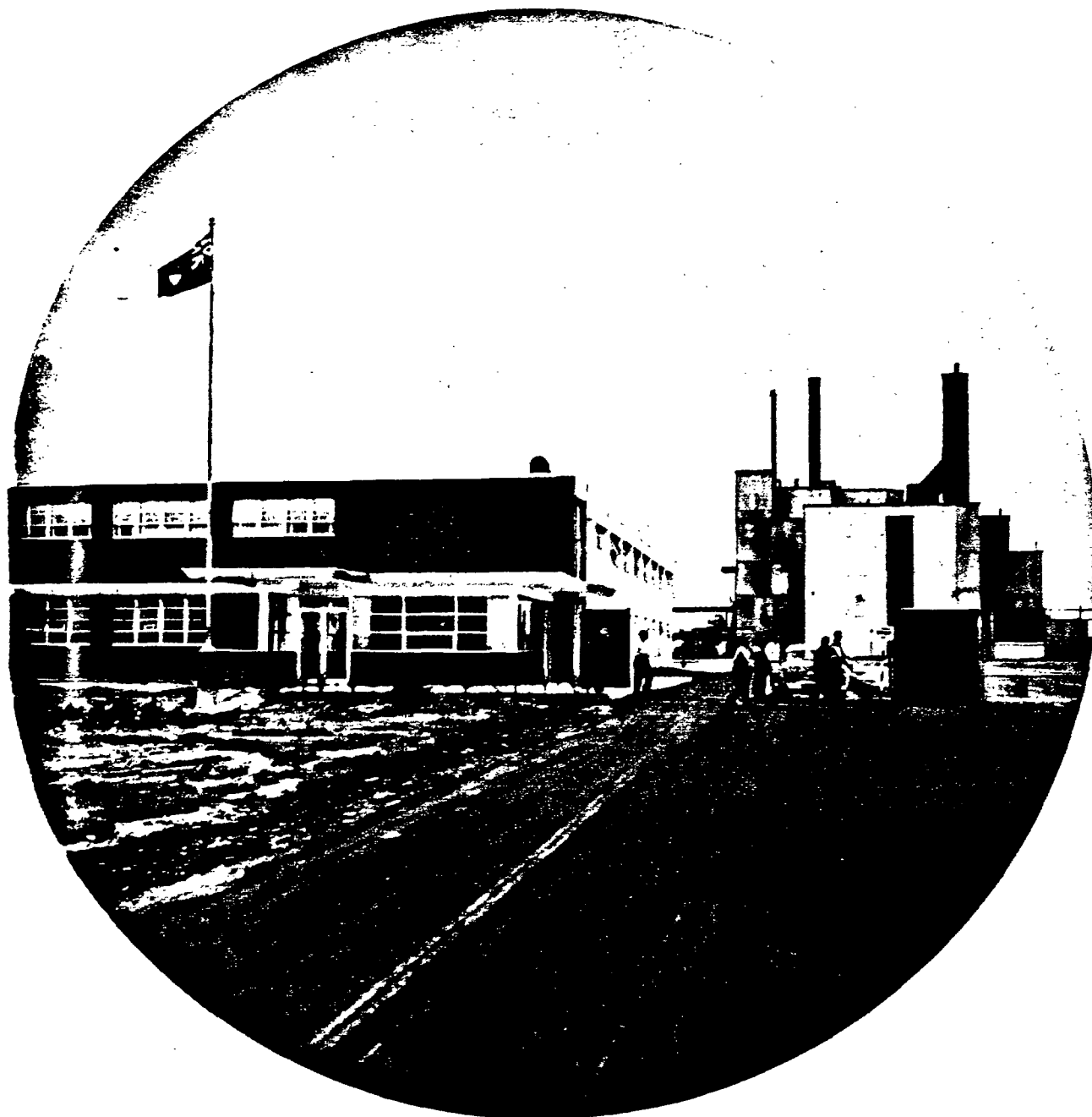
Manufacturers of "Ethyl" antiknock compound—used by oil companies everywhere to improve their gasoline.

ETC 30633

This is the first national advertisement in a new series designed to increase public appreciation of the significant role played by the nation's service station men in our daily lives. We believe they deserve recognition for their many contributions to their communities, to the motoring public, and to the industry they represent . . . **ETHYL CORPORATION**

Ethyl News

MAY—JUNE 1957



In this issue:

ETHYL OF CANADA
PLANT OPENING

AK-33X —
ETHYL'S NEW ANTIKNOCK

ETC 30634

Ethyl News

MAY - JUNE 1957

Ethyl News



SPECIAL SECTION
ETHYL OF CANADA PLANT OPENING

THE COVER: Ethyl of Canada's new plant adds a compact silhouette to the industrial skyline in and around Sarnia, Ontario. Offices are in the brick building on the left. Beyond is the process building where "Ethyl" antiknock compound is made. A special section on the formal plant opening appears on pages 9-20.

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CREDITS:

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ETC 30635

AK-33X— Ethyl's New Antiknock

**Organic compound of manganese
developed by Research Laboratories
supplements action of tetraethyl lead**

By Christopher C. Vogel

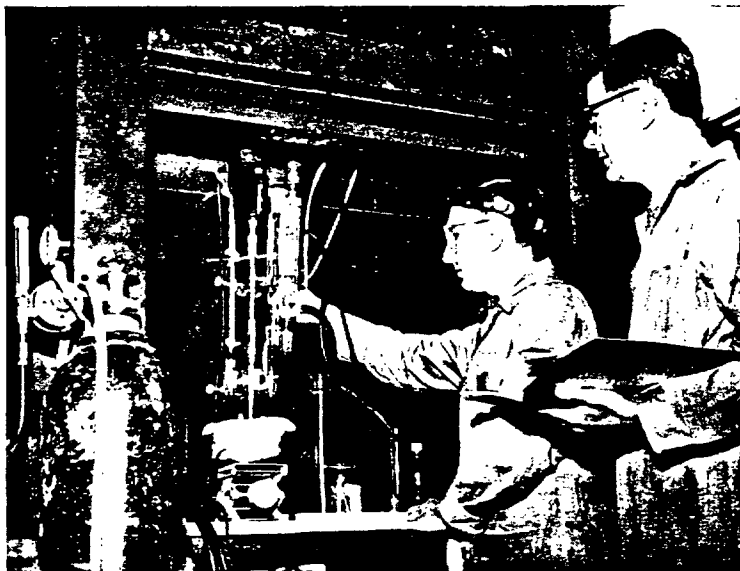
THE NEW ANTIKNOCK COMPOUND for aviation gasoline developed in Ethyl Corporation's Research Laboratories and announced by the Company in late June has permitted power gains of up to 20 percent in full-scale engine tests. The tests, conducted cooperatively with Curtiss-Wright Corporation, were made in the latter's 18-cylinder Turbo Compound engine at the engineering laboratories of the Wright Aeronautical Division in Wood-Ridge, N. J.

In disclosing the new aviation gasoline additive, E. L. Shea, Ethyl's board chairman, said it promises to be an important advance in the octane improvement of gasoline by chemical means. He said the compound, designated tentatively as AK-33X, was used in tests to supplement the antiknock action of tetraethyl lead and thereby provided greater gains in antiknock value than obtainable with tetraethyl lead alone.

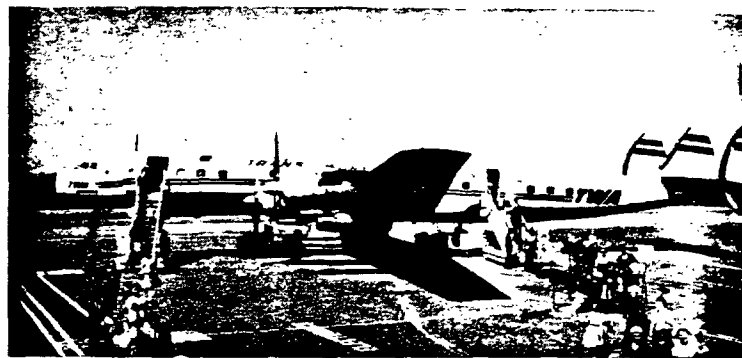
In the cooperative test program with Curtiss-Wright, tests in a full-scale Wright R-3350 Turbo Compound engine indicate that the use of the new compound as a supplement to TEL in grade

115/145 aviation gasoline will enable aircraft to cruise faster, carry larger payloads, fly at higher altitudes and exhibit improved fuel economy. The results indicate large potential power increases of up to 20 percent for take-off, climbing and cruising, without changing engine size.

Commenting on the test results, Roy T. Hurley, chairman and president of Curtiss-Wright Corporation, said, "The Turbo Compound power increases made possible by Ethyl's newly announced aviation gasoline additive will enable us to achieve new heights in performance. Benefits to engines now in service include the capacity of these fuels to increase detonation margins and thus improve combustion chamber durability." Of more significance, he pointed out, is the fact that the new fuel additive is expected to increase cruise power of new Turbo Compounds by 20 percent and the cruise speed of aircraft powered by these engines



Developed in Ethyl Corporation's Research Laboratories, the new antiknock is a stable organic compound of manganese.



by seven percent or approximately 25 miles an hour.

In announcing the development of AK-33X at the present time, Ethyl did so for two reasons. One is the indicated importance of the compound to the further development of aircraft piston engines. The second reason is to permit the oil industry to consider its possible use as a supplement to TEL in connection with the forward planning of refinery operations and processes.

Value to Oil Industry

In view of its potential ability to supplement the action of tetraethyl lead and thereby provide a greater gain in octane number than heretofore possible with TEL alone, AK-33X could be of inestimable value to the oil industry. It is especially significant in view of the expected continuing increase in octane numbers together with the great expense of attaining them by processing steps.

The effectiveness of AK-33X, tests to date indicate, varies widely in different gasoline base stocks. It is more effective under Research method rating conditions than under Motor method rating conditions, and it is most effective in those fuels which have good response to TEL. In general, as a primary antiknock, AK-33X is about twice as effective as tetraethyl lead on a weight of metal basis (based on Research method ratings). At the same time, it is less affected by the common antiknock antagonists, such as sulfur.

Test results indicate that when used as a supplement to tetraethyl lead in typical motor gasoline, AK-33X varies widely in effectiveness. It is highly effective in some base stocks, while in others it produces only limited results. Refiners undoubtedly will want to study carefully the influence of their base fuel composition on the

Use of AK-33X will enable the Turbo Compound engine (right) to increase the take-off and climb power and cruising speed of the Super Constellation and DC-7, laboratory tests indicate

efficiency of AK-33X as a supplement to tetraethyl lead.

A unique "promoter" effect has been noted for AK-33X in about 80 percent of the gasoline tested. This hitherto unknown effect occurs when very small initial concentrations of AK-33X are used with TEL. They give octane number gain proportionately much larger than given by any succeeding increment of AK-33X of the same size.

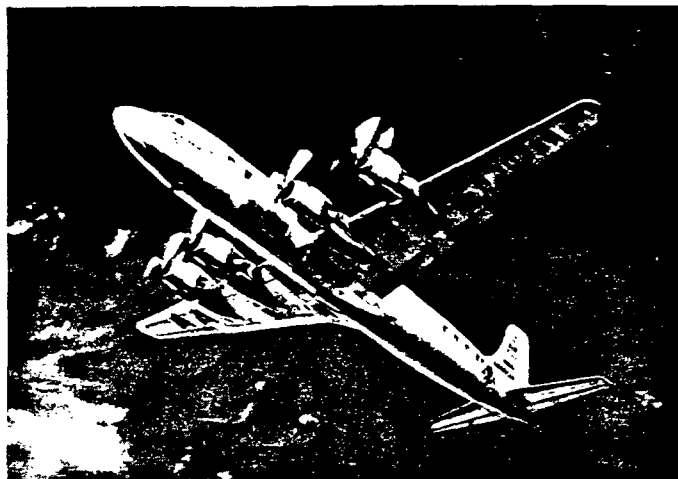
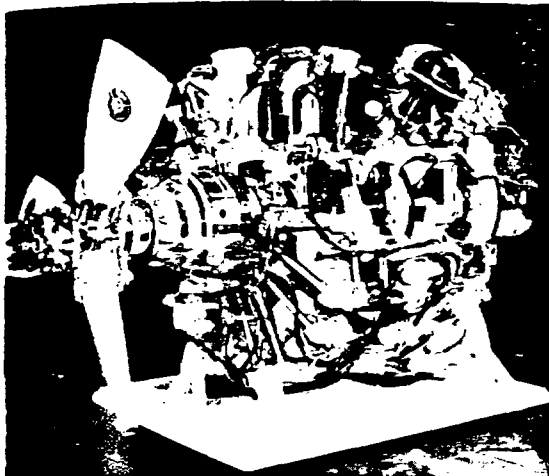
In tests with pure hydrocarbons, AK-33X was found to produce an octane response similar to that of TEL. Thus it was found to be best with paraffins, almost equally good in naphthenes, and poorer in aromatics. Its effectiveness in olefins varies greatly with structure of the olefins, giving effects similar to their response to TEL.

Use in Motor Gasoline

While the first major use of AK-33X, it is believed, will be as a supplement to tetraethyl lead in grade 115/145 aviation gasolines, eventually it may also be used in addition to TEL to improve the octane number of automotive gasolines.

However, its future use in motor fuels will be dependent upon two things: first, the attractiveness of the compound, from an antiknock effectiveness standpoint, in each individual refiner's fuels, and second, the development of corrective agents which will overcome some engine durability problems particularly as applied to spark plugs and valves.

Ethyl's research laboratories are working on corrective agents for AK-33X which, it is anticipated,



pated, will solve durability problems satisfactorily. Present indications are that AK-33X will be compatible with other commonly used gasoline and lubricating oil additives.

Samples Available

Currently, Ethyl Corporation is making experimental samples of AK-33X available to oil companies, so that they can evaluate it in their own base stocks.

Ethyl will test motor gasoline blends containing the new compound submitted by refiners. It also will make available to refiners the test data on commercial gasolines it has already tested with the new compound.

The new antiknock agent is a stable organic compound of manganese. It is known chemically as methyl cyclopentadienyl manganese tricarbonyl. A

straw-colored liquid, about one-quarter of its total weight consists of manganese.

The raw materials used in the manufacture of AK-33X are methyl cyclopentadiene (a component of some refinery streams), sodium, manganous chloride and carbon monoxide. Ethyl has worked out a manufacturing process for the compound, and is prepared to supply any indicated needs for it in aviation gasoline. It is, however, too early to indicate when large-scale manufacturing facilities might be placed in operation.

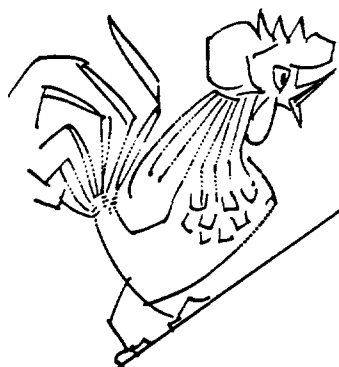
Patents Applied For

Ethyl has applied for patent coverage on AK-33X and related materials. Coverage is also being sought for use of the compound as a gasoline additive and for methods of manufacture which the Company has developed. #

Road tests are included in Ethyl's investigations of the potential applications of AK-33X as a supplementary antiknock for motor fuels.



ETC 30638



Architect

In its golden anniversary year, the Amer

WHEN EZRA TAFT BENSON, Secretary of Agriculture, predicted recently that "push-button farming" may be "just around the corner," he was paying well-deserved tribute to the contributions of engineering to progress on the American farm.

In common with all of the other enterprises that aid in this country's growth and prosperity, agriculture owes much to engineering. And there isn't any foreseeable limit to what can be accomplished in farming through the continued application of technology.

This viewpoint is upheld vigorously by the American Society of Agricultural Engineers, which is observing its 50th birthday this year. As the nation's largest organization concentrating on the broad engineering aspects of better farming, the ASAE has a golden anniversary theme of "Looking to the Future" for its annual meeting on the campus of Michigan State University, in East Lansing, this June.

More than 1,200 delegates from the United States, Canada and other countries are taking part in a four-day program of lectures, technical sessions, discussions, workshops, displays and tours. The agenda includes current as well as long-range problems, projects and goals.

The future presents formidable challenges to experts seeking to outdo the accomplishments of yesteryear. Their most essential objective is

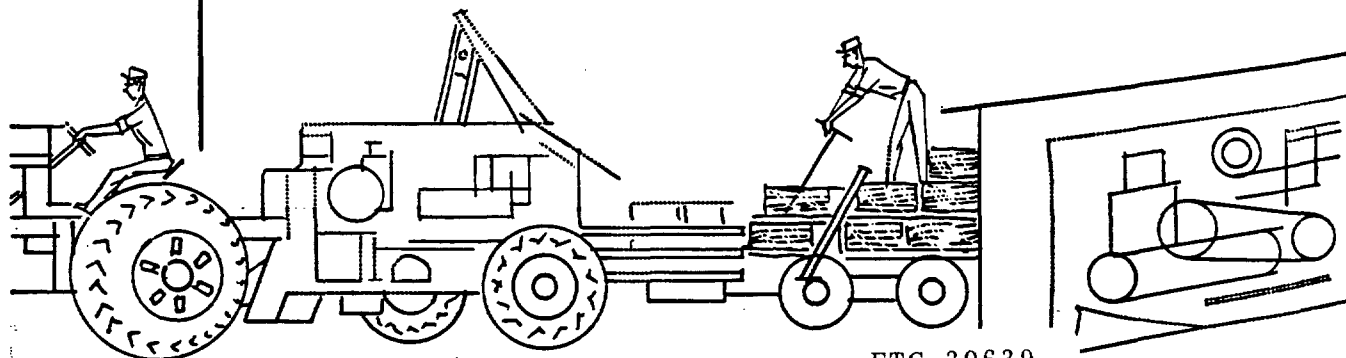
to assure enough good food for our growing population, estimated to reach 190 million by 1965 and well over 200 million by 1975. With the increasing use of farm products as industrial raw materials, supplying them in sufficient quantities is another urgent future "must." For these two reasons alone, the agricultural engineer has a more vital place in the nation's welfare than ever before.

Undaunted by what lies ahead, he is inspired by what his profession has done to develop more and better farm machinery, practical agricultural building designs and construction methods, effective soil and water conservation, pest and weed control, improved fertilizing methods and better ways and means to process agricultural products for market.

A Dynamic Partner

Aside from direct contributions to productive, profitable and more enjoyable life on the farm, the agricultural engineer has been a dynamic partner of specialists in fields like agronomy, health and sanitation, farm equipment design, rural electrification, livestock and produce transportation, communications, salesmanship and management.

His practical applications of basic engineering principles and concepts have helped make possible a doubling and redoubling of farm



ETC 30639

of Abundance

Society of Agricultural Engineers is "Looking to the Future"

worker efficiency. Today 13 percent of the country's population can raise the food and fibre needed for a nation containing six times more people than a century ago, when 85 percent of our citizens labored on farms.

The growth of agriculture's mechanization is undoubtedly its most remarkable advancement since the ASAE was founded and the profession of agricultural engineering became firmly established.

A single farm worker with one tractor now raises as much food as his grandfather with a dozen horses. So numerous and varied are the different farm machines that investments in them are approaching a national total of \$18 billion.

Far from conceding that modern farming methods have reached the ultimate, agricultural engineers have their sights set and their mental and physical sleeves rolled up to tackle a variety of fresh problems. Some are extensions and continuations of those already partly solved. Others are forthright pioneering.

Practical applications of nuclear forces or atomic radiation may have few possibilities on the farm today, but who knows what tomorrow could bring? If solar energy can be utilized at last, agricultural engineers want to see it at work for the farmer. Regardless of the extent to which automation may be adapted successfully

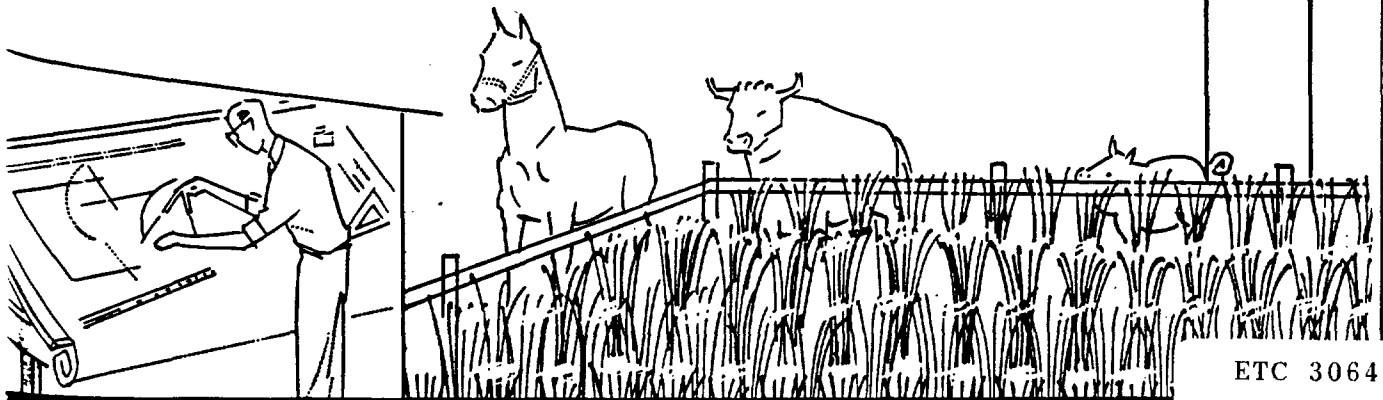
to the farm of the future, no efforts will be spared in exploring all possibilities of such developments as they materialize.

In more immediate directions, the agricultural engineer is concerned with problems such as better tractor designs and testing methods, forage handling, planting and fertilizer-placement machinery, weed and pest elimination, agricultural product processing, frost control, irrigation, farm building design and the more efficient use of petroleum products and electricity in rural areas.

More Engineers Needed

The number, variety and nature of these and other problems related to better farming indicate the urgent need for more professional manpower. An estimated 1,000 new agricultural engineers per year are required, as compared with only 300 now graduating annually from the 45 colleges and universities in the United States and Canada which offer degrees in agricultural engineering.

While the annual ASAE meeting theme of "Looking to the Future" will include concentration on its manpower problem, it is a foregone conclusion that the Society and its members will continue to make significant contributions to a more vigorous and prosperous America by helping the farmer. #





Polling All Voters

To preserve our freedom, we Americans must vote in all elections

By Thom Yates

IN THE FOUR YEARS between President Eisenhower's re-election last November and the selection of his successor in 1960, some eight million Americans will reach voting age and so will be eligible to vote in their first Presidential election.

Instilling in these citizens the voting habit—making certain that they cast ballots in *every* election and not just every four years when national offices are at stake—is a project that already is commanding the attention of many individuals and groups, including business and industry.

In its role as nonpartisan clearing house for greater citizen participation in local and national political affairs, The American Heritage Foundation is spearheading the drive. The Foundation is disturbed that voters turn out in relatively large numbers for Presidential elections but then virtually desert polling places for four years until attracted again by the glamour of another Presidential contest.

No one realizes better than The American Heri-

tage Foundation that it will not be easy to get new voters to the polls in 1960 and continue to get them there in every local, county, state and national election. Assistance of various kinds will have to come from many sources.

Here's what The Foundation wants to do to dispel the prevalent voter apathy:

1. Leave no stone unturned to make sure that first-voters go to the polls in overwhelming numbers.

2. Have updated the outmoded state voting laws that discourage and in some cases actually disfranchise large numbers of voters.

3. Emphasize that local, state and other national elections are just as important—and perhaps even more so—than Presidential balloting.

4. Erase the term "off-year election" from our national vocabulary. There is no such thing as an "off-year" when it comes to voting, The Foundation argues. Every election is important. (This year local elections are being held in all but seven states and in almost 700 cities of 10,000 or more popula-

tion. In April, Texas held a special election, on which hinged control of the United States Senate.)

An added reason for concentrating on first-voters is that surveys show that, as a group, younger people (between the ages of 21 and 29) have the poorest voting record and usually show the least interest in elections.

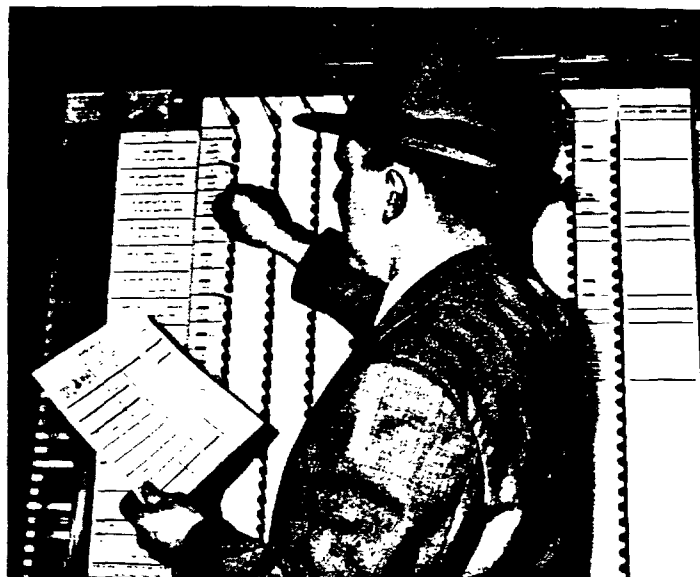
In fairness to the 21-to-29-year-olds and all other age groups, however, it is a fact that indifference and apathy are not entirely responsible for the nation's poor over-all voting record. There are millions of Americans who *want* to vote but are barred from doing so by antiquated laws and regulations.

Millions Not Voting

In the 1956 general election, for example, a record 62 million-plus citizens went to the polls in the Eisenhower-Stevenson rematch. But there were more than 17 million additional Americans of voting age who could not vote—in virtually every case through no fault of their own.

The biggest segment of this total—some six million people—were prevented from voting because they had moved across state or county lines during 1956 and so did not meet residence requirements. The second biggest group, numbering about five million, did not cast ballots because of personal illness or hospitalization. The third largest bloc—a group that is of direct interest to business and industry—was made up of the 2.6 million people The Foundation estimates missed voting because they were away from home on commercial travel.

"Many state voting regulations were established in the last century and have not kept pace with the rapidly changing social and economic pattern of our population," says John C. Cornelius, retired Minneapolis advertising agency executive who is president of The American Heritage Foundation.



Instilling the voting habit in younger people is a goal of The American Heritage Foundation.



Above, absence from home on commercial travel prevented more than 2½ million people from voting in the 1956 national election. . . . Left, absentee balloting—even by servicemen—is possible in many states "only with considerable difficulty."



He cites as a handy example the fact that 1,200 civilian workers at the Dugway (Utah) Proving Ground went voteless last November because of an old state law which disfranchises residents of military reservations.

The Foundation is in no way dictating specifically how the various states should update voting laws. It is, however, suggesting that each legislature review its state voting laws and requirements and revise and streamline them where necessary. The Foundation urges such possibilities as:

Changing voting hours to fit better local needs; consolidating election dates as they affect state and county offices, courts, bond issues, etc.; relocating polling places and perhaps setting up mobile facilities for registration and voting; unifying dates and standardizing practices for registration in the various states; standardizing counting and reporting of ballots; restudying "the whole matter of primaries to make them perform the function for which they were intended;" and simplifying absentee voting—"again a new condition in our country."

HOW THE STATES RANKED IN PERCENTAGE OF CIVILIANS OF VOTING AGE THAT CAST BALLOTS IN THE 1956 PRESIDENTIAL ELECTION

Rank	State	Percentage	Rank	State	Percentage
1	Idaho	77.3	25	Nebraska	66.8
2	Connecticut	76.6	26	Wisconsin	66.6
3	Utah	76.1	27	New York	65.5
4	Massachusetts	75.3	28	Pennsylvania	65.0
5	New Hampshire	75.2	29	California	65.0
6	Rhode Island	74.5	30	Ohio	64.9
7	Iowa	74.1	31	Nevada	64.5
8	Illinois	72.5	32	Maine	64.5
9	Indiana	72.4	33	Oklahoma	64.0
10	West Virginia	72.4	34	New Mexico	62.1
11	Montana	72.3	35	Kentucky	56.7
12	South Dakota	72.2	36	Maryland	54.8
13	Delaware	71.5	37	Arizona	49.8
14	Washington	71.4	38	Florida	48.4
15	New Jersey	70.1	39	North Carolina	47.6
16	Colorado	69.6	40	Tennessee	46.0
17	Wyoming	69.0	41	Arkansas	39.9
18	Vermont	68.6	42	Texas	38.1
19	Oregon	68.4	43	Louisiana	37.2
20	Minnesota	67.8	44	Virginia	34.2
21	Kansas	67.7	45	Georgia	30.4
22	Missouri	67.4	46	Alabama	28.5
23	Michigan	67.1	47	South Carolina	24.6
24	North Dakota	67.0	48	Mississippi	22.1

NATIONAL AVERAGE 60.7

Presently five states do not allow absentee balloting by civilians. One permits no absentee voting by either civilians or members of the armed forces. In many states where servicemen and servicewomen are permitted to vote by mail, The Foundation reports, balloting is possible "only with considerable difficulty."

Registration Complex

The complexity of annual registration in many states and localities places an "undue hardship" on millions of voters, Mr. Cornelius says. He points out that only 10 states have full permanent personal registration, although 35 others have a modified form of it.

Do states which make it comparatively easy for citizens to register and vote have more residents go to the polls? The record of 1956 indicates that they do.

Idaho topped all states in getting the highest percentage (77.3%) of its voting population to the polls last November. Connecticut was second with 76.6%. Idaho has permanent registration, requires residence of only six months in the state and 30 days in the county, and allows registration up to three days before election. Connecticut also has permanent registration, requires residence of one year in the state and six months in the town, and allows registration until about two weeks before election.

In contrast, the two states with the poorest voting record (Mississippi and South Carolina) require residence of two years in the state and one year in the county, have only modified permanent registration, and make the payment of a poll tax a condition for voting.

If it can succeed in its efforts, The Foundation feels that it will be well on the way to getting many more potential voters to the polls.

As President Cornelius puts it, "We must never lose our right to a free secret ballot through our failure to vote whenever we have the opportunity. If we can impress on our new voters the importance of forming the voting habit right from the start, this won't happen. At the same time, we will be proving to our allies that we treasure the freedom of expression that is ours and we will be showing our potential enemies a matchless national strength and unity." #

Partners in Progress

The formal opening of the new Ethyl Corporation of Canada Limited manufacturing plant marks another achievement in the growth of a country and a company.

In this special section, ETHYL NEWS reports on the events held in connection with this significant milestone.

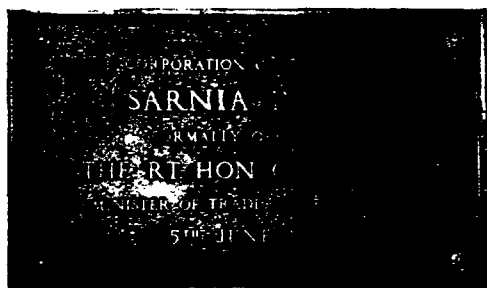


**ETHYL CORPORATION
OF CANADA LIMITED**

ETC 30644

Plant Openin

Official activities include a luncheon for
Sarnia's business and civic leaders
and tours of the new facility



Above left, Alan C. Tully and Oscar B. Lewis, president and vice president, respectively, of Ethyl of Canada, watch C. D. Howe, Minister of Trade and Commerce, unveil the bronze plaque which marks June 5 as official plant opening day . . . Left, the plaque itself which will be mounted in the plant reception room . . . Above, Robert T. Edgar, plant manager, welcoming guests at the luncheon.

ETC 30645

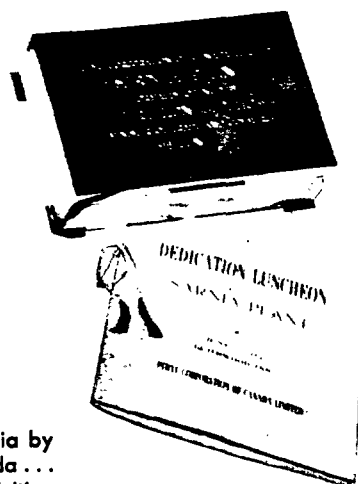
At the luncheon head table were Msgr. J. A. Cook, who pronounced the benediction; Stanley Wilk, So Chamber of Commerce president; Gregory A. Hogan, acting mayor of Sarnia; Alan C. Tully, Ethyl of Can president; C. D. Howe, Minister of Trade and Commerce; Robert T. Edgar, Ethyl of Canada plant manager; B



in Chemical Valley



C. D. Howe, Minister of Trade and Commerce, is greeted on his arrival in Sarnia by Robert T. Edgar, plant manager, and Alan C. Tully, president, of Ethyl of Canada . . . Right, a silver cigarette box presented to Mr. Howe as a memento of the day's activities, and a copy of the luncheon program.



THE NEWEST SETTLER in Ontario's Chemical Valley became an industrial citizen of that flourishing area on June 5 when the new Ethyl Corporation of Canada Limited manufacturing plant was formally opened.

Actually, the plant has been supplying antiknock compounds to refiners throughout Canada since last fall when it went into production. At the recent ceremonies, however, it was officially greeted—not only as a valued newcomer among the petroleum and chemical plants on the banks of the St. Clair River in and near Sarnia but also as a "welcome addition to the Canadian industrial scene." In join-

ing the Canadian oil industry, the Ethyl of Canada plant takes its place in Chemical Valley alongside the refineries of such well-known companies as Imperial Oil, Canadian Oil and Sun Oil.

Activities marking the formal plant opening included a luncheon for more than 230 business, industry and civic leaders and guided tours of the new manufacturing facility.

At the luncheon, at which Robert T. Edgar, Ethyl of Canada plant manager, acted as host and presided, the Company and its manufacturing operations were welcomed by local, provincial and national government officials. The featured speaker

L. Cathcart, Ontario's Minister of Travel and Publicity; Oscar B. Lewis, Ethyl of Canada vice president, who introduced Mr. Howe; W. D. Sinclair, reeve of Moore Township where the plant is located; J. W. Murphy, member of Parliament; and Rev. F. G. Hardy, who gave the invocation.





Upon arrival at the plant, guests enter the office building to start on a tour.

Plant Opening in Chemical Valley

was C. D. Howe, Minister of Trade and Commerce and Minister of Defense Production. He was introduced by Oscar B. Lewis, Ethyl of Canada vice president.

Mr. Howe, whose remarks are condensed on pages 14 and 15 in this special section of ETHYL NEWS, unveiled a bronze plaque marking June 5 as the formal plant opening day. In his talk, the Minister of Trade and Commerce pointed out that while the name "Ethyl" is not new to Canada, the plant is new in every respect. He emphasized that it is the first plant for the manufacture of antiknock compounds in either North or South America, outside of the United States.

"After some 30 years of reliance upon sources

outside of this country, refiners now have a dependable local source of supply of an ingredient that is essential in modern high-octane gasolines," Mr. Howe told his audience.

In responding to Mr. Howe's remarks and thanking him for formally opening the plant, Alan C. Tully, Ethyl of Canada president, told the veteran Canadian government official that the plaque he had unveiled would be mounted in the plant reception room.

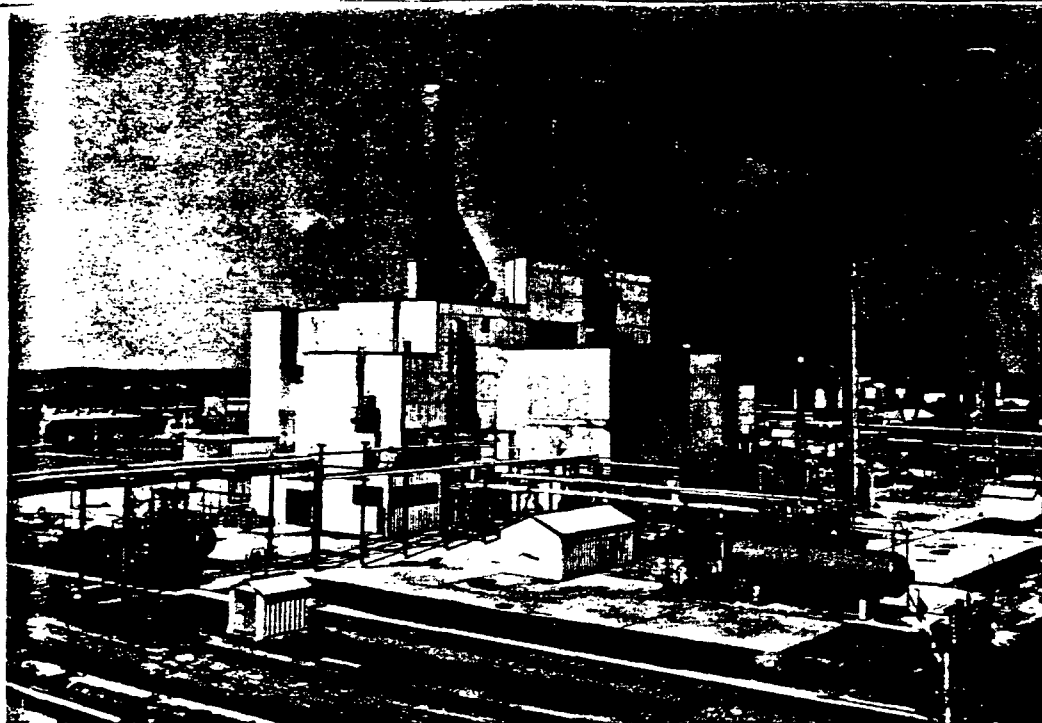
Following the luncheon, guests were taken by bus to the plant where they were conducted on guided tours. At the conclusion of the tours, they witnessed a presentation of the effectiveness of "Ethyl" fluid in a demonstration engine. #

A. J. Prell, Ethyl of Canada plant engineer, explains water purification equipment to one of the touring groups of industry and civic leaders.



J. H. Shirriff, points out facilities for loading antiknock compounds into Ethyl of Canada tank cars for delivery to the nation's oil refiners.



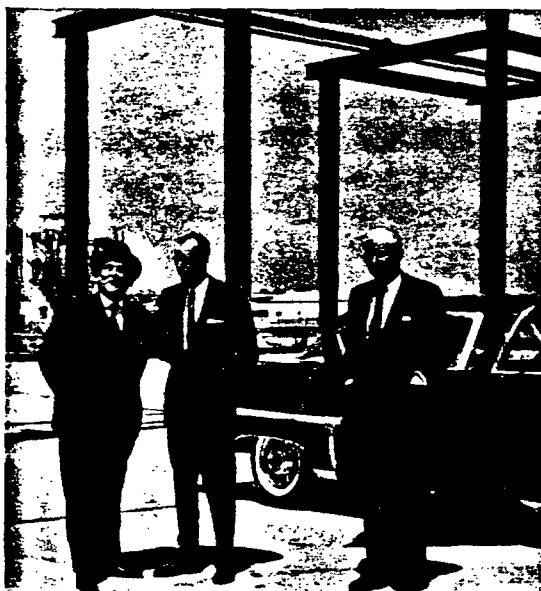


The new Ethyl of Canada manufacturing center (above) is the only plant producing antiknock compounds in North or South America, outside the United States.

Right, Maurice Sivers describes a step in manufacturing operations to a group that has paused in its inspection of the main process building.



Below right, C. A. Parkinson, of Ethyl of Canada, explains the effectiveness of "Ethyl" fluid by using a demonstration engine . . . Below, Robert T. Edgar, plant manager, (center) describes the new facility to C. D. Howe, Minister of Trade and Commerce, and J. B. Barrington, Polymer Corporation president.



What Ethyl Means to Canada

By The Rt. Hon. C. D. Howe*
Minister of Trade and Commerce

ONE OF THE REWARDING FEATURES of my job is that it enables me to get to Sarnia every once in a while. I always look forward to coming to this progressive city for a number of reasons, but particularly because it is here that a person can see as well as sense the tremendous industrial growth that is taking place in Canada.

Sarnia's busy Chemical Valley is more imposing and stimulating each time I see it. All Canada takes pride in the great concentration of petroleum, chemical and other plants that line the shore of the beautiful St. Clair River here.

This is a dynamic, growing community of industrial plants working together—and often in competition with each other—to provide many of the products that Canada needs as it continues to play its role of leadership among free nations.

This afternoon, we celebrate the formal opening of the new Ethyl Corporation of Canada Limited manufacturing plant. I said *new* plant—and it is just that. But Ethyl itself is by no means a new name among Canada's great industries. Before there was Ethyl Corporation of Canada Limited there was

* The accompanying article is adapted from an address by Mr. Howe at the formal opening of the Ethyl Corporation of Canada Limited manufacturing plant near Sarnia, Ontario, June 5.

**Cabinet member speaks at
formal plant opening—sees
Ethyl of Canada playing more
vital role in country's progress**

a predecessor company called Ethyl Antiknock, Limited. And before that there was a Canadian sales organization of Ethyl Corporation, the U. S. company. Canadians have been using gasoline improved by the Ethyl product ever since 1927. So you see, Ethyl knows Canada and Canada knows Ethyl.

While I don't begin to qualify as an expert on the equipment at the Ethyl plant or the processes employed, I am in a position to know something of the meaning and significance of the plant to each one of us and to the nation as a whole.

The people who work for it are the chief assets of any corporation, no matter how many dollars it may have in its reserve fund. More than 100 Sarnia area residents work at Ethyl. Admittedly, that does not rank Ethyl of Canada among the giants of the

Part of busy Chemical Valley, with the new Ethyl of C



nation's industries, but here are 100 local people enjoying gainful, year-round employment and thus able to contribute to the prosperity and progress of their community, province and nation.

But payroll is not the only financial impact the Ethyl of Canada plant is making on the community and the nation as a whole. I am informed that as a matter of policy the company buys many of the products and services it needs locally.

Like all industries, Ethyl also pays its fair share of taxes. That means increased revenue to the community, since the site on which the plant stands was formerly comparatively unproductive insofar as tax money is concerned.

The Ethyl plant is an asset to the community in other ways. It is a safe, clean, pleasant place to

Mr. Howe addressing his audience of business, industry and civic leaders at plant opening luncheon.



in the center foreground. The St. Clair River lies beyond.



work; modern in design and attractively landscaped. The company pays salaries and has employee benefit plans that are in keeping with those of other local industries. And here is a point I know is important to the people of this area—Ethyl of Canada has invested something on the order of a half a million dollars in the very latest and best anti-pollution equipment so there can be no possible contamination of the air or water from its operations.

Speaking both as Minister of Trade and Commerce and as Minister of Defence Production, I can assure you that the Ethyl of Canada plant is a welcome addition to the Canadian industrial scene. Its product is essential in peacetime and would be absolutely vital in the event of another war.

The Ethyl of Canada plant is the only establishment of its kind in Canada; in fact, it's the only anti-knock compound manufacturing plant in either North or South America outside of the United States. This fact is a testimonial to Canada.

With the Ethyl plant in operation as it has been since last fall, very likely the gasoline you buy now is totally made in Canada by Canadians. After some 30 years of reliance upon sources outside of this country, refiners now have a dependable local source of supply of an ingredient that is essential in modern high-octane gasolines.

Growth Ahead

It is encouraging to refiners, as I know it must be to the people of the Sarnia area also, that Ethyl of Canada has an eye to the future. There is no question that the progressive Canadian petroleum industry is going to continue to grow in the years ahead. Ethyl of Canada has anticipated this growth. Its plant site comprises about 100 acres, but only about one-third of the land is being utilized at present. That leaves ample room for expansion of facilities and enlargement of production capacity as that might become necessary in the future. And I am informed that the plant has been designed so that any growth of either facilities or capacity can take place without any interruption in normal operation.

To sum up then, the Ethyl of Canada facility is far more than just a pleasing array of brick and cement. It holds special significance for all of us: For the Sarnia area citizen; for the nation as a whole; and for the oil refiner, be he located here in the great "Chemical Valley" or two-thirds of a nation away in British Columbia. #



Robert T. Edgar, plant manager, welcoming a group of guest oilmen on their arrival.



Before starting out to see how "Ethyl" antiknock compound is made, the visitors heard Mr. Edgar describe plant operations. Those listening here include A. E. Osborough, W. I. Taylor and L. R. Woolsey, all British American Oil; A. Lawrence, Canadian Oil; M. E. Wigh, Canadian Petrofina; C. M. Beamer, Dr. C. H. Caesar and H. I. Magee, Imperial Oil; S. C. Burnet and Vice Presidents R. P. Ritchie and A. L. Wilson, all Shell of Canada; and V. Wiebe, Standard Oil of British Columbia vice president.

Manufacturin

Canadian oilmen inspect new plant and visit laboratories in Detroit

Debarking from a bus at the plant are R. L. Althouse, Royalite president; W. O. Twaits, executive vice president, Imperial; S. C. Nickle, Anglo American Exploration president; G. Urwin, Federated Co-operatives president; R. J. Hull, Cities Service president; M. S. Beringer, British American Oil president; Alan C. Tully, Ethyl of Canada president; L. W. Lee, Husky Oil executive vice president; R. T. Edgar, plant manager; A. F. Down, British Petroleum (Canada) president; W. H. Rea, Canadian Oil president; H. J. Philp, Ethyl of Canada; C. Hay, Royalite executive vice president; O. B. Lewis, Ethyl of Canada vice president; and J. R. White, Imperial Oil president.

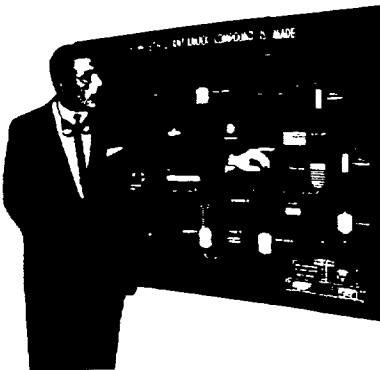
EXECUTIVES of oil companies north of the border were guests of Ethyl Corporation of Canada Limited for two days during each of the three weeks preceding the formal plant opening ceremonies at Sarnia.

Tours of the new manufacturing center and trip to the Ethyl research laboratories in Detroit were arranged to give the oilmen a clearer understanding of how "Ethyl" antiknock compound is made and to show them highlights of research program designed to serve Canada's expanding oil industry.

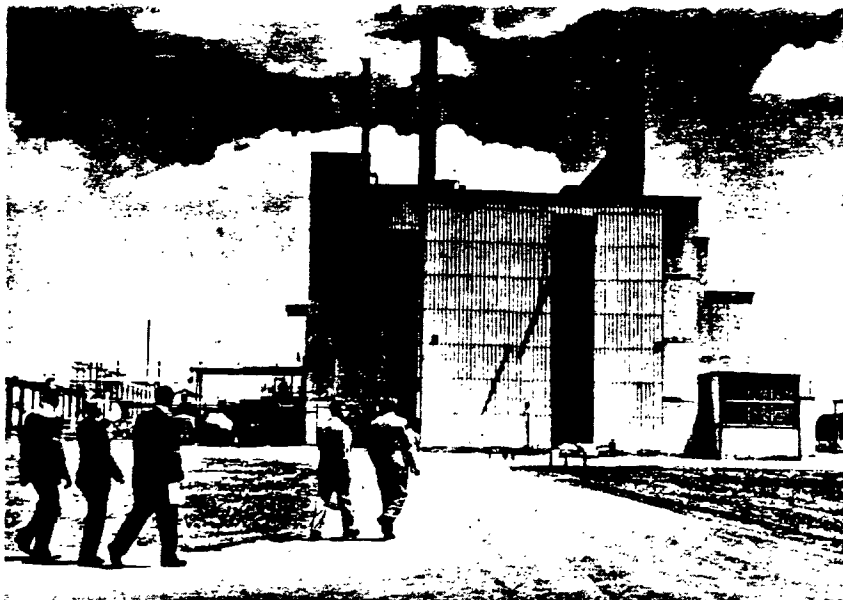
The pictures on these pages are of representative

ETC 30651





Plant processes being explained by C. L. Weeks, who used an illuminated chart.



A touring group heads for the plant's central process building.

and Research on Review

groups being escorted through the new plant and attending laboratory lecture-demonstrations.

With the plant in full operation, oilmen were taken through the offices, shops and process buildings. Guides explained how Canadian raw materials and other intermediate chemicals are manufactured into finished "Ethyl" fluid by the most modern equipment in use anywhere in the world.

Research projects described at the laboratories involve basic combustion, deposit effects, spark plug fouling, fuel injection, 11 to 1 compression ratios, antioxidants and diesel fuel additives. #

At the siding where tank cars are loaded: Dr. C. H. Caesar, Imperial; A. L. Wilson, Shell of Canada; G. R. Mills, Ethyl of Canada; C. M. Beamer, Imperial; G. S. Hanna, Canadian Petrofina; M. C. Shonfield, Ethyl of Canada, and E. C. Asseltine of Sun.



Above, key equipment used in making TEL is explained by G. R. Mills, Ethyl of Canada (left), to C. M. Beamer, Imperial Oil; G. S. Hanna, Canadian Petrofina; and E. C. Asseltine, Sun . . . Below, noting that Canadian pig lead is used at the plant are R. W. Dunlop, Imperial, and J. R. McMurray, Canadian Oil. Walking beyond are E. F. Diedrich, Ethyl of Canada; W. W. Yeates, Imperial; and J. K. Jamieson, Imperial vice president.



ETC 30652

Manufacturing . . . on Review



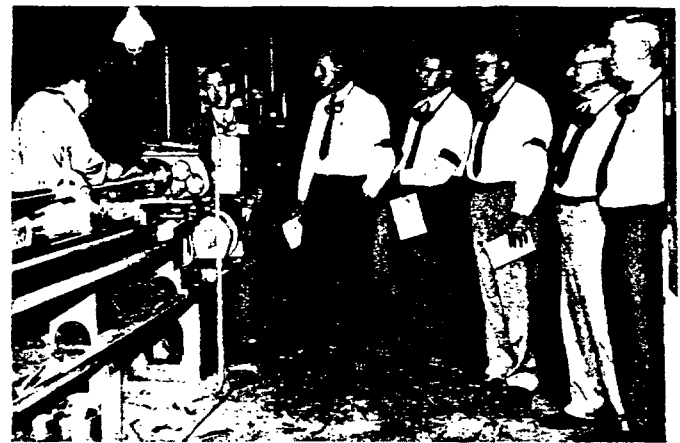
Listening to A. J. Prell, Ethyl of Canada, are M. E. Wight, Canadian Petrofina; H. L. Magee, Imperial; S. C. Burnet, Shell of Canada; A. Lawrence, Canadian Oil; F. G. Crosby, Sun; and V. Wiebe, Standard Oil of British Columbia.



Guide Prell pointing out features of metallic lead handling to L. J. Campbell, Husky Oil; W. Jeffrey, Anglo American Exploration vice president; F. G. Huyler, Ethyl of Canada and H. L. Benson, Federated Co-operatives.



Watching autoclave charging under the guidance of J. H. Shirriff (foreground) and G. E. Hayes and P. B. MacEwen (left), all Ethyl of Canada, are J. G. Light, McColl-Frontenac; Dr. G. W. Gurd, Imperial Oil; A. C. Morrison, Anglo-Canadian Oils; and J. W. Morgan, British American Oil.



Shop facilities were pointed out by C. Crowdis, Ethyl of Canada, to E. F. T. Stevens, Royalite; J. A. Cogan, Imperial Oil director; M. A. Schutz, executive vice president, Wainwright Producers & Refiners; E. A. Bence, vice president, Standard Oil of British Columbia; and A. G. Farquharson, vice president, McColl-Frontenac Oil.

Showing interest in auxiliary installations are L. D. Fraser, Imperial director; J. M. Courtright, Shell of Canada; C. P. Warkentin and B. C. Kitchen, Imperial; and R. C. West, Canadian Oil vice president. Their guide is J. H. Shirriff, Ethyl of Canada.

Silhouetted against plant storage facilities are J. G. Light, McColl-Frontenac; V. E. Sicks, Cities Service vice president; P. B. MacEwen Ethyl of Canada; A. C. Morrison, Anglo-Canadian Oils; J. W. Morgan, British American Oil; Dr. G. W. Gurd, Imperial; and J. H. Shirriff, Ethyl of Canada.



... Research on Review



Among those listening to a welcome by R. K. Scales, the Laboratories' general manager, are H. J. Gibson, Ethyl; W. I. Taylor, British American Oil; W. W. Yeates, Imperial; H. L. Magee, Imperial; S. C. Burnet, Shell of Canada; V. Wiebe, Standard of British Columbia; O. B. Lewis, Ethyl of Canada; J. M. Courtright, Shell of Canada; and F. G. Crosby, Sun Oil.



The Ethyl Corporation Research Laboratories in Detroit where Canadian oil executives saw and heard explanations of fuel and engine studies.

In one tour group were J. Kalmacoff, Jr., Northern Petroleum; D. L. Campbell, British American Oil vice president; Dr. G. W. Gurd, Imperial; O. B. Lewis, Ethyl of Canada; A. G. Farquharson, McColl-Frontenac; C. W. E. Miles, Imperial; J. T. McDowell, Cities Service vice president; B. W. Pawson, Consumers' Co-op; A. C. Morrison, Anglo-Canadian Oils; F. G. Huyler and H. J. Philp, both Ethyl of Canada; J. W. Morgan, British American Oil; R. T. Edgar, Ethyl of Canada; E. A. Bence, Standard of British Columbia; B. F. Penrose, Ethyl of Canada; B. Goulston, Imperial; H. L. Benson,

Federated Co-ops; J. G. Light, McColl-Frontenac; J. H. Main, Ethyl of Canada; Dr. K. A. West, Canadian Oil; E. F. T. Stevens, Royalite; L. J. Campbell, Husky; J. Dickinson, British American Oil; G. Davidson, Shell of Canada vice president; Dr. J. R. Patton, Canadian Petrofina vice president; V. E. Sicks, Cities Service; M. A. Schutz, Wainwright Producers & Refiners; W. Jeffrey, Anglo American Exploration; P. B. MacEwen, Ethyl of Canada; B. Brewster, Ethyl; J. A. Cogan, Imperial; A. C. Knight, Husky vice president and G. E. Hayes, Ethyl of Canada.





Basic combustion studies are described by Ethyl's E. B. Rifkin and R. C. Getoor to H. L. Magee, Imperial; E. A. Desmond, Jr., Ethyl; C. W. Matthews, Regent Refining; L. R. Woolsey, British American Oil; R. K. Scales, Ethyl; R. P. Ritchie, Shell of Canada; F. G. Crosby, Sun Oil; and A. Lawrence, Canadian Oil Companies.



E. G. DeWitt discusses Ethyl's lubricating oil and diesel fuel additives for J. H. Main, Ethyl of Canada; S. C. Burnet, Shell of Canada; C. M. Beamer, Imperial; W. I. Taylor, British American Oil; and J. R. McMurray, Canadian Oil.



Ethyl's J. A. Warren tells of engine deposit studies to J. M. Courtright, Shell of Canada; W. W. Yeates, Imperial; M. C. Shonfield, Ethyl of Canada; L. D. Fraser, Imperial Oil; M. E. Wight, Canadian Petrofina; and E. C. Asseltine, Sun Oil.



Hearing 11 to 1 compression ratio studies explained are J. B. Stephen, McColl-Frontenac; A. L. Wilson, Shell of Canada; J. K. Jamieson, Imperial; V. Wiebe, Standard of British Columbia; A. E. Osborough, British American Oil; and B. Brewster, Ethyl.

A. E. Felt, Ethyl, reports on fuel injection to W. O. Twaits, Imperial; W. H. Rea, Canadian Oil; A. C. Tully, Ethyl of Canada; A. F. Down, British Petroleum (Canada); E. A. Desmond, Jr., Ethyl; and C. Hay, Royalite Oil.

Work with spark plug fouling is detailed by C. A. Hall for V. E. Sicks, Cities Service; E. L. Tandrup, Ethyl; J. A. Cogan, Imperial; A. C. Morrison, Anglo-Canadian Oils; E. F. T. Stevens, Royalite; O. B. Lewis, Ethyl of Canada; D. L. Campbell, British American Oil; and A. G. Farquharson, McColl-Frontenac.



In a growing movement, industries and government agencies are banding together to help protect life and property...

In Case of EMERGENCY

AT 9:25 ONE MORNING last winter radio operators at a score of industrial plants along the Houston Ship Channel suddenly snapped to expectant alertness. An urgent message was coming over the airwaves.

Five minutes earlier, a voice crackled, there had been an explosion and fire at a nearby plant. Now that plant was asking others in the emergency network to stand by.

During the next 45 minutes, the stricken plant came on the air several times more. It called on various stations for specific items of fire fighting equipment and emergency supplies.

From up and down the Channel, cars and trucks loaded with foam powder, foam generators, hoses

and other needed equipment, and carrying industrial fire protection experts, converged on the fire scene. In no time at all, the Houston Ship Channel Industries Disaster Aid Plan was transformed from a blueprint for emergency action into a successful working reality.

Fortunately, this particular fire was soon extinguished. But the teamwork that was in evidence in this Houston situation is typical of a growing movement in highly industrialized areas throughout the country: Industries and government agencies are banding together to help protect life and property in case of emergency or disaster.

In different areas, these volunteer cooperative groups have different names, but in all cases their

"Dry runs" of emergency situations help train mutual aid systems to cope with actual disasters.



goals and aims are the same. In and around Charleston, W. Va., it's the Kanawha Valley Industrial Emergency Planning Council; in Houston, the Houston Ship Channel Industries Disaster Aid Plan; in Baton Rouge, La., the Mutual Aid System.

There also are similar organizations in existence or being planned in Texas City, Port Arthur and Orange, Texas; Kingsport, Tenn.; Harrison and Linden, N. J.; Worcester, Mass.; Niagara Falls, N. Y.; and in the industrial area of Marietta, Ohio, and Parkersburg, W. Va.

Ethyl Active

In both Houston and Baton Rouge, the Ethyl Corporation manufacturing plants are active members of the volunteer cooperative groups and Ethyl safety and fire protection experts serve on their governing staffs and committees.

As in so many worthwhile endeavors, oil companies are active participants in mutual aid organizations. When Ethyl representatives and equipment were called to the scene of the Houston explosion and fire, they found men and supplies there from, among others, Shell Oil and Shell Chemical, Eastern States Petroleum, Crown Central Petroleum and Sinclair Refining. Other oil industry members of the Houston group include Gulf Oil, Humble Oil & Refining, Phillips Chemical, The Texas Company, Warren Petroleum, and Lubrizol.

In the Linden (N. J.) Industrial Mutual Aid Council, Cities Service Oil, Esso Standard Oil and

Esso Research and Engineering are active participants. In Baton Rouge, Plantation Pipe Line, Interstate Oil Pipe Line and Esso Standard are included with Ethyl among some 35 cooperating agencies.

Wherever they are in existence, mutual aid systems are added protection and insurance against widespread damage to industrial installations and private property. They prevent injury and death.

The need for mutual aid systems was underscored by the terrifying and costly Texas City explosion and holocaust of 1947. Now such organizations are prepared to act quickly and efficiently in case of enemy attack or other disaster. The Baton Rouge organization, to cite just one, has functioned during a hurricane, several floods, two train wrecks and an industrial plant fire.

Most industrial plants, of course, have their own safety, fire protection and civil defense organizations and equipment. But there is always the chance that the equipment of even a well protected plant will be destroyed in a disaster.

Deterrent to Damage

In the case of localized emergencies, individual plants first call on their own staffs for assistance. Outsiders never come to help a stricken plant unless requested to do so. But the immediate availability of trained personnel and emergency equipment operating according to carefully laid plans provides an effective deterrent to widespread damage.

Mutual aid organizations work with local fire

Representatives of industry and government agencies work together to assure the success of mutual aid systems.



Radio provides the best communications in event of emergency.



ETC 30657



First aid treatment in the field and evacuation of casualties is an important part of disaster aid plans.

and police departments, broadcasting stations and communications companies, public utilities, and National Guard, Civil Air Patrol and Red Cross units. Because of their importance in the national defense, they cooperate with Civil Defense officials in their organization and operation.

The Houston Ship Channel area, for example, has been designated a Civil Defense Zone because of the great concentration of vital industries located there. As a result, the local CD office not only helps train members of the Channel Disaster Aid Plan, but also acts as the coordinating agency in dispatching men and equipment to plants in trouble.

Efficient communications, of course, are one of the essential elements of any industrial mutual aid system. Many of the participants in the Houston plan maintain constantly manned radios on a special frequency. In other localities, telephones, "ham" radio operators and commercial broadcasting stations are used, but the trend is toward emergency radio channels as more frequencies and equipment become available.

Emergency Listings

So that they will know what equipment and personnel are available, members of a mutual aid plan have lists of the medical, first aid, fire fighting, communications, and other emergency equipment on hand at each of the member plants. When an emergency occurs that is too large for on-plant personnel to handle, a call for assistance goes out to the member next best located and equipped to help.

In Houston, for example, the list shows that Ethyl

has fire hose, an ambulance, inhalator, gas masks, foam powder, a foam generator, a passenger car, trucks, a crane, and 75 men and a nurse available for emergency duty. Other member companies in the Houston organization have equipment and personnel which adds up eight fire trucks, almost 40,000 feet of hose, 19 portable pumps, 12 portable light units, 33 foam generators, over 350,000 pounds of foam powder, 190 respiratory units, 100 trucks, 10 cranes, 17 tractors and bulldozers, 14 locomotive cranes, 400 feet of aluminum pipe, 10 miles of eight-inch coupling pipe, a 400-foot spill-boom, motor boats, five nurses and 700 firemen, first aid men, draftsmen and laborers.

Workable Plans

Through periodic organization meetings and "dry runs" of actual emergency situations, mutual aid systems develop workable plans for disaster control. In most groups, there are committees responsible for traffic control, communications, manpower and equipment, and plant emergency systems. These groups call on experts from civil and military agencies for advice and help in training and in actual emergency situations.

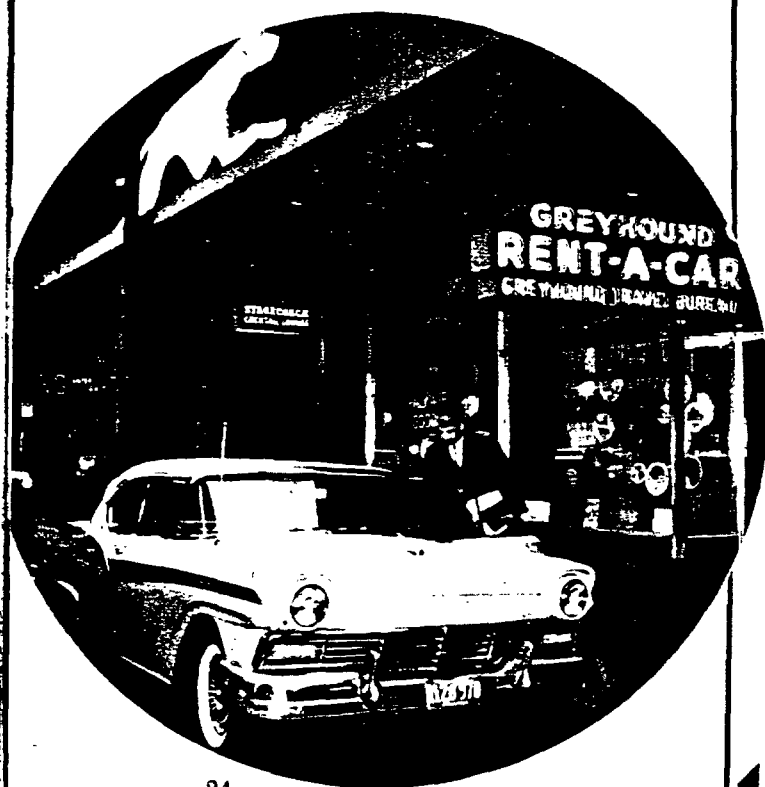
Cooperation, then, among industrial neighbors and government agencies is the keynote of mutual aid system success. Because of its proven value in actual emergencies and its importance in the security of local industrial areas and the nation as a whole, there are indications that the mutual aid movement will become more widespread in the years to come. #



Three Billion Mi

U-drive-it cars are in great demand to help businessmen get work done more conveniently

By Stanton P. Nickerson



24

KEYS TURN in ignition locks every day as thousands of businessmen start cars which they do not own. Far from doing anything illegal, these representatives of America-on-the-go are part and parcel of one of the most rapidly growing enterprises in motorized transportation—renting automobiles.

Although planes, trains or other public carriers may be chosen to travel long distances on business, it would be difficult if not impossible to carry out many assignments or complete trip objectives successfully without cars after destinations are reached. Rented vehicles are therefore playing an increasingly important part in helping busy personnel from such expanding industries as oil to accomplish their work.

A drilling equipment salesman from Tulsa who flies to a city like New Orleans arranges to have a rented car waiting for him there, so that he can call upon potential customers throughout Louisiana in the shortest possible time and with minimum expense. When a dozen New York executives of an oil company visit their Texas refineries, rented sedans reserved in Houston provide the most comfortable and flexible local transportation.

Business Tripling

The rent and "U-drive-it" car business has tripled every half dozen years since 1944 for an accumulative gain of 800 percent, thanks largely to the rising tide of businessmen taking advantage of this convenient and often essential service. In 1956, some 2,000 renting and leasing firms had fleets totaling about 250,000 vehicles. Operating close to three billion miles, they consumed better than 200 million gallons of gasoline.

◀ New cars for rent can be picked up at centrally-located depots.

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Miles for Rent

Car rental agencies are confident this trend will continue, so that collectively their income will reach the billion dollar level by 1962. This would mean 750,000 cars requiring some 600 million gallons of gasoline to drive nine billion miles annually.

There were fewer vehicles than this in the nation's entire automotive population when a handful of pioneers introduced horseless carriages for rent in a few scattered cities back in the linen duster and goggle days. Hiring an automobile and driving it was a novel and often costly experience until the venture grew to maturity by the mid-1920's.

Not even the depression checked its increasing acceptance, primarily because companies and businessmen obliged to cut expenses found that they could reap the benefits of economical motorized transportation by renting instead of buying. Since World War II, there has been a remarkable decade of growth rooted in the country's prosperity.

Most of the principal agencies with cars for hire today find that up to 75 percent of all customers want cars to help them with their work. This is especially true among two such large organizations as Hertz and Avis, which handle some eight million automobile rentals annually. Greyhound, newest of the major renting and leasing organizations, also is depending heavily upon the businessman as it plans to double its facilities this year.

Fully aware of what the modern businessman wants when he rents a car, agencies in the U-drive-it field spare no efforts to make their services attractive. The latest models are provided, maintained in first class condition and available with maximum simplicity, convenience and economy.

Time-Saving Innovation

The latest innovation is designed for the businessman to make the most efficient use of his time and efforts on the road. A typical customer can rent a new car from an agency in Seattle, drive south with stops along his way, and then turn the car in to the same agency's San Francisco station. There is usually no additional charge for this "Rent-it-here and leave-it-there" arrangement.

Tie-ins with airlines, railroads and bus companies mean that when a businessman buys his ticket, he can reserve a car at his destination. If he decides en route that he ought to have an automobile, hundreds of railroad terminals, airports and bus depots have either car renting desks or direct telephone lines to expedite his requirements.

Very little red tape is involved in renting a car. The applicant must have a valid driver's license, of course. In most cases he must be at least 21 years



◀ A New York businessman hires a car at Chicago's Union Station.

old, present routine evidence of credit standing and give an estimate of the extent and duration of his intended trip.

Charges vary somewhat, depending on the make and model of the automobile. Rates are lowest for Chevrolets, Fords and Plymouths, increasing for larger and more luxurious sedans, station wagons and convertibles. Leading agencies have cars available with radios, power steering and brakes, automatic transmissions and air-conditioning.

Short Rental Periods

A majority of people want a car by the hour, day or week. Operating expenses are usually included in the basic rate asked, together with insurance, plus an additional cents-per-mile-driven charge. If a customer buys gasoline, oil, or needs routine repairs during his trip, these costs are deducted when he settles his account. Credit cards simplify billings and payments.

In addition to those who need cars for short periods, many businesses are leasing fleets on a long term basis when there are economic advantages in doing so. The Daly Rental Service of Philadelphia, operating in 42 states, is a typical agency specializing in contracts of 18 to 24 months. A 26 percent increase in its accounts last year over 1955 is indicative of a growing interest in "Rent-A-Fleet" plans for extended periods.

Most rental companies find that businessmen buying gasoline for rented transportation select whatever brand and grade they prefer for their own cars, although some outlets specifically recommend premium to customers who hire models with high compression engines. Maintenance and repair needs coincide closely with those of privately owned automobiles. The average U-drive-it car is driven 14,000 to 20,000 miles annually before it is sold or traded in for a new one.

In somewhat the same way that freight trains are the principal source of railroad income, large vehicle renting companies look to their truck business for the most profits. Hertz, for example, has 20,000 trucks for renting and leasing. They bring in "nearly double the revenue from car rentals." Avis also owes much of its post-war stature to income from 5,000 trucks available to business and industry.

Much of the potential for the future growth of car renting companies lies with their established ability to keep up with the times.

As part of their efforts to build up additional business, majors like Avis, Hertz and the National Car Renting System of St. Louis are expanding and improving franchise and other coordinated arrangements with agencies in foreign countries. Such plans may be designed primarily to accommodate tourists, but American businessmen abroad—especially in Europe—will be among those benefiting. #

Below, a direct telephone line helps a customer get his U-drive-it car on short notice . . . Right, an Avis car is ready for this arriving air traveler.



ETC 30661

New Ethyl motion picture and instrumented cars contribute to a better understanding of...

FUEL INJECTION

THE CONTINUING EFFORTS of automobile manufacturers to improve the efficiency and performance of passenger cars has led recently to new interest in fuel injection as a method to distribute gasoline to engine cylinders. This interest has resulted, in part at least, from the increasing complexity of the carburetors required to satisfy the demands of modern, high-speed, free-breathing V-8 engines. It also has been prompted by the possibilities for lower octane requirement stemming from more uniform fuel distribution; lower fuel consumption; easier starting; and a quicker response to throttle which fuel injection may provide.

Because fuel injection is of direct interest to gasoline manufacturers as well as engine designers, Ethyl Corporation, in its liaison role between the two industries, has been studying this development. Now the Company is sharing its knowledge.

Ethyl's current contributions to a better understanding of fuel injection include a motion picture on the subject and instrumented fuel-injection-equipped passenger cars for use by oil refiners.

The motion picture, "Fuel Injection," is the latest addition to Ethyl's series of automotive films

designed for use by oil companies in training marketing personnel. Available in full-color and black-and-white, the motion picture covers first an engine's need for a fuel-air mixture and tells how fuel injection produces this mixture as compared with the carburetor method. It covers the function and operation of the injector nozzle, pump, metering device and air-intake manifold. It illustrates the pressure regulating mechanism and shows the two most commonly used flow systems.

Oil company research personnel may be interested in Ethyl's instrumented fuel injection cars—1957 Chevrolets—which are available for tests.

The instrumented cars, one in each of Ethyl's four regions, are operated by Ethyl representatives who have been trained in their use at the Company's Research Laboratories in Detroit. It is at these Laboratories that Ethyl engineers and fuel technologists are studying fuel injection.

As they are made available, the Ethyl cars provide an opportunity for oil company research men to become familiar with the mechanics of fuel injection and to test various motor fuels in them under a variety of actual operating conditions. #

The instrumented fuel injection automobiles are operated by Ethyl representatives who have been trained in their use at the Company's Research Laboratories in Detroit.



James M. Gill Named Plant Manager

JAMES M. GILL has been appointed manager of the new Ethyl Corporation plant under construction at Pittsburg, Calif., it was announced recently by John H. Schaefer, vice president in charge of manufacturing.

Mr. Gill is making his headquarters at the plant site in Pittsburg. The plant is scheduled to be completed and go into operation during the middle of 1958.

A native of Ruston, La., Mr. Gill has been associated with Ethyl Corporation since 1948 and has been located at the Company's Baton Rouge plant. He holds a BS in chemical engineering from Louisiana Polytechnic Institute and an MS in chemical engineering from Louisiana State University. #



James M. Gill

Gasoline Quality Surveys Improved

ETHYL CORPORATION's monthly survey of the antiknock quality of gasoline on sale at service stations has been improved in several important ways recently.

The survey has been broadened to include 57 cities instead of 53 as formerly. This was done by adding Des Moines and Davenport, Iowa, and Midland, Texas, to the survey and reporting New York, N. Y., and Newark, N. J. separately instead of combining them in Metropolitan New York-New Jersey as previously.

The survey now also presents data on the highest grade of gasoline for companies marketing more than one grade of premium. Although it does not show averages for the highest grade, the survey lists the octane number and TEL content of a number of representative samples on sale in various cities.

Ethyl's survey of the average research octane number and TEL content of premium and regular grade has been expanded to include approximately 1,000 gasoline samples purchased each month at service stations in the 57 marketing centers throughout the United States. #

Ethyl Advertisements Appeals to Women

SINCE WOMEN are driving the family car more and more these days... to the station... school... to shopping centers... and on vacation trips, it's natural that women also are doing much of today's gasoline purchasing. Men still determine the brand and grade that most families use, but very often it's the lady of the house who stops at the service station to have the tank filled and the car checked.

Because women are making many of the service station purchases, their opinion is a major factor in enhancing the prestige of service station men. With this in mind, Ethyl Corporation is publishing the advertisement which is reprinted on the back cover of this issue of ETHYL NEWS.

This advertisement is the second in a nation-wide series designed to contribute to a better understanding of America's service station men. It tells the ladies that service station men always are ready to help them... and give them road-long assurance that they never drive completely alone.

Leading national magazines—including *McCall's*—a publication read by more than 4½ million women—are carrying this message. #

FOR OUTSTANDING COOPERATION

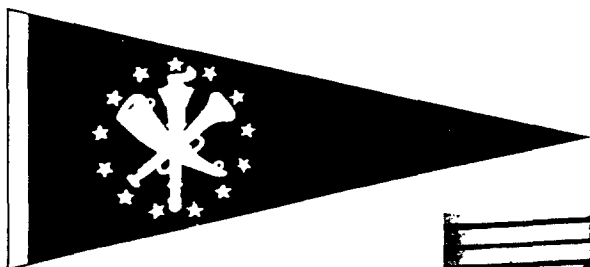
THE DEPARTMENT OF DEFENSE Reserve Award for "outstanding cooperation" toward military reservists and reserve activities has been awarded to Ethyl Corporation. The award, consisting of a pennant and a certificate of citation, was presented in New York in mid-June at a ceremony attended by executives of Ethyl and high ranking officers from all branches of the armed forces.

Rear Admiral Milton E. Miles, commandant of the Third Naval District, made the presentation in the name of Charles E. Wilson, Secretary of Defense. B. Bynum Turner, president

of Ethyl Corporation, accepted the award for the Company on behalf of its employees who have served in the armed forces and are continuing to serve in the reserves.

Admiral Miles complimented Ethyl for assisting employee-reservists in meeting their reserve obligations.

Elbridge B. Charlton, an employee at Ethyl's Baton Rouge, La., manufacturing plant and a radioman first class in the Naval Reserve, initiated the recommendation which resulted in the Company's receiving the recognition by the Defense Department. #



B. Bynum Turner, Ethyl Corporation president, accepts the Department of Defense award certificate of citation from Rear Admiral Milton E. Miles, commandant of the Third Naval District... Above, a reproduction of the pennant, which, with the certificate, comprises the award.





THEY'RE ALONE



BUT THEY'RE NOT UNATTENDED

ANYWHERE THEY GO, the ladies know they have a friend just down the road—the man in the service station.

The helpful way he has done his job has earned him the respect of all his customers—passing motorists and fellow townspeople.

He's an independent businessman who plays an important part in American life. His skill and training keep a nation on the road. His professional way of doing business is a credit to the oil industry. He's a man you can trust to take expert care of one of your major investments—your automobile.

With such a friend so close at hand, no wonder the ladies feel at ease when they're on the road!

There are over 200,000 men like this ready to help you, and every motorist, on every highway and byway throughout America. Knowing that trained, experienced and friendly help is as near as the next service station makes motoring a carefree pleasure.

America's service station teams give today's motorists the road-long reassurance that they never drive completely alone.



ETHYL CORPORATION
New York 17 • New York

Manufacturers of "Ethyl" antiknock compound—used by oil companies where to improve their gasolines.

ETHYL'S ADVERTISING SERVES THE OIL INDUSTRY. SEE PAGE

ETC 30665

Ethyl News

JULY-AUGUST 1957



ETC 30666

Ethyl News

JULY-AUGUST 1957



THE COVER: The trim cabin cruiser cutting across the sparkling water is one of the millions of power craft that provide recreation for followers of one of America's fastest growing pastimes. For what the United States Power Squadrons are doing to promote safe and competent boat handling, see "Spreading Nautical Know-how," pages 9-11.

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.

Edward L. Shea, Chairman of the Board
B. Bynum Turner, President
William R. Perdue, Jr., Vice President and Treasurer
Herbert A. Savage, Secretary

Richard F. Cook, Editor, ETHYL NEWS
Stanton P. Nickerson, Associate Editor

ETHYL NEWS welcomes articles submitted from outside sources.
Opinions expressed in signed articles are the authors'.
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ETHYL NEWS will be granted.

ETC 30667

Sooner Celebration

Elaborate festivities mark the fiftieth anniversary of Oklahoma's statehood

By J. C. Malone

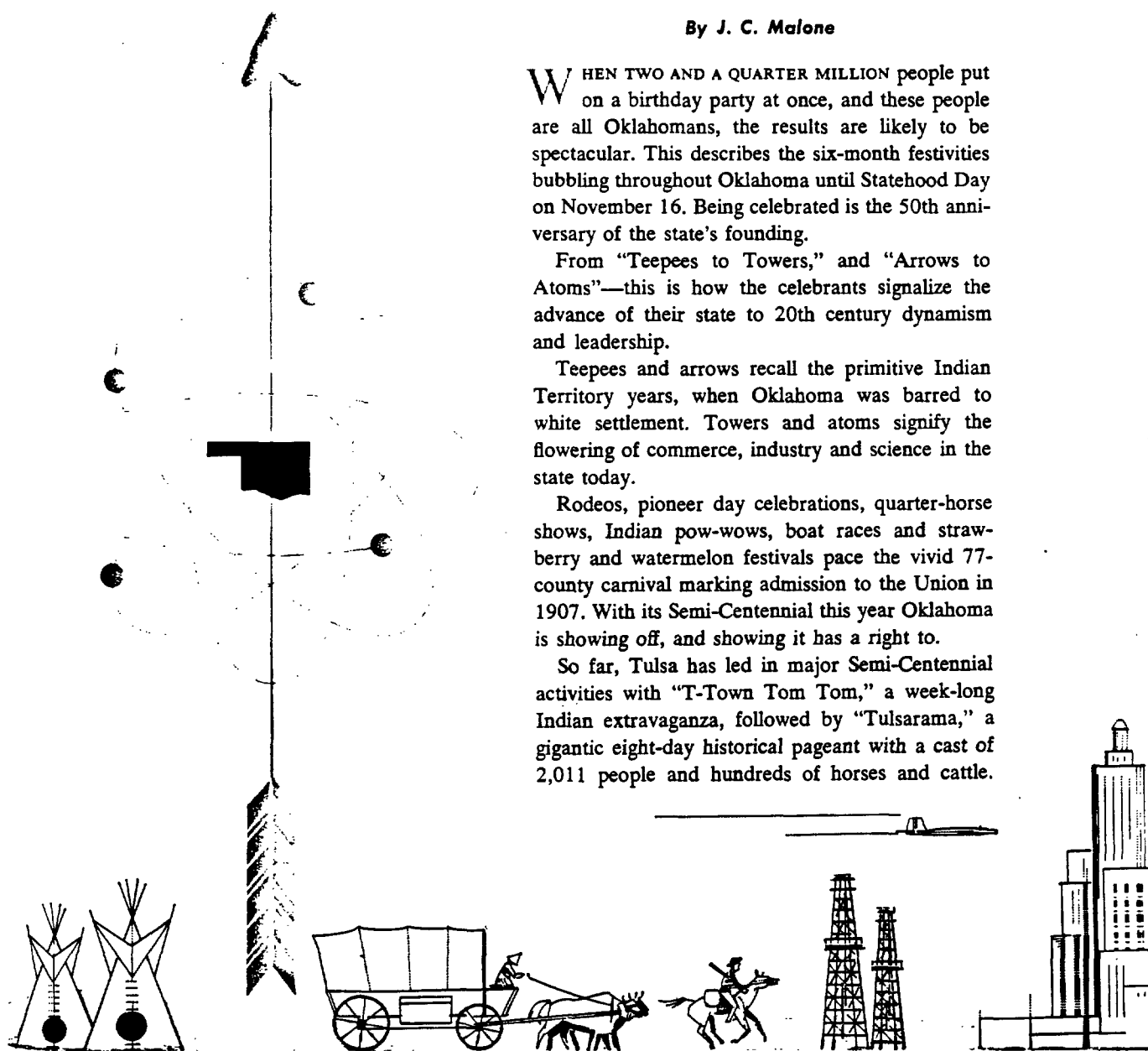
WHEN TWO AND A QUARTER MILLION people put on a birthday party at once, and these people are all Oklahomans, the results are likely to be spectacular. This describes the six-month festivities bubbling throughout Oklahoma until Statehood Day on November 16. Being celebrated is the 50th anniversary of the state's founding.

From "Teepees to Towers," and "Arrows to Atoms"—this is how the celebrants signalize the advance of their state to 20th century dynamism and leadership.

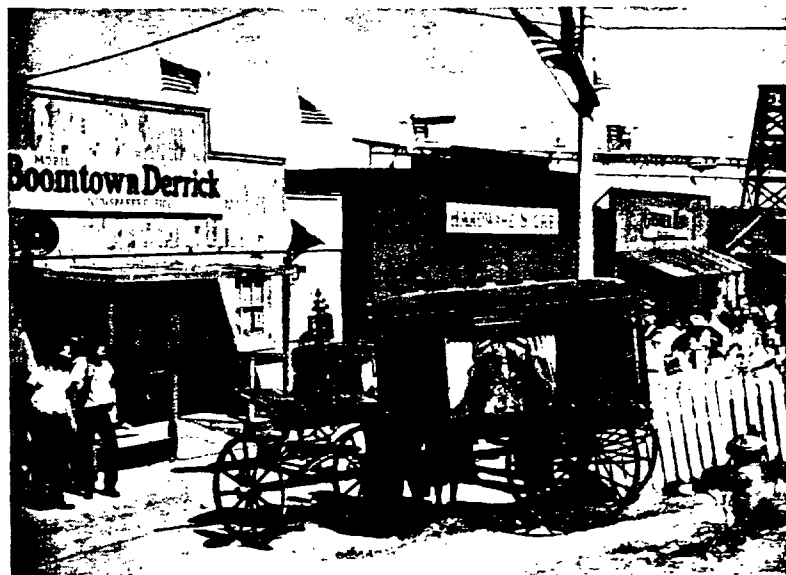
Teepees and arrows recall the primitive Indian Territory years, when Oklahoma was barred to white settlement. Towers and atoms signify the flowering of commerce, industry and science in the state today.

Rodeos, pioneer day celebrations, quarter-horse shows, Indian pow-wows, boat races and strawberry and watermelon festivals pace the vivid 77-county carnival marking admission to the Union in 1907. With its Semi-Centennial this year Oklahoma is showing off, and showing it has a right to.

So far, Tulsa has led in major Semi-Centennial activities with "T-Town Tom Tom," a week-long Indian extravaganza, followed by "Tulsarama," a gigantic eight-day historical pageant with a cast of 2,011 people and hundreds of horses and cattle.



The state officially observed its fiftieth birthday at the Semi-Centennial Exposition at Oklahoma City early in the summer. There, this re-created oil boom town was a featured exhibit.



The Semi-Centennial Exposition held at the state fair grounds at Oklahoma City, June 14 to July 7, constituted the official state observance. A standout among the exhibits there was a re-created early oil boom town, dominated by rough-hewn antique derricks and rigs.

As the 50th-year events pass their midpoint, September brings up a series of county fairs. There will be at least 20 of these, topped off by the big state fair at Oklahoma City, September 21-28, and the Tulsa state fair, designated "Oklahoma's Golden Anniversary Exposition," September 28-October 4. The latter will include three national beef shows, the National Hereford Show, the National Angus Show, and the All-American Polled Hereford Show, as well as the National Junior Tractor Operator contest.

The Cherokee Strip celebration at Ponca City, fishing boat races at Fort Gibson Lake, world's championship outboard motor races at Oklahoma City, the Cherokee Strip pageant at Enid, Muskogee's free state fair, Pioneer Day at Cleveland, the Oklahoma Consistory at Guthrie—these will also take place in September.

The nationally-known Prison Rodeo at McAlester on September 5-8 promises to attract spectators from all over the United States. Street carnivals, water regattas, food parades, the Jean Pierre

Choteau pageant, pony express races at Salina, Little Juarez Day at Cherokee, Oil Industry Appreciation Week at Healdton (September 14-19), Tulsa's Indian pow-wow, Norman's Home Show, the Governor's Interstate Indian Council at Oklahoma City, meetings of the National Council of American Indians at Claremore and the annual Halloween Inc. parade and carnival at Pawhusk will be among festivities early this fall.

During October and November, Tulsa's Phoenix Art Center will feature works of "Pioneer Painters of Oklahoma."

Will Rogers' Birthday

November will find Claremore celebrating Will Rogers' birthday and Oklahoma City enjoying the Shrine circus. Guided tours through the Kiamichi and Ouchita national forests will feature skyliners drives to fire towers on November weekends. Authentically laid out "Indian City," near Anadarko will be open every day during the month of November from sunrise to sunset.

The windup—when Oklahoma's Big Red football team meets Notre Dame at Norman—will be on November 16, Statehood Day.

Proud Oklahoma has become one of the nation's focal areas of economic progress. It is the fourth ranking oil state, with production last year averaging



Statue of Will Rogers at Claremore will be focal point of cowboy-philosopher's birthday observance.



Indian ceremonies, reminiscent of the days before the Territory was opened to settlers, are popular attractions.

ing more than 587,000 barrels daily. With new diversification of industry, manufacturing employment has reached 91,000. This means a gain of 86 percent since 1940. Last year better than \$373,-000,000 worth of construction was going forward.

Meanwhile, cattle-raising continues to flourish. Grains and cotton richly blanket vast areas on soil much improved since the days of the Dust Bowl.

Natural wealth in gypsum and other building materials, plus deposits of coal, lead, zinc and salt also abound in Oklahoma. They will do their part in attracting capital and stoking business activity for decades to come.

A Dream Come True

When President Theodore Roosevelt signed legislation that brought Oklahoma into being 50 years ago he made real the dream of perhaps the last significant group of pioneers to stake out new lands in the nation. It had not been until 18 years before that the first part of Oklahoma had been thrown open to white settlement.

Previously most of the territory was the reserved

The colorful cowboy and his ranching activities which are so much a part of Oklahoma's glamorous history are included in the many Semi-Centennial rodeos.



domain of "the five civilized tribes," the Creeks, Cherokees, Choctaws, Chickasaws and Seminoles, along with transplanted members of the Pawnees, Comanches, Arapahoes and other tribes from the North and West. A presidential proclamation opened one area to settlement as of April 22, 1889.

One of the most pell-mell land-rushes in U. S. history took place that day as an estimated 50,000 people raced for homesteads. By the next day most of the 160-acre plots which had been marked off in what is now the Oklahoma City-Guthrie area had been claimed.

As fast as these settlers clattered in by buggies and wagons, however, they found some of the lush-est homesteads already seized by occupants who had set out sooner than authorized. These were the original "Sooners," the nickname which all Oklahomans share today.

Oil in State's History

Throughout much of the turbulent history of the state, oil flows. Shortly after the Spindletop find in Texas in 1901, Oklahoma burst into oil prominence too, when the Red Fork oil field came in near Tulsa.

In 1905 Tulsa took unchallenged rank as oil capital of the world with discovery of the Glenn Pool field. A few years later the Healdton and Cushing strikes added to the furious activity of the indus-

try and pulled in thousands more fortune seekers from other parts of the country.

The 1920's were literally roaring in Oklahoma with discovery of the great Seminole and Oklahoma City oil fields. Both of these gave rise to wild gush-ers which sprayed the countryside for miles. The latter field is still a top-ranking one, with 700 mil-lion barrels produced to date.

Last year's output of crude oil in Oklahoma added up to more than 215 million barrels. Employ-ees of oil and gas producing companies earned about \$300 million. As a group they ran second in total wage returns only to workers in manufactur-ing as a whole.

Significant too is that in 1956 the oil and gas industry paid a gross production tax of \$31 million to the state. Most of this went into roads and schools. Additional millions came from the indus-try's franchise taxes, property taxes, use taxes and retail gasoline taxes.

Oil's prominence in Oklahoma's industrial activ-ity is expected to continue, in production as well as refining. Successful wildcat completions currently run at 17 percent. The state is third in this category behind Louisiana and New Mexico. Interest in sec-ondary recovery from wells is quickening; more than 20 percent of Oklahoma's crude production now derives from this source and the proportion is expected to rise.

Recreational Sites Abound

As fruits of its progress, Oklahoma has set up a first-rate educational system, excellent highways, highly-rated enterprises in music and the theater, and an extensive array of state parks and other rec-reational sites. These areas beckon both the state's own citizens and all comers from out of state at-tracted by the current series of Semi-Centennial celebrations.

The 14 state parks dispersed throughout the state provide air-conditioned lodges, well-kept individual cottages and a round of boating, swimming, fishing, camping and other facilities. The lakes at which many of the parks are situated are man-made.

In the midst of Semi-Centennial celebrations, Oklahoma wants it known that she attributes her progress mainly to her pioneers—cattlemen, farm-ers, oilmen—who had the vision and energy to en-dure a long struggle. Their driving spirit carries over into the dynamism of the state today.



Oil's part in the state's growth is typified by this view of derricks on the capitol grounds at Oklahoma City.

Investment in Education

Once again Ethyl grants help students continue their studies

WITH THE DOORS of the country's colleges and universities opening for the 1957-1958 academic year, 24 students at as many leading institutions are furthering their education through financial assistance from Ethyl Corporation. Nineteen are recipients of graduate fellowships and the other five hold undergraduate scholarships.

The fellowships help make it possible for graduate students to continue advanced studies, while the scholarships encourage undergraduates to pursue careers in technical fields. In both cases, Ethyl's contributions are helpful to combat the national shortage of scientists and engineers.

This is the twenty-first consecutive year for which Ethyl has provided graduate research fellowships and the second in which the Company has offered undergraduate scholarships. The current awards have a total value of \$50,000.

Encourage Advanced Study

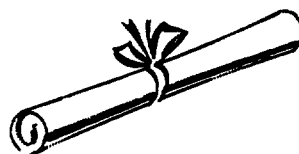
In common with similar programs sponsored by other companies, the purpose of the Ethyl fellowships is to encourage graduate students to continue their professional training through advanced levels. This enables them to be better prepared for responsible positions in industry and education. Eighteen of the fellowships are in the fields of chemistry, chemical engineering and mechanical engineering. One is in science teaching.

The Ethyl graduate fellowships for the current academic year have been awarded to the following: Columbia University (Teachers College) — Herbert Stewart; Cornell University — Robert H. Edgerton, mechanical engineering; University of Delaware — Horace H. Michels, chemical en-

gineering; University of Detroit — Robert E. Mesmer, chemistry; Florida State University — Wilmer A. Rhode, chemistry; Georgia Institute of Technology — Bradley S. Kirk, chemical engineering; University of Illinois — Gerald R. Bakker, chemistry; State University of Iowa — Townley P. Culbertson, chemistry; University of Kansas — Donald P. Sobocinski, chemical engineering.

Also, Louisiana State University — James F. Tooke, chemical engineering; Massachusetts Institute of Technology — Frank W. Dobbs, chemistry; University of Minnesota — Bruce C. Lindahl, mechanical engineering; North Carolina State College — William B. Barlage, Jr., chemical engineering; Ohio State University — Robert C. Stoufer, chemistry; University of Oklahoma — Louis F. Bolzan, chemical engineering; Purdue University — Albert J. Ignatowski, chemistry; Tulane University — Herbert Behrend III, chemical engineering; Wayne State University — Louis A. Papazian, chemistry; and the University of Wisconsin — Myran C. Sauer, Jr., chemistry.

Ethyl undergraduate scholarships have been granted to the following: University of Florida — Wilfred K. Smith, chemical engineering; Illinois Institute of Technology — Avrum S. Herman, mechanical engineering; Oklahoma State University — Aubrey R. McLain, chemical engineering; Rice Institute — Fred I. Stalkup, Jr., chemical engineering; and the University of Texas — James E. Davis, chemical engineering. #



Nature's Rock

New instruments are helping scientists solve the baffling earthquake mystery

By Jack B. Kemmerer

"THE BEST INSURANCE against one big earthquake is many small ones."

Dr. Charles Richter, world-renown seismologist, who works closely with Dr. Beno Gutenberg, director of the Seismological Laboratory at California Institute of Technology, made this statement in an interview last winter.

"A series of small quakes can relieve earth tensions and prevent them from building up to trigger major shocks," Dr. Richter explained.

A few weeks after the interview, on March 22, an earthquake hit the San Francisco area and demolished millions of dollars worth of property, but there was no loss of life. The damage, while extremely widespread, was considered minor by the experts.

While the quake was the largest to hit San Francisco since the 1906 disaster, it is thought by many scientists to have been a blessing in disguise.

This closely follows Dr. Richter's belief that small shocks act as safety valves along the San Andre Fault, a gigantic rift or crack cleaving the earth under the Golden Gate city.

Father John S. Weber, of the University of San Clara, says that the March shock in San Francisco has brought the fault line back into balance, probably eliminating a major earthquake later on. Temblors in Mexico this summer have been severe because the more a fault gets out of balance, the greater the shock when it realigns itself.

Being able to predict *where* and *when* an earthquake will occur has long been the goal of every seismologist.

This year's San Francisco earthquake was predicted in November of 1955, when a group of scientists said that the area was due for a major seismic disturbance in the near future. Their prediction was based in part on the length of time

Below, San Francisco after the big earthquake and fire of 1906 . . . Right, instruments like this earth strain gauge will help pinpoint future shocks.



ETC 30673

Roll



since a heavy shake had occurred along that part of the San Andreas Fault.

"One-half of the earthquake puzzle already has been solved," says Dr. J. P. Buwalda, structural geologist and earthquake specialist at The California Institute of Technology. "We know now pretty well *where* they will occur and are making progress toward finding out *when*. I wouldn't be surprised if we reached our goal within the next 25 years."

Part of the seismologists' optimism stems from the availability of several new instruments. It is hoped that these will provide greater information about earth disturbances, including the knowledge that will make it possible to predict *when* they will occur.

Two of the most important of these new instruments are the tiltmeter and the earth-strain gauge.

The tiltmeter is able to sense microscopic changes in the level of the earth's substrata that might herald a major disturbance. It is the scientist's equivalent of the tilt light on a pinball machine.

While the tiltmeter measures vertical displacement of the earth's crust, the strain gauge measures horizontal changes. By keeping a log of the strains recorded by several gauges over many years and noting the patterns of strain that occur just before a particular earthquake, scientists hope to be able to predict not only when and where quakes may be expected but also their intensity.

Quakes Follow Fault Lines

Although the exact cause of earthquakes has always been one of the world's biggest mysteries, scientific study has revealed one important fact. Most quakes appear to be due to fractures of the earth's crust. Huge strains develop under the surface—usually ten or more miles deep—and eventually something must give. Since the fractures, or fault lines as they are called, are weaker than the solid crust, quakes usually occur along them.

This "taking-in-at-the-seams" of the earth's surface can produce a half-dozen different kinds of pushes and shakes. Of these the ground wave along the surface is the most destructive. A movement of three-quarters of an inch can destroy a city.

When slippages occur, gigantic convulsive waves are started. They go clear through and around the



Damage from the quake that rocked San Francisco last March included scrambled groceries on the floor of this supermarket.

earth, sometimes completing the circuit two or three times. The size and extent of the shock waves are beyond human comprehension. One report of this year's San Francisco earthquake said the release of energy there was equivalent to that of thousands of atomic bombs.

Much of the world's earthquake study is centered in California, and for a good reason—the San Andreas Fault. This extensive seam in the earth's surface has been well charted for almost 700 miles in California alone. Many seismologists believe it continues north and south for several times this length—possibly for 3,000 miles. The fault goes down in a definite cleavage as if a giant with a meat axe had chopped through the earth's surface.

San Andreas has been the major cause of most of California's biggest earthquakes, including the San Francisco quake this year and the great disaster of 1906. The giant rift has cost more than 1,000 lives and caused damage exceeding \$2 billion. It remains a constant threat to the 9 million people who live within the range of its potential power.

In an effort to protect life and property in areas

such as that covered by the San Andreas Fault, residential, commercial and industrial construction is carefully regulated by city, county and state building codes. Requirements deal principally with stresses that structures might be required to withstand in a quake.

Extensive research in this direction began shortly after the earthquake at Santa Barbara, Calif., in 1926. Every major shock since that time has contributed to the knowledge and has resulted in additional changes in building codes.

Resisting Quakes

Today, the earthquake threat to building construction is quite well understood. Information gained from the study of some 88 seismic disturbances makes it possible for engineers and architects to design structures to resist the effects of even heavy quakes. California oil refineries, tank farms and pipelines, for example, are designed and built to withstand such tremors.

In the past, the greatest losses have been traced to the use of weak and brittle building materials, with little or no ductility or toughness. Steel has supplied the solution in most cases, and today unreinforced materials are seldom used in seismic areas.

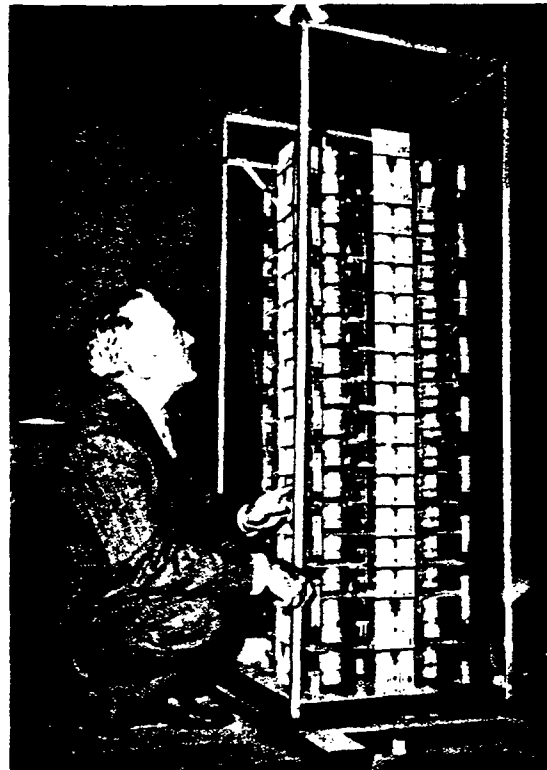
In spite of buildings that will withstand even major earthquakes, there is always the danger of loss of life. Why, then, do 9 million people continue to live in an area that is constantly susceptible to earthquakes? One reason, geologists say, is that no place on earth is safe from earthquakes.

Every state in the United States has been hit at one time or another. Dating back to 1663, great disturbances have rumbled through Massachusetts, northern New York, Oregon, Montana, Missouri, Texas and South Carolina—to name just a few.

According to seismographic records, 253 tremors, large enough to be recorded and located, hit 23 different states in 1953 alone. In March of that year, 31 quakes shook such widely separated cities as Stamford, Conn.; Brandon, Vt.; Concho, Okla.; and Helena, Mont.

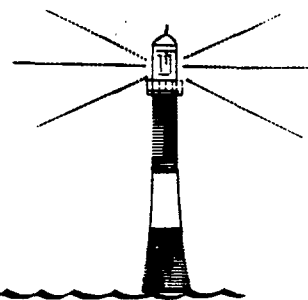
And so the seismologists continue their studies. With each new earthquake they add new knowledge and get closer to a solution of one of nature's greatest mysteries:

When will the next earthquake take place and how strong will it be?#



How to build structures having maximum ability to resist earth tremors is being studied with this carefully instrumented scale model.

SPREADING NAUTICAL KNOW-HOW



The United States Power Squadrons promote more competent boat handling

By Stanton P. Nickerson

IN THE PALE LIGHT of an early summer morning, a trim cabin cruiser casts off from her mooring and heads for open water. As she approaches the harbor breakwater, other boats join her—dim silhouettes against the sky.

More craft soon appear from neighboring anchorages and take their places in the nautical caravan. By sunrise, over 50 pleasure craft are heading east along the coast as their skippers check their courses by chart and compass and apply their knowledge of simple navigation.

The boats range from ketches and yawls under auxiliary power to launches with outboard motors,

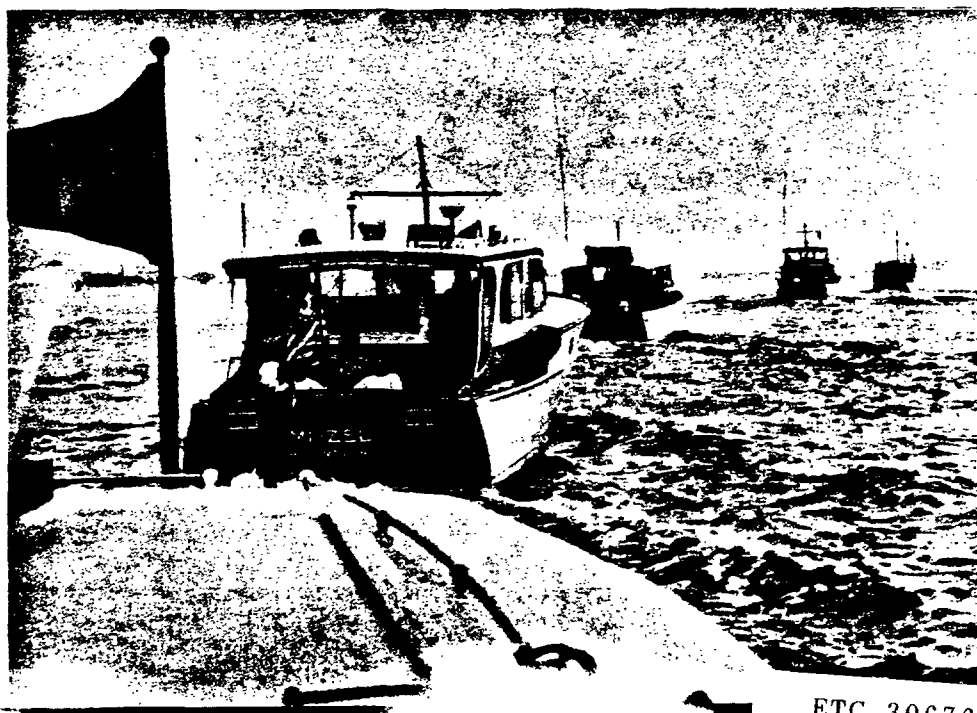
but each flies a similar flag—one with blue and white vertical stripes and an anchor circled by stars in a red field.

Those at the wheels or tillers of boats in this oddly assorted armada belong to a local unit of the United States Power Squadrons, a national non-profit organization of almost 40,000 men dedicated to the advancement and enjoyment of life afloat. This is the largest association of boating enthusiasts in the world. More than 10,000 new members have joined since 1950, almost doubling its previous size.

Most of the 225 local units of the boating organization arrange at least one major outing or "rendez-



Cabin cruisers on their way to compete in proficiency contests at a Power Squadron's rendezvous on lower Chesapeake Bay.



ETC 30676

vous" during the height of the outdoor season. This brings squadron members together at a yacht club, marine center or waterfront park equipped to accommodate visiting fleets of from 10 to 250 boats.

Brief ceremonies usually are held to open the rendezvous. But after this initial formality, all those taking part are far more interested in pitting their skills against each other in nautical contests, and joining in social events and recreational activities. The program may last a day, two or three, or include a supplementary cruise on the way home.

Navigators' Contest

Because a rendezvous is the high point of any local Power Squadron's yearly agenda, it is planned to have a memorable and constructive impact. One of the most challenging events frequently scheduled is a navigators' contest. The winner is the boat covering a given course in an elapsed time which is closest to the skipper's advance estimate.

This means that the sleekest schooner under auxiliary power often competes with an inboard-engine cruiser or a tender having only a small outboard motor. The contest shows how well the skipper knows his boat's operating characteristics; his ability to allow for winds, currents and other fac-

tors; and how successfully he can plot his individually assigned course and follow it by compass. In many a navigators' contest, the victor has crossed the finish line within split seconds of the time predicted.

There is also plenty of rivalry on more elementary levels. Knot-tying, splicing, rope-casting and reefing contests are popular. Seeing who can beat the compass the fastest, while a judge holds a stop watch, is fun and good practice too. Dinghy races teach power squadron members more about skill in small boat handling.

Although membership in the United States Power Squadrons is restricted to men at least 18 years of age who are American citizens, entire families and their friends join in diversified rendezvous events like potato-sack races, children's contests, men versus women baseball games, clambakes or barbecues and dances at night.

Teaching and Learning

Unlike many people whose favorite recreation is limited to only a part of the year, Power Squadron men are busier than ever when the rendezvous season is over. They spend their months ashore teaching others and learning how to become s-

Below, firing the starting gun for a navigators' contest at a typical rendezvous . . . Right, a class in engine maintenance is taught by an experienced volunteer from a local Power Squadron . . . Far right, a realistic star pattern is projected on a parachute during a course in celestial navigation.



ETC 30677

more competent themselves. This is true whether members are boat owners or not.

Their interest and efforts are in keeping with the national organization's objectives: to promote high standards of handling and navigational skill, so that life afloat will be better, safer and more enjoyable for everybody.

A broad educational program to meet these goals is carried out by local squadrons in the organization's 25 districts from coast to coast and in Alaska, Japan, Hawaii and the Canal Zone. Experienced volunteers teach their subjects so well that they have won commendation from the United States Naval Academy.

Throughout the United States Power Squadrons' 43-year existence, almost half a million Americans have attended its free piloting course. Annual enrollment now is close to 40,000. The course is a general one in small boat handling, and covers seamanship, equipment, safety, shipboard manners and customs, rules of the road and similar fundamentals. Successful completion of the course is a prerequisite to Power Squadron membership.

Advanced elective courses varying in length from eight to 14 weeks also are offered. These sessions—open to qualified women as well as male mem-

bers—include seamanship, advanced piloting, junior navigation, navigation, engine maintenance, weather, sailing and related nautical subjects.

Classes are informal, with plenty of question-and-answer periods. Outside study is required, and "students" must pass tests and final examinations to qualify for successful-completion certificates.

Energetic salt or fresh water sailors can continue these free studies for several years. Eventually anyone who completes the celestial navigation course can put a coveted "N" after his name, like the national organization's chief commander, William C. Wolfmuller of New York.

Since their organization has become the world's largest boating association, veterans of the Power Squadrons enjoy looking back to 1912 to see how far they have come. It was in that year that a Boston Yacht Club group started local efforts to improve motorboat handling.

Its accomplishments won such attention and endorsement that they paved the way for founding the United States Power Squadrons in New York in 1914. Since then the national organization has been concentrating on educational activities continuously and with increasing effectiveness.

The expansion and progress of the organization is closely related to the doubling and redoubling of public interest in all kinds of boating. Power Squadrons must be allotted a major share of credit for the growth of the nation's power boat population to nearly six million inboard and outboard types today.

Low Dues

Close to 10,000 Squadron men own motorboats of some kind, but just as many are windjammer enthusiasts. Half of the organization's members have no boats at all, but after taking part in rendezvous, educational and other activities, most of them are competent helmsmen.

As for the future, the United States Power Squadrons expect the present membership will double within a few years. Determined to maintain its democratic traditions, it keeps annual dues and the initiation fee moderate.

A well-known yachting editor describes the Power Squadrons as "the most enthusiastic" organization concerned with boating. For this reason alone, to say nothing of past accomplishments, its potential contributions to the further expansion and improvement of recreation afloat seem assured.#



BEFORE a new skyscraper can lift its multistory bulk against the sky, scores of oil-powered machines must perform a variety of essential and often spectacular roles in preparing the site and foundations upon which the building will rise.

These pictures show typical early stages in the construction of a new head office building for the Chase Manhattan Bank, New York. In "the largest hole ever dug in the city," an orderly bedlam of mechanized equipment is shoveling, lifting, scooping, hammering, hauling, pumping and mixing 24 hours a day.

All of this work is being done without disrupt-

ing adjoining subways, utility lines or other underground arteries of the metropolis' busy financial district. Thousands of fascinated sidewalk superintendents keep track of progress.

The new 60-story monolith will soar 800 feet above an ornamental plaza and fountain. Close to 15,000 people will work in air-conditioned comfort throughout the building's two and a quarter million square feet of floor space.

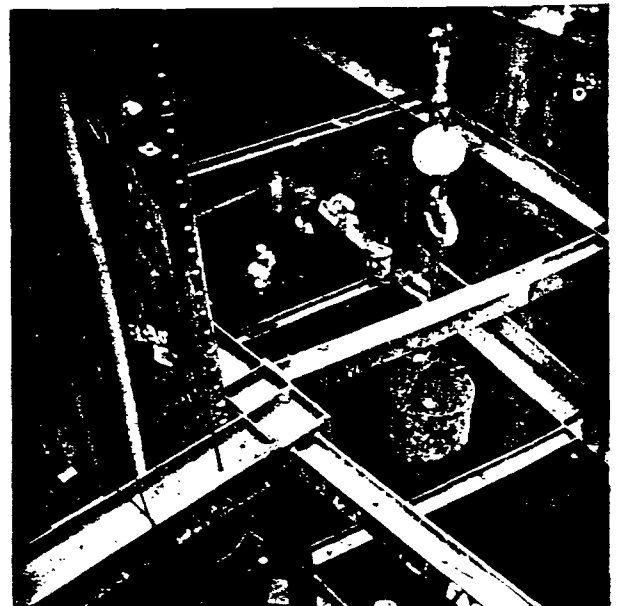
When the steel and glass tower is occupied by 1960, it will represent the achievements of many skills and industries, with oilmen and their products sharing in its creation. #

Banking on Oil



Diesel-powered pumps supply compressed air for "concrete busters" used in excavating remnants of buildings formerly on the new skyscraper site.

Earth shoveled by men working in this shored foundation pit is hoisted to the surface in buckets by an oil-fueled crane.



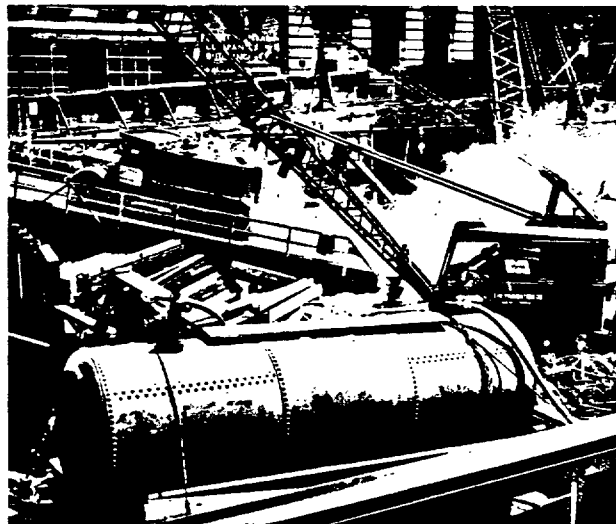


◀ This scale model shows how the new Chase Manhattan Bank tower, when completed, will soar above most neighboring skyscrapers.



Clamshells bite and spill in rhythmic time as they dig a basement, four lower levels and trenches for foundations on bed rock.

With exhaust roaring, this front-end loader fills its maw with soil and rock to be hauled away.

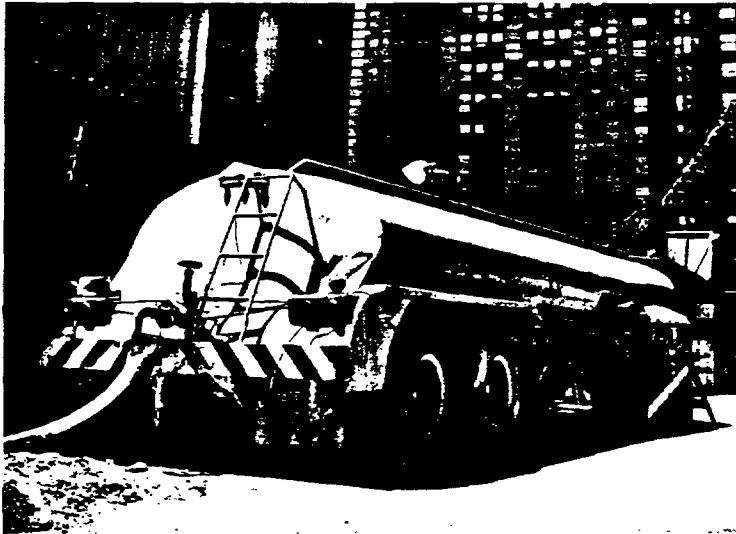
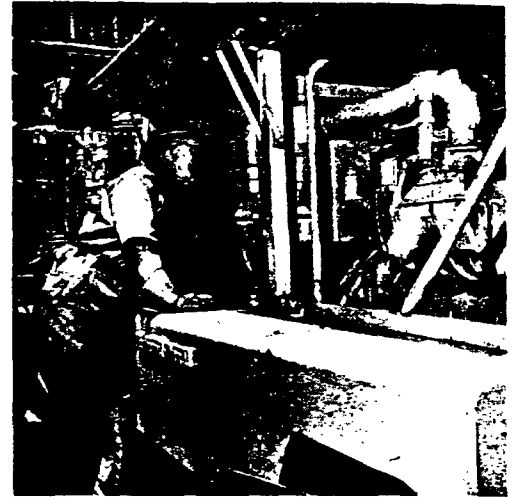


A ramp to the street accommodates caravans of heavy vehicles. This truckload of excavated material will be dumped at sea from a barge.

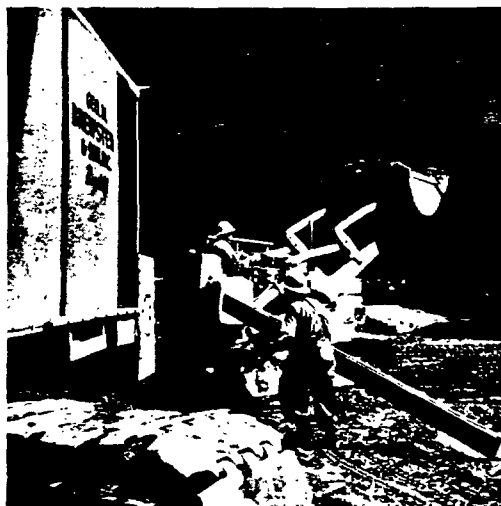


Gasoline engines in portable units generate some electricity used in welding. This hooded workman is repairing a damaged steel hopper.

Various construction tools require a steady stream of compressed air from a battery of units like this one.



Slushy subsoil found deep underground is given load-bearing strength and solidity by special chemicals pumped from this tank truck.



When mixed concrete is needed to start pouring foundations, a procession of trucks brings it.

Repetition is characteristic of the entire job. As soon as a loader removes one pile of earth, it bites into a new one to fill another truck.

Future Fuels, Engines Pictured in New Film

A RESEARCH REPORT on tomorrow's high compression engines and their fuels is available in a new motion picture, "Matching Future Engines and Fuels," now being offered as a service by Ethyl Corporation.

This unique presentation describes the nature and scope of Ethyl research into "the relationship between fuels and engines of the future, and how the composition of future fuels will affect engine performance." The film also explores "what design modifications can be made in engines that will lower fuel anti-knock requirements."

Studies which the motion picture show are conducted at the Company's Research Laboratories in Detroit. They include work on three engines with different combustion chamber designs, each of which has a compression ratio of 11 to 1.

Although the film does not attempt to reach inflexible conclusions about future designs for such engines or determine all specifications for the gasoline they will need, it reflects Ethyl's contributions in a field with which the oil and automotive industries are increasingly concerned.

Planned especially for executives and technical personnel in these industries, "Matching Future Engines and Fuels" can be seen by arrangements through Ethyl representatives. It is a color and sound film with a running time of 12 minutes. #

New Plant Taking Shape



WORK IS PROGRESSING rapidly on the new anti-knock compound plant which Ethyl Corporation is building at Pittsburg, Cal., in the San Francisco Bay area. At the present rate of construction, the manufacturing center will begin supplying the needs of west coast refiners by mid-1958.

Since ground was broken six months ago, extensive site preparation has been carried out, including hydraulic filling and pile driving. Now modern structures are being completed or are taking shape on the waterfront tract. These include a central process building for antiknock compound production, shops and stores, an administrative headquarters, a steam generating plant and storage facilities.

"Many projects have been finished," according to A. Clarke Burdick, Jr., Ethyl's chief engineer. "Among them are the shops and stores building and the foundations and steelwork for other major units. Most of the underground piping and foundations for equipment also are completed." #

John S. Wintringham Appointed Senior Research Advisor

JOHN S. WINTRINGHAM has been appointed senior research advisor at Ethyl's Research Laboratories in Detroit. He is responsible for technical coordination and liaison with the petroleum industry, will carry out special studies for oil companies and serve as an advisor on the Laboratories' over-all research program.

Mr. Wintringham assumes many of the former responsibilities of J. B. Macauley, who has resigned to serve as Deputy Assistant Secretary of Defense for Research and Engineering in Washington.

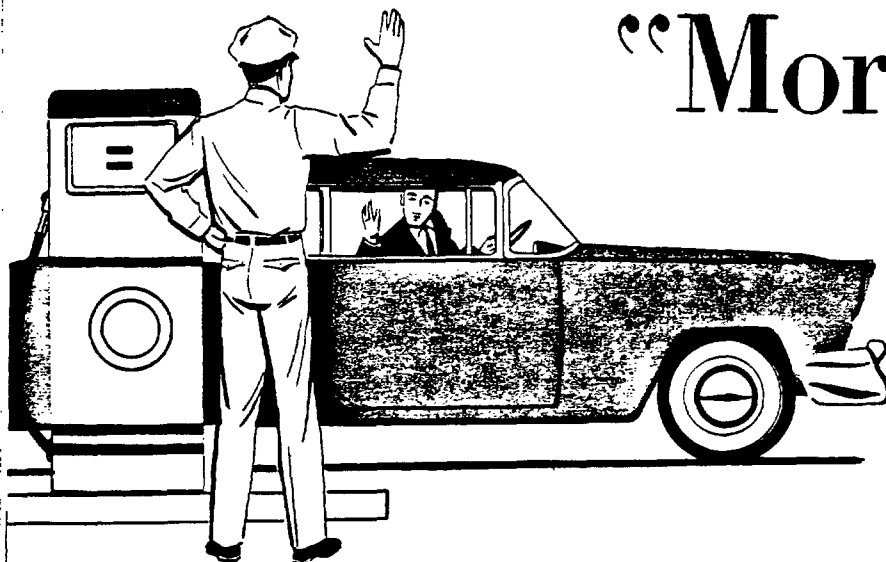
Mr. Wintringham joined Ethyl in 1930, following graduation from Harvard University. He has held many key supervisory and engineering positions in the Company's research organization. #

Robert Herzog Named to Head Economic Research Staff

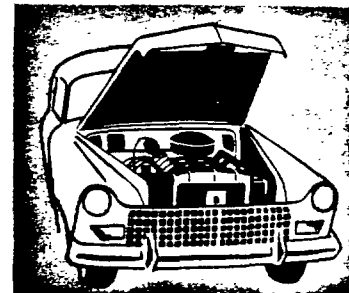
ROBERT HERZOG has been named to head the Economic Research staff recently formed at Ethyl Corporation. The group, which has been established to coordinate preparation of major economic studies and analyses undertaken by the Company, will have its headquarters in New York.

Mr. Herzog has been associated with Ethyl for the last 17 years. He holds a B.S. degree in chemical engineering from Cooper Institute of Technology and an M.S. degree in chemistry from the University of Michigan.

Prior to his new appointment he was staff assistant to Dr. George F. Kirby, Ethyl vice president in charge of Research and Development. #



"More Mileage



New booklet tells how to achieve better fuel economy and discusses progress in gasoline quality

TO SERVICE STATION PERSONNEL, a typical motorist's lament that "my car just doesn't seem to be getting the mileage it should" is a familiar one. All too often the complaint is coupled with a false indictment of gasoline as the reason why.

Truth of the matter is, of course, that fuel economy involves a combination of factors. Mileage depends upon:

1. *Modern gasoline*—which meets accepted standards of quality . . .
2. *Car design*—the type of engine, transmission, powered accessories . . .
3. *Maintenance*—tune-up, lubrication, cooling system, tires . . .
4. *Driving*—how, where and what operating conditions.

To impress upon the public these as well as other related facts about gasoline and gasoline quality, the American Petroleum Institute has prepared, with the assistance and cooperation of Ethyl Corporation, a new 16-page booklet, "More Mileage to You."

The booklet is designed to give the facts about automobile mileage to the motorist and to serve as a training aid for gasoline dealers, salesmen and fleet operators. It will be distributed initially during Oil Progress Week, October 13-19. Since the booklet is a public service publication, single copies will be distributed free by the API. Bulk quantities will be sold at a nominal fee.

It is expected that "More Mileage to You" will prompt more motorists to stop at service stations for car maintenance and repair jobs which they have been overlooking or neglecting.

Chemical Miracle

"Modern gasoline is a miracle of petroleum chemistry," the booklet explains. "Except for its appearance and price, it is vastly different from a gasoline of 1930, for example. In modern cars designed to utilize it, today's gasoline will develop at least 60 percent more economy or 30 percent more power than could 1930 gasoline in 1930 engines.

"Thanks to unceasing technological progress and healthy competition for your patronage, the price

to You"

of gasoline today, in terms of the work it can do for you, is less than it was in 1930, even though gasoline taxes have risen about 130 percent and the average cost of everything else you buy has risen more than 65 percent."

The booklet then explains, in non-technical words and illustrations, just how design, car care and driving influence the mileage each motorist realizes from his automobile.

In the case of design, it is pointed out that the old Model T Ford may have run 20 to 30 miles per gallon, but the power, speed and acceleration of the modern car were missing.

Because actual miles per gallon usually decrease with added car weight, the true yardstick for measuring mileage is ton-miles per gallon. This is the distance that a gallon of gasoline will move one ton of automobile, regardless of its size. On this basis, the average modern car realizes a healthy 45 ton-miles per gallon (at a speed of 40 miles per hour) compared to only 28 ton-miles or so for vehicles of a quarter century ago.

The car care section of the booklet describes a dozen items that affect mileage. The motorist is reminded, for instance, that tires underinflated by five pounds can waste one of every 40 gallons of gasoline and perhaps more. One gallon in every ten that the car owner buys can be "lost" because of faulty spark plugs. A dirty air filter can cut mileage by 10 percent and a slow-acting or stuck choke by up to 30 percent.

Finally, the role that driving conditions and individual "behind the wheel" habits plays in mileage are discussed.

All of the skillful attention that the service station operator gives to putting a car in tip-top opera-

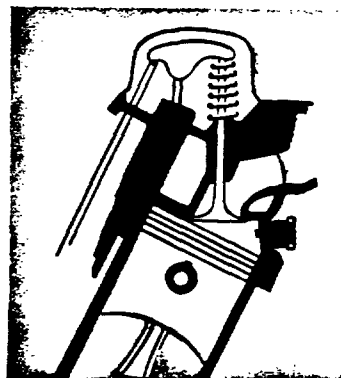
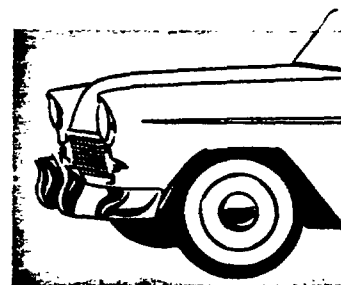
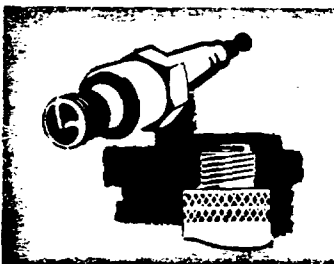
ting condition can be offset by wasteful driving habits, such as "jack rabbit starts," fast and sudden stops and letting the engine idle unnecessarily.

Motorists who complain of poor mileage also should be aware of the difference in open road driving as opposed to city driving. Many modern cars can average 20 miles per gallon on the highway at a steady 40 miles per hour speed. But these same cars rarely will show better than 14 miles per gallon if required to make, say, five stops and starts per mile of driving. Likewise, hilly or mountainous country operation requires more gasoline than flat country driving.

Provides Mileage Check Sheet

As a closing feature, the booklet provides a mileage check sheet on which motorists can readily compute their car's gasoline consumption.

Automobile owners concerned with the mileage of their car, the booklet summarizes, should ask themselves two questions: Is my car maintained to take advantage of modern gasoline? Do I avoid wasteful driving habits? If the honest answer to both is "yes," the motorist can be sure that he is enjoying all of the economy offered by the combination of modern engines and modern gasoline. #



Among the items affecting mileage, the booklet points out, are spark plugs, tire inflation, lubricant viscosity and engine compression.



One Man's F

The five Powers make the hospitality and service at Airhaven something special

By Henry F. Unger

A LONGSIDE MOST HOMEOWNERS' short driveways, the 3,200-foot approach to the Powers' family headquarters is gigantic. But then, the Powers' approach is a runway. Their home is an airport!

Twelve miles west of Phoenix, Ariz., the Powers quintet—father, mother, two sons and grandfather—operate Airhaven Airport, Inc., a commercial flying field that's permanent home to some 75 small planes and week-end base for several dozen more.

The Powers talk aviation as easily as most families discuss the weather. Their familiarity with planes and flying comes from experience. Every member of the family pitches in to make the airport operation a success.

Jobs for Everyone

Garrett L. Powers—"Alabam" to hundreds of fliers who have enjoyed Airhaven's warm hospitality and friendly service—has a pocketful of aircraft licenses and rebuilds and inspects small planes. Elizabeth Powers, mother and homemaker, replaces wing and fuselage fabric and reupholsters plane interiors. The boys, Melvin, 15, and Carl, 11, refuel and wash planes and keep the grounds in order. Grandfather R. C. Powers is bookkeeper.

As if these conventional chores didn't keep it

Airport operations, family-style: Melvin and Carl wash down a plane while Mrs. Powers measures material for a reupholstering job.



's Family Runs an Airport

busy enough, the flying family also finds time to serve as baby sitters, hotel reservation clerks, caterers and to operate a rescue and taxi service. After ten years, the Powers have become accustomed to everything—roaring engines outside their trailer home on the airport grounds and wailing babies in the crowded office.

Airhaven Airport wasn't always a "one man's family" operation. "Alabam" Powers, so dubbed because of the Southern accent he brought to Arizona in 1944, left a large aircraft company near Phoenix and joined the airport as a stockholder and maintenance shop head in 1946. Not long afterward, the Powers family became sole operators.

Because of Alabam's flying know-how and the family's genial manner, the Powers have won the hearts of many individuals and organizations. Movie stars, business executives and everyday people land at the convenient strip both because of its proximity to Phoenix and the Powers' hospitality and service. Flying groups such as the Cowl Dusters, Luke Aero Club, Westside Flying Club and Grimshaw Air Ambulance make Airhaven their headquarters.



Nearby Sky Harbor Airport, one of the country's big bases, tips its natty flying cap to tiny Airhaven for its willingness in providing auxiliary landing space whenever needed. From the smooth dirt strip, too, air searches are launched by the flying deputy sheriffs of Maricopa County, with Alabam Powers frequently joining in.

As further evidence that the welcome mat is always out, the Powers carry out radioed requests from approaching flyers for motel reservations; provide sandwiches for hungry arrivals; telephone husbands or wives of their spouse's impending return; and arrange for ambulances to meet planes carrying sick or injured passengers.

Owens Three Planes

Flying has long been a big part of Alabam Powers' life. His first flight came in Waycross, Ga., in 1927, when as a boy he earned a ride from barnstorming pilot in return for repairing a bumpy runway. During World War II, he was an inspector of B-24's and B-29's. Today, he is a CAA-designated aircraft maintenance inspector and owner of three planes—a Piper Tri-Pacer, a Cessna Air Master and a Piper P-11 trainer.

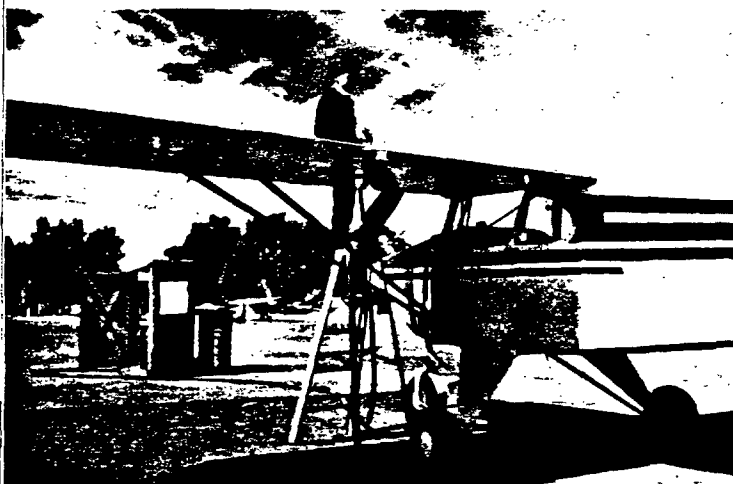
The airport keeps the Powers so busy, however, that they seldom find time to take to the air. Now and then, they get off with a flying breakfast club for a brief jaunt to Prescott, north of Phoenix. Currently, Mrs. Powers and Melvin are taking flying lessons and hope when they qualify for licenses that the family air fleet will be used more frequently.

When the boys are in school, the airport staff is cut to three—father, mother and grandfather. Still, airport maintenance and improvements go on. New facilities and methods are introduced in the engine

"Alabam" Powers, airport manager and maintenance chief, checks office details with his father who takes care of the bookkeeping.



Teaming up to provide one of Airhaven's many extra services: "Alabam" relays a radio message from an approaching pilot to Mrs. Powers who wastes no time in telephoning it to the flier's home.



Above, from atop a stepladder, Melvin prepares to refuel a plane . . . Right, by keeping a pushbroom busy, 11-year-old Carl helps maintain Airhaven's reputation for cleanliness.



assembly room, in the fabric room and in the office. Not long ago, Alabam installed an underground refueling island of his own design. Gradually he is oiling the runways and ramp for dust control.

Working at her specialty, Mrs. Powers has become so adept at replacing fabric that she has won the commendation of enthusiastic plane owners. She can cover a couple of wings in a week and regularly devises new color schemes for upholstery changes in aircraft interiors.

The income that the Powers get from airport operations is important, of course, but the satisfaction that comes from running a bustling friendly operation is also rewarding. Christmas cards from South America, Alaska, Mexico and many other countries, as well as from throughout the United States, attest to their assistance to an unending stream of appreciative air travelers.

Varied Experiences

The inward glow that comes from helping others is based on a wide range of experiences. There was the dramatic occasion when a bewildered pilot, struggling with a coughing plane called for assistance. Alabam dashed for one of his planes, took off, met the worried flier in the air, and guided him to the air strip in safety. But the Powers get a big kick, too, out of such undramatic acts as providing a first plane ride for a youngster who's enjoying it as a reward for improved performance in school.

Any pilot who has ever landed at the small Arizona airport will tell you the same thing. "It's the smiling congenial atmosphere at Airhaven that really makes you feel at home." #

DEC. 9, 1921

That Memorable Day



ABOUT THE AUTHOR

T. A. "Tab" Boyd, the author of this article, has been associated with the Research Staff of General Motors Corporation ever since the Staff was formed in 1920. He was head of its Fuel department from 1923 to 1947 and presently is a consultant.

Mr. Boyd was born in Fairview, Ohio. He received a bachelor of chemical engineering degree from The Ohio State University in 1918 and later the professional degree of chemical engineer. He holds honorary doctor of science degrees from Ohio State and Wayne State University and an honorary doctor of engineering degree from the University of Detroit.

He began his career as a research chemist in the Research division of the Dayton (Ohio) Metal Products Company in 1918. Two years later, that organization was merged with General Motors and became the nucleus of the GM Research Staff. Together with Charles F. Kettering, former general manager of the Research Staff, and the late Thomas Midgley, Jr., he was a pioneer in the study of fuel composition and combustion, particularly in the search for ways to eliminate knock.

Mr. Boyd received the Horning Memorial Award from the Society of Automotive Engineers in 1950 for his work in the field of automotive fuels and the Lamme Medal from The Ohio State University in 1939 for meritorious achievement in engineering.

**Tetraethyl lead rewards the research
group looking for the best agent
to eliminate fuel knock**

By T. A. Boyd

CHARLES F. KETTERING has said that December 9, 1921, was the most dramatic day in his entire research career. As one who took part in the day's exciting events, I consider it one of the most memorable in my life, too.

December 9, 1921, was when the antiknock properties of tetraethyl lead were discovered—the day the roadblock to automotive progress that knock had erected was battered down.

Actually it wasn't quite as simple as that. It was more than a year before gasoline containing tetraethyl lead (TEL) was ready for public sale. It was several years before "Ethyl" gasoline became a national product rather than a new grade of motor fuel available in only a few states. But from that memorable day on, success was in sight.

I must confess that we who were in on the discovery on December 9—Thomas Midgley, Jr., Carroll A. "Ted" Hochwalt (now a vice president of Monsanto Chemical Company) and I—were not surprised that TEL proved to have such effective antiknock properties.

Only six weeks before, we had established that *tetraethyl tin* is a good antiknock agent. Because lead is in the same chemical family of elements, it followed that *tetraethyl lead* certainly ought to be an excellent knock suppressor too. But we had no way of knowing how good an antiknock TEL would prove to be. As things turned out, it was far better than anything we had tried before. Today, it remains superior to any other agent yet found and is, of course, still the principal ingredient in "Ethyl" antiknock compounds.

But to tell the story in its proper chronological order . . .

The active search for a commercially successful antiknock had started in 1916 in Kettering's little laboratory in Dayton, Ohio. Soon after it was underway, Tom Midgley had determined that overcoming gasoline's natural tendency to knock was a chemical—not a mechanical—problem.

In 1917, Kettering set up a new laboratory—the Research division of the Dayton Metal Products Company, of which he was an owner. The United States was then in World War I, so the laboratory was devoted entirely to the war effort.

Engaged in Two Projects

It soon became deeply engaged in two projects. The first was to produce a more knockfree gasoline for use in the Liberty airplane engine. The second was the development of a flying robot bomb or "aerial torpedo."

When I joined the laboratory in April 1918, a few months before my graduation from Ohio State University (because of my academic standing, I was allowed to spend the final few months of my college career working for Kettering and still get my degree), I was assigned to work under Midgley on both the gasoline and flying bomb projects.

It wasn't many months before the war was over, however, and when the laboratory returned to peacetime pursuits, antiknock research was resumed.

Within a short time I was fortunate enough to discover that aniline, and nitrogen compounds similar to it, are effective antiknock agents. I say "fortunate" because not long before the aniline discov-



Above, the author and C. F. Kettering at a plaque in memory of Thomas Midgley . . . Right, the bouncing-pin indicator used to measure knock.

ery, it had been decided that because of the limited staff and the number of other projects on which the laboratory was working, the search for an antiknock agent would be pursued for only a few more weeks unless something practical was found.

During the ensuing two years, we tried to commercialize aniline, but finally had to admit that it was not practical.

Just as the decision to abandon the aniline program was reached, we discovered that compounds of selenium are much more effective knock suppressors than aniline, and that compounds of a similar element, tellurium, are more effective still. These discoveries led us to evaluate all of the elements in the light end of the Periodic Table.

Measuring Knock

To do that, we needed a better means of measuring knock and a consistent and comparable series of compounds of the elements concerned. So we spent the summer of 1921 developing what became the bouncing-pin indicator. This device, with improvements, was for the next quarter-century the standard instrument for measuring knock.

By this time, we were the General Motors Research Corporation. GM had bought out Kettering's interests with the understanding that he and they

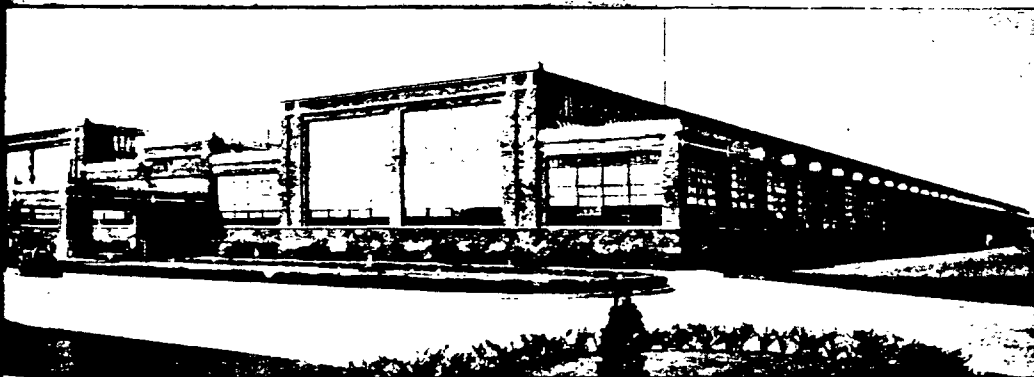
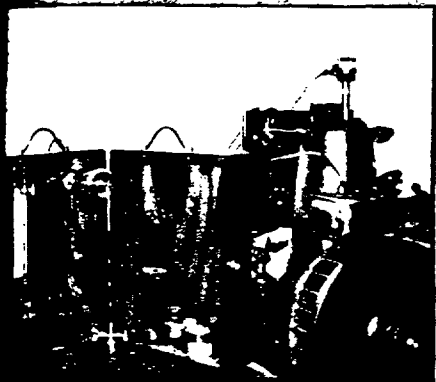


would be the nucleus of the General Motors research group. A GM laboratory was set up in a building in Moraine City on the outskirts of Dayton. It was there that the search for the antiknock was carried to its successful completion.

Aniline Yardstick

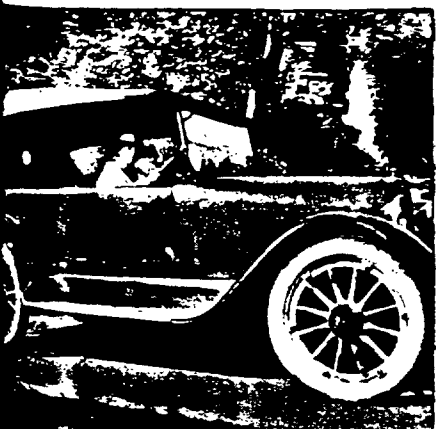
With the bouncing-pin indicator, evaluation of other compounds was undertaken in the fall of 1921. We rated the compounds by comparing how well they stopped knock compared to the way aniline did. We ran the Delco test engine, incidentally, on kerosene rather than gasoline, since it was designed for kerosene operation. It had a mixing valve instead of a carburetor. This was good for our purposes, for it was easier to regulate the amount of whatever compound we were adding to the kerosene.

After establishing in our investigation of compounds in the particular part of the Periodic Table in which we were working that tetraethyl tin was a good knock suppressor, a test of tetraethyl lead was a logical step. Since there was no such compound then in existence, Midgley and Hochwalt had to



Above, the Moraine City laboratory of General Motors, where the antiknock properties of TEL were discovered.

Left, the Chevrolet used to test experimental knock suppressors during the search for an ideal agent.



make tetraethyl lead in our laboratory. They finally succeeded in producing a small quantity—and I do mean small. It was only about five cubic centimeters, and we had no assurance, of course, that it was pure tetraethyl lead.

We set about to rate the TEL on the morning of December 9, 1921. With the little Delco engine running, I introduced some tetraethyl lead—purely by guess—into the kerosene. I suppose I added about one percent TEL by volume to the kerosene.

The engine ran beautifully; not the slightest knock. So we halved the concentration of TEL. Still the engine purred noiselessly.

This process of halving the concentration was repeated time after time, and still the engine ran without knocking. Excitement among us mounted higher and higher with each halving step. Here was an antiknock agent that was 50 times as effective as aniline!

Midgley, the leader of our group, hurried to Kettering's office to tell him of our success. As Kettering later told it, Midgley rushed into his office, stuck out his hand and said, "Shake, Boss, we've really got something now." Naturally, Ted Hochwalt and I were just as thrilled by the discovery.

I don't know what would have happened to the antiknock research program if TEL hadn't worked because we were nearing the end of our list of compounds to be tested. But the important thing was—and is—that tetraethyl lead did work. We lost no time in verifying this in larger-scale scientific tests the next day, double checking on the happy results we had obtained that December 9.

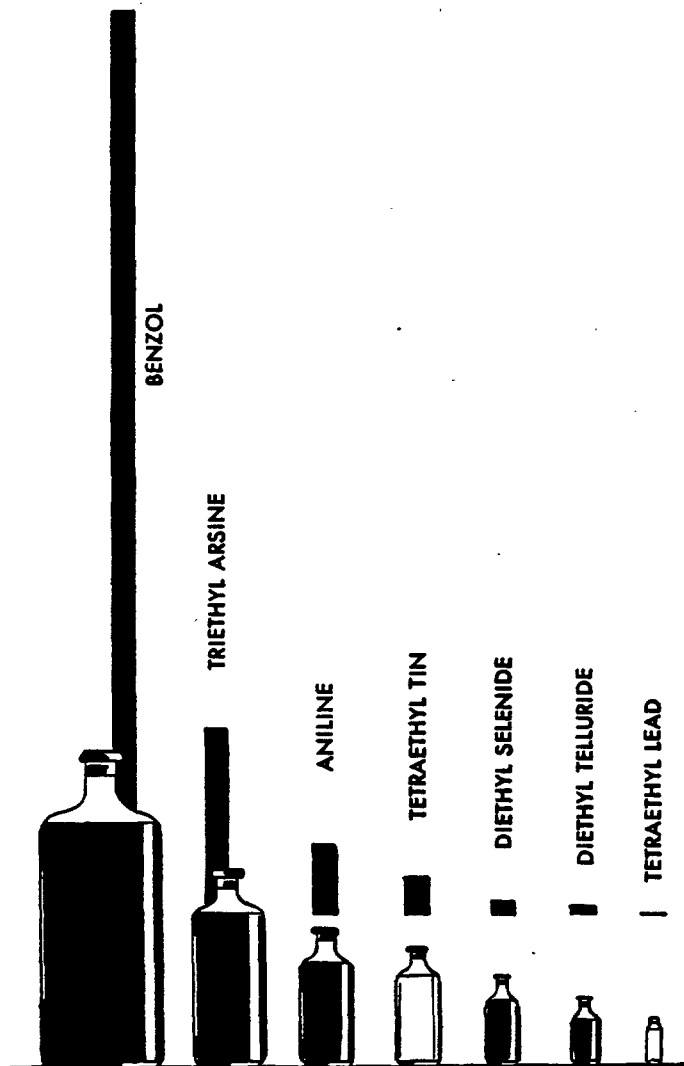
Midgley and Hochwalt spent virtually all of the year 1922 determining how tetraethyl lead could be produced economically so it could be introduced to the public. My assignment was to find a way to overcome the deposits left in an engine using gasoline containing TEL. It was to take the better part of two years to establish that bromine and chlorine compounds added to TEL would correct this problem. Today ethylene dibromide and ethylene dichloride do this job with complete effectiveness.

Midgley in Touch

Midgley was in Florida for about six weeks during the winter of 1922-23 to regain his health and strength, which had been sapped somewhat during the antiknock research. As his assistant, I was in charge of the General Motors Research Corporation's fuel department during his absence. But with "Ethyl" gasoline soon to be sold publicly for the first time—the first sale took place February 2, 1923—Midgley remained in constant contact with us by telephone, telegraph and mail.

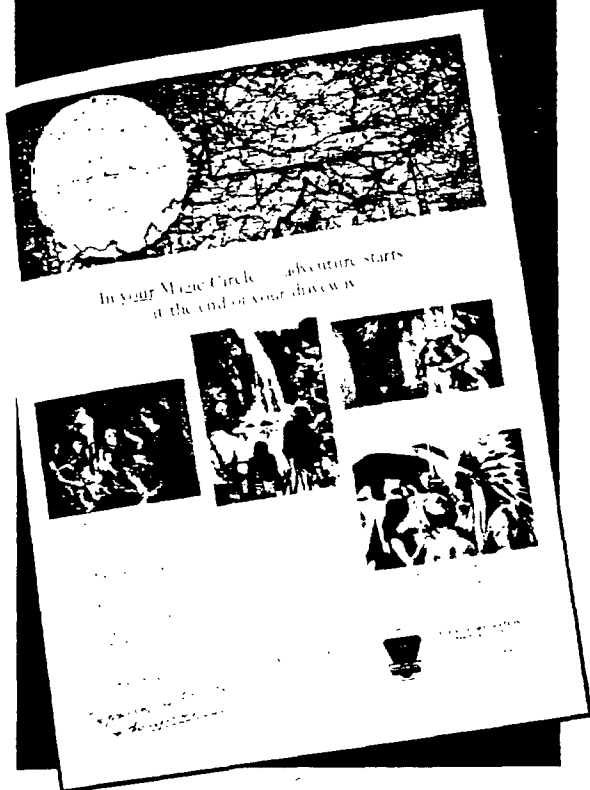
It was almost seven long, heartbreaking years from the time the antiknock research started in 1916 until gasoline improved by tetraethyl lead compound was introduced to the public. For my part, the five years I spent on the project were highly rewarding. Our disappointments and setbacks were more than offset by the knowledge that we had developed a product that contributed—and continues to contribute—to human progress. #

This chart shows the relative amounts of various additives required to make gasoline equally knock-resistant. With the effectiveness of tetraethyl tin as a clue, further tests with organo-metallic compounds proved the superiority of TEL.



Printed in U. S. A.

ETC 30691



CHARTING THE MAGIC CIRCLE

THE NEW, full-color advertisement that appears on the back cover of this issue of ETHYL NEWS is experimental. It was prepared recently for possible use in Ethyl Corporation's continuing market-expansion program. Like other market-expansion advertisements which Ethyl has published as a service to the oil industry over the last three years, this ad is designed to persuade motorists to use their cars more for driving pleasure. Increased car use, of course, benefits oil companies and their dealers by increasing sales of gasoline, oil, and all automotive products and services.

This ad helps establish the new market-expansion program's "Magic Circle" theme. The Magic Circle is the limitless area around any motorist where he and his family can find enjoyment and adventure by automobile.

Since this particular advertisement is experimental, it may never appear in leading national magazines for which it was proposed. Still, it has great value. First, it enables the people concerned with Ethyl advertising to see a finished ad of the type being proposed, and second, it provides a sample for test purposes.

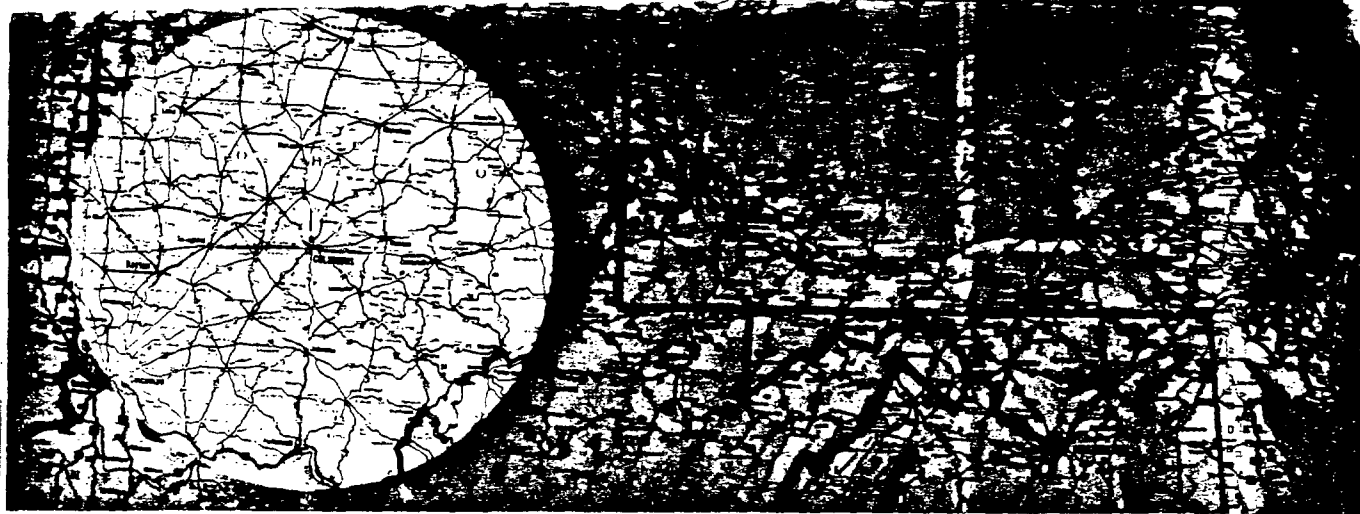
To test its effectiveness, this new Ethyl

market-expansion advertisement is being circulated along with other ads among sample groups of representative magazine readers. After reading the ads, these groups will be queried to determine which are best remembered, how much of their messages are retained, and what impressions they make.

The ad had its beginning early this spring when Ethyl started planning market-expansion advertising for 1958. First step, of course, was to establish the objectives of the program. Then came studies to determine the best types of advertising to accomplish these objectives.

After literally dozens of rough suggestions had been considered, the Magic Circle theme emerged as the most promising. Accordingly, this Magic Circle ad was prepared.

The results of tests and studies of this experimental advertisement will guide Ethyl advertising people in the preparation of the new series of Magic Circle market-expansion ads for the oil industry. If you have any thoughts or suggestions regarding it, Ethyl's Advertising department would appreciate hearing from you. You are invited to write them at 100 Park Avenue, New York 17, New York. #



In your Magic Circle... adventure starts at the end of your driveway



A hundred-and-one kinds of fun fan out before you, anywhere you drive. For you, the fun may be a crackling picnic fire like this. For anyone, it's a Magic Circle.



The view may take your breath away, fast as you draw it in. But to see how crisp and pure air can be—how exciting America is—head for the hills in your car.



Leave extra time for those extra discoveries, wherever you go. Maybe it's a puppy at a pet shop, a country auction, a trout stream tucked in the woods.



It's so easy to learn while you look, so comfortable and direct by car. History-rich landmarks of all kinds lie in free-wheeling distance of your driveway.

Just start your car and follow your fancy. From where you sit, a Magic Circle stretches away over a horizon 32 compass points wide.

It makes your car not just a way to go, but a wonderful way of life. For it is filled with laughter and discovery, majesty and homespun and quiet, a world full of things for the whole family to enjoy. Try it tomorrow, next weekend or your next vacation.

And wherever you drive your car, remember that there are over 200,000 service station dealers along the road. Knowing that trained, experienced help is as near as the next service station helps make motoring a carefree pleasure.

DRIVE MORE... IT'S FUN FOR THE WHOLE FAMILY

*See preceding page for story
on this experimental ad*



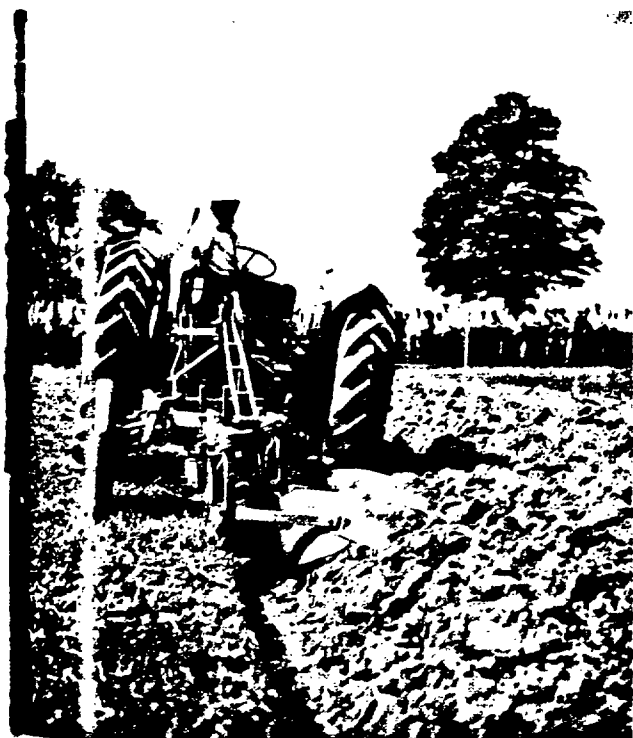
ETHYL CORPORATION
New York 17, N. Y.

*Manufacturers of "Ethyl" antiknock
compound—used by oil companies
everywhere to improve their gasolines*

ETC 30693

Ethyl News

SEPTEMBER - OCTOBER 1957

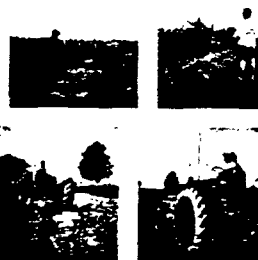


ETC 30694

Ethyl News

SEPTEMBER-OCTOBER 1957

Ethyl News



THE COVER: Four of the expert furrowers who competed in the fifth annual World's Plowing Contests in Peebles, Ohio, in mid-September. For more pictures and a report on the contests, see "Plowmen on Parade," pages 12-15.

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manufacturer of "Ethyl" antiknock compounds, used by oil companies to improve the antiknock quality of motor and aviation gasoline.

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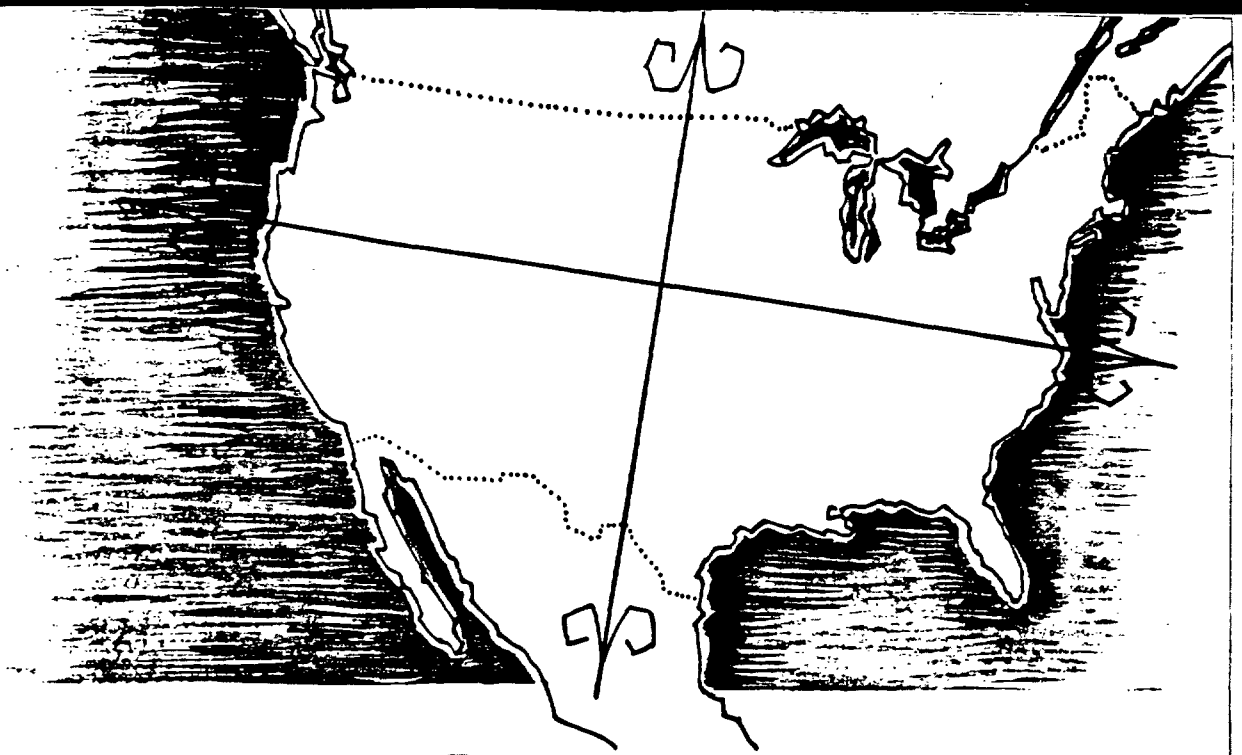
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ETC 30695



Ethyl Overseas

**Around the world, the Company's
products and services are
contributing to oil and
automotive progress**

In many once-primitive areas, 20th century industrialization is introducing automotive transportation.



NEVER BEFORE have great segments of the world's people chalked up the vast progress they are recording today. At a fast pace and on a broad scale, 20th century industrialization is reaching into one ancient area after another, setting the stage for new scenes in the drama of history.

Everywhere, automotive transportation is playing a leading role in the new progress.

Advances are coming especially fast in Latin America. While human populations there are growing at a record rate of $2\frac{1}{4}$ percent a year (about twice as fast as in the rest of the free world), motor vehicle populations are racing upward. In 1956, for example, automotive registrations increased over 1955 totals by five percent in Mexico, 10 percent in Cuba, 17 percent in Colombia, 19 percent in Argentina and 40 percent in Venezuela.

Oil refining capacity, of course, is growing fast too, to provide the fuels and lubricants for motor vehicles and other industrialization. In country after country, the Latin American refining picture is one of expansion and growth.

As the world's leading supplier of antiknock compounds, Ethyl Corporation—known overseas as ETHYL USA—is contributing to global oil and

automotive progress. In Latin America and in other key growth areas, antiknock compounds are essential to the economic production of present-day gasolines. They will be even more essential in the future as refiners provide fuels to meet the increasing requirements of modern engines.

A fully integrated manufacturing, research, sales and service organization, Ethyl Corporation currently serves refineries throughout the United States and around the free world. It is the world's largest supplier of antiknock compounds. The Company has two manufacturing plants in the United States. A third is operated by an affiliate, Ethyl Corporation of Canada Limited. In addition, Ethyl maintains large reserve inventories at its several storage terminals and is adding still more production capacity with the construction of another manufacturing plant in California.

More than 30 years of experience in preparing overseas shipments, obtaining export licenses, arranging for the most expeditious methods of shipment and the best routings, and in actually shipping antiknock compounds provides Ethyl Corporation with the know-how for getting its products to oil refiners throughout the world with maximum promptness and efficiency.

But beyond the manufacture and delivery of "Ethyl" fluid, the Company also provides many helpful services. Based on Ethyl Corporation's experience in working with the oil and automotive industries both in the United States and foreign countries, these services are tailored to meet the needs of individual refiners in specific locations.

Help Design Mixing Plants

Fundamental among these services is assistance in the safe and effective mixing of tetraethyl lead with gasoline. As new refineries go up throughout the world and existing ones are expanded, Ethyl representatives—backed by the Company's extensive experience—provide information and guidance in the design and construction of mixing plants best suited to individual needs.

Ethyl Corporation also provides instructional materials, including motion pictures, charts, manuals and bulletins, to help mixing plant employees do their work safely and efficiently. Many of these and other Ethyl instructional materials are published in Spanish and Portuguese for Latin American refiners, as well as in English.

In serving refiners overseas, Ethyl Corporation calls on its extensive scientific background to provide the research and technical assistance most helpful in particular situations. Especially valued by oil companies is the work of Ethyl's refinery technology section. This group is well versed in refinery economics and makes complete blending studies to help individual refiners produce desired gasolines most inexpensively. Depending on refinery equipment and local conditions, it helps refiners determine how to achieve maximum antiknock quality at the lowest cost and recommends most effective TEL concentrations.

An example of the widespread use of this service is seen in a joint research project presently being carried out by Ethyl Corporation's refinery technology section and YPFB, the government oil agency of Bolivia. This project is designed to work out steps for the economic upgrading of gasoline quality in Bolivia.

Cooperative Work in Brazil

Similarly, Ethyl and Petrobras, the Brazilian government oil company, are working together in evaluating that company's gasolines under actual road conditions. The findings are expected to furnish guide lines for the refining of improved gasolines for use in modern automobile engines in Brazil.

In still other instances, Ethyl has worked with the oil industries in Mexico and Japan to make the public aware of the need for gasoline quality improvements. South of the Rio Grande, the Company is cooperating with Petroleos Mexicanos (PEMEX) in the formation and operation of a Petroleum and Automotive Technical Advisory Committee (PATAC). This group, composed of oil and automotive experts, will cooperatively determine what is the best gasoline for the Mexican economy and for the country's automobile population. In Japan, Ethyl Corporation was partly responsible for the establishment of a joint refiners' association through which refiners are able to road rate their gasolines and provide motor fuels of adequate quality.

In gasoline testing, too, Ethyl Corporation has made a number of contributions. It has developed new test methods and equipment. Each year, it makes thousands of octane number determinations and other studies of fuels submitted by oil companies from throughout the United States and



Overseas, ETHYL USA representatives work closely with refiners in planning effective TEL usage.

around the world. In this connection, the Ethyl Research Laboratories currently are conducting a series of tests on gasolines and diesel fuels submitted by ENAP, the Chilean oil agency.

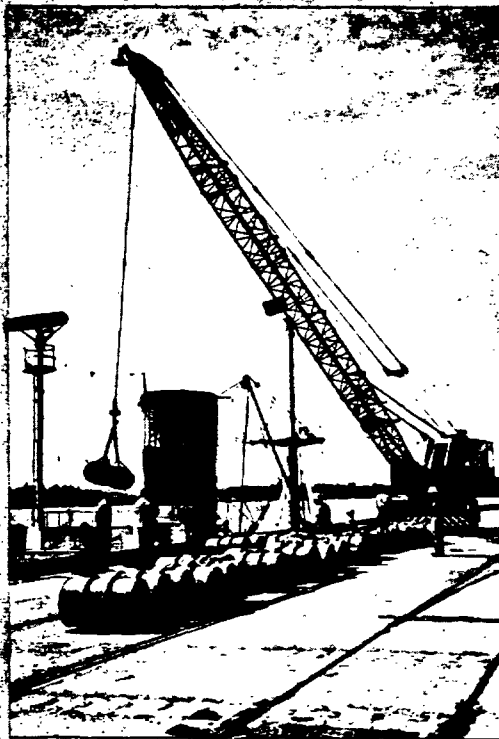
Recognizing that marketing practices and the characteristics of gasoline markets vary in individual countries around the world, Ethyl has been able to provide marketing assistance for a number of oil companies. It helps refiners plan and produce gasolines to fit specific markets and assists in evaluating fuels and in solving fuel-engine complaints which may arise. Ethyl assists in training sales personnel and in developing sales programs.

Product Sales Clinic

A case in point is the Product Sales Clinic, developed by Ethyl Corporation and used with great effectiveness by oil companies throughout the United States. This presentation was modified for use abroad and has been employed successfully in Mexico, the Caribbean area and Europe, to show the value of higher gasoline quality.

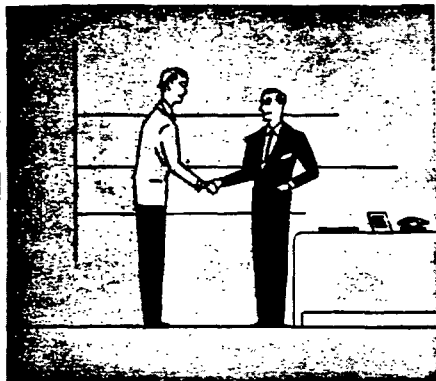
Around the world, automotive transportation—already a leading force in industrialization and progress—will make even greater contributions where the advantages of better fuels and engines can be realized.

By pointing up the advantages of improved fuels and engines and by assisting both privately-owned and government-controlled oil refiners in the manufacture of such fuels, Ethyl Corporation is contributing to the automotive progress that is contributing to progress in many of the world's areas. #



Above, Ethyl's experience in shipping its products assures offshore refiners of reliable on-time deliveries. . . . Below, some of the helpful instructional literature the Company provides.





The Hand of Fellowship

Ethyl survey reveals the part fellowships play in individual career advancement

By Thom Yates

THE SPONSORING of graduate research fellowships has for many years been one of industry's principal ways of supporting higher education. Ethyl Corporation, for instance, has conducted such a program continuously since 1937.

While the value of fellowships has long been appreciated, an exact measurement of their true worth has been lacking. It has been known in a general way that fellowships enable promising and deserving students to study for advanced degrees and that the increased knowledge they acquire usually stands them in good stead in their life's work.

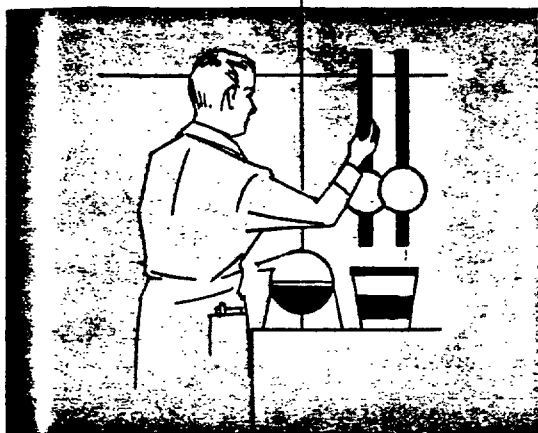
But specifically, what does a fellowship mean to the recipient in terms of his individual career advancement? Just how instrumental is the fellowship, and the higher education acquired under it, in later success? What do former fellowship holders think of industrial fellowships—the manner in which they are awarded and administered, their value in other than financial terms?

To find the answers to these and other related questions, Ethyl Corporation conducted a unique survey. The major findings of the survey have been compiled into a booklet now being offered to businessmen, educators, graduate students and others interested in the subject of industry aid to higher education.

In conducting the survey, Ethyl representatives interviewed former fellows now scattered throughout 23 states, the District of Columbia and Canada.



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So far as is known, the Ethyl survey is the only one of its kind ever conducted. For the answers to the more than score of pertinent questions, Company representatives went back to former Ethyl fellows, now scattered throughout 23 states, the District of Columbia and Canada. Each was personally interviewed in the belief that a face-to-face meeting would produce fuller, more meaningful comments than would replies to a form questionnaire. The results of the survey are especially valid since they are based upon interviews with not just a cross-section but with 93 percent of all recipients.

Fellows' Achievements

Ethyl was particularly interested to learn of the many singular achievements of the men and women the Company had assisted during their graduate study. At least six former Ethyl fellows, for instance, participated in pioneer applications of nuclear energy. Three plants recently constructed by a major chemical company are based on the patents of another recipient. A former Ethyl fellow has constructed a time-in-flight mass spectrometer that may prove useful in the oil industry. Two others are now heads of departments at major institutions of higher learning in the South. These are but a few examples.

It is conceivable that without a helping hand toward a master's or doctor's degree, the talents

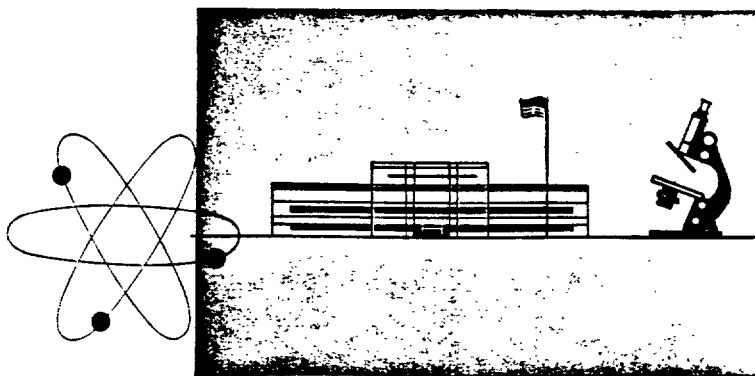
of such people might have been diverted to fields other than science. For, one of the facts established by the Ethyl survey was that the typical graduate student definitely needs financial assistance from an outside source in order to complete (and in some cases, even to undertake) advanced study.

Another significant finding of the survey is that most fellowship holders are satisfied, stable employees once they get out into the business world. Two-thirds of all those interviewed have had but a single employer since completing graduate study. Beyond that, former fellows, in overwhelming numbers, are happy where they are and will continue doing the type of work in which they are now engaged—very likely with the same employer.

Work Two Ways

As the new booklet points out, fellowships work in two directions. Just as Ethyl helped make possible the higher education of many scientists and engineers now employed by other companies, so does the Corporation employ a number whose graduate study was sponsored by other companies. In its Research and Development department and its Engineering department, Ethyl has 45 employees known to have studied under graduate fellowships financed by other companies and groups. Ethyl publicly acknowledges its gratitude to these companies.

The booklet that reports the highlights of the Ethyl survey is called "The Hand of Fellowship." Copies are available upon request from the Public Relations department, Ethyl Corporation, 100 Park Avenue, New York 17, N. Y. #





The Flight Safety Foundation specializes in preventing
aviation accidents and injuries because . . .

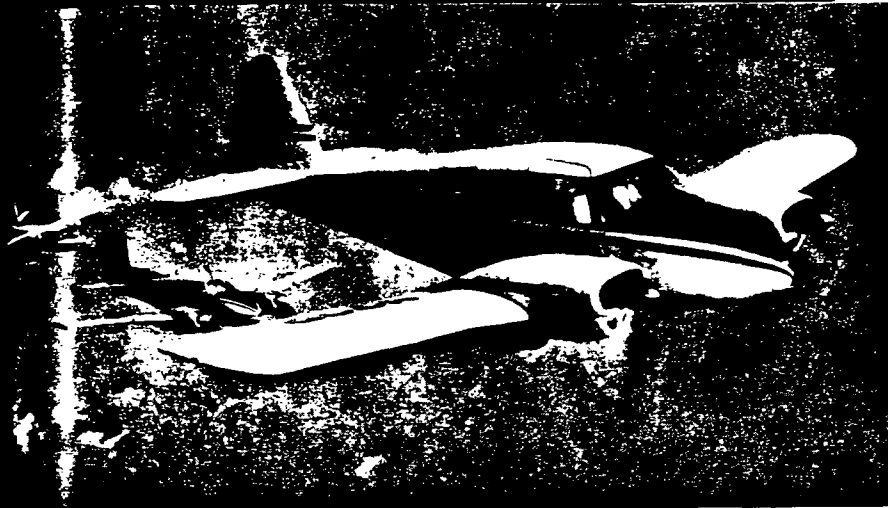
SAFETY IS ITS BUSINESS

By Stanton P. Nickerson

WITH AIRPLANE TRAFFIC increasing all the time, what can be done to insure maximum take-off and landing safety? How can the risk of midair collisions be reduced? Should seats face forward or toward the rear in newer and faster transports? Are exit doors ideally located? What are the ground hazards of high-performance radar?

These and hundreds of other aviation safety problems are important to airlines, aircraft manufacturers, government agencies and many other groups and organizations. They are the direct concern of the Flight Safety Foundation, more often called FSF. A non-profit agency, FSF is aggressively dedicated to a broad informational and educational program designed to save lives and prevent injury to people and property.

The FSF investigates and explores present-day flight safety procedures in order to bring about



Safer operations by the country's private and business aircraft are among the Foundation's primary concerns.

their improvement. One of its major endeavors is to circulate flight safety information more widely. With an eye to the future, it also focuses attention on safety problems anticipated in the years ahead.

The Foundation's work embraces such diversified members of the aviation world as mechanics, pilots, airport personnel, airline executives, plane designers, oilmen, aircraft engine manufacturers, the armed services and government agencies. Ultimately, of course, everyone who flies or depends upon aviation benefits from its work.

Typical of the endorsements of FSF is that expressed by Capt. Carl Christenson, United Air Lines safety director. Says Captain Christenson: Its work is "probably the most outstanding industry-wide effort yet being made in the field of safety."

The perspective and scope of the organization's work is not limited to the United States. It pro-

motes accident elimination and control throughout the free world. A focal point of its global activities is The International Air Safety Seminar FSF has scheduled for Palo Alto, Calif., in mid-November.

Close to 300 delegates are expected at this meeting. They will include representatives of intercontinental airlines, manufacturers of planes and engines used on long distance flights, safety engineers, officers of American and foreign military services and key government officials.

Addresses and discussions will cover safety aspects of the coming jet transport age, survival conditions on world-wide commercial air routes, ways of preventing mid-air collisions, high altitude weather, safety considerations in pilot selection and training, and the economics of flight safety.

In the United States, the Flight Safety Foundation focuses attention on comparable problems involving commercial airlines, company-owned and

Adm. John H. Cassady (right), FSF president, presents a certificate of corporate membership in the Foundation to an airline's officials.



operated aircraft, private planes and those used by the armed services. The FSF acts as a catalyst, clearing house and teacher of safety measures among all members of these air families.

When working cooperatively on safety with domestic commercial airlines, the FSF collects essential information about different carriers' safety programs, and passes this data along to others.

Experienced Staff

Whenever individual airlines request Foundation guidance on knotty safety problems, its experienced officers and staff are available at FSF headquarters in New York. Among them are the president, Admiral John H. Cassady, U.S.N. (Retired), former commander of the Sixth Fleet and often called "the father of Naval aviation safety." Managing director is Jerome Lederer, a past safety director of the government's Civil Aeronautics Board.

FSF helps business and industry, which fly more than 12 times as many planes as commercial airlines, continue their noteworthy safety record. The Foundation gives special attention to eliminating potential hazards in the maintenance and operation of some 23,000 executive aircraft and 5,000 others used for such things as crop dusting, geological surveys and highway patrols.

Recent and anticipated increases in the number

Jerome Lederer (right) FSF managing director, receives a scroll for contributions to air safety.



of company-owned planes are largely responsible for a new series of FSF regional meetings, replacing a single national conference held annually in the past. These began with a Business Aircraft Safety Seminar at Galveston, Texas, in September. Others will be held during 1958.

With the number of private planes also increasing, the FSF is actively at work to encourage more and safer flying by today's 57,000 pleasure aircraft.

To further both business and pleasure aviation safety, FSF keeps close contacts with aeronautical clubs, students learning to fly, pilots' associations, private airports, aviation writers and companies which make and equip small planes.

All aspects of the air transportation world share dividends accruing from special FSF projects. For example, courses in designing aircraft for maximum safety are conducted at Long Island University under the joint sponsorship of the FSF and the Cornell-Guggenheim Aviation Safety Center.

Learning from Literature

The FSF considers its bulletins, surveys, reports and special publications the best instruments it has to teach safety to the largest numbers of aviation personnel.

More than a million copies of Foundation literature were distributed in 1956, and an even greater number is being utilized this year. Ably written and liberally illustrated, they drive home vital messages with telling impact.

These and all other FSF projects are made possible by the financial support of more than 270 corporate and individual Foundation members. Among them are 16 major oil companies, every principal automobile manufacturer and a majority of airlines in the United States and Canada.

As for the future, the FSF is convinced that its work will continue indefinitely. As fast as present and foreseeable safety problems are solved, still more formidable ones are expected to develop. This has been true since the Foundation was established in 1945.

The age of supersonic flight is already here. The artificial moon may well be the first step to mankind's first venture beyond the earth's field of gravity. When we are ready to reach the moon and planets in interstellar flight, what could be more important than safety? #

J.H. Schaefer and G.O. Hayes Named to New Posts



John H. Schaefer

JOHN H. SCHAEFER, formerly Ethyl Corporation vice president in charge of manufacturing, has been appointed to the newly created executive position of staff vice president. In announcing the appointment, E. L. Shea, Ethyl board chairman, said it permits greater concentration on long-range studies free from day-to-day line management responsibilities.

Glenn O. Hayes, director of Ethyl's Employee Relations department and former manager of the Houston manufacturing plant, has been named general manager of the Manufacturing and Employee Relations departments.



Glenn O. Hayes

Baton Rouge Plant Completes 20 Years of Operation

THE ETHYL CORPORATION plant at Baton Rouge, La., the world's largest antiknock compound production facility, marked the completion of 20 years of manufacturing operations in September. Construction of the plant's first units started in October 1936, and eleven months later, in September 1937, a tank car of fluid, the first made in Baton Rouge, left the plant.

Over the two intervening decades, the history of the Baton Rouge plant has been one of continuous growth and improvement.

New construction continued from the beginning up to and during World War II as the plant was enlarged to meet ever-larger demands for "Ethyl" fluid for both civilian and military needs.

Soon after the end of hostilities, the Company launched a \$40 million expansion program at Baton Rouge and this was followed by still further enlargement of manufacturing facilities in the early '50's. Baton Rouge also became important as a research and development center and a large modern fully-equipped laboratory was built there.

With refiners' needs for "Ethyl" antiknock compound continuing upward, three manufacturing plants were added—the Houston plant in 1952, the Ethyl Corporation of Canada plant at Sarnia, Ont.,

in 1956, and the Pacific Coast plant at Pittsburg, Calif., now under construction.

Now the senior member of the Ethyl team of manufacturing plants, the Baton Rouge plant continues to make an outstanding contribution to the production of modern high octane gasolines. #

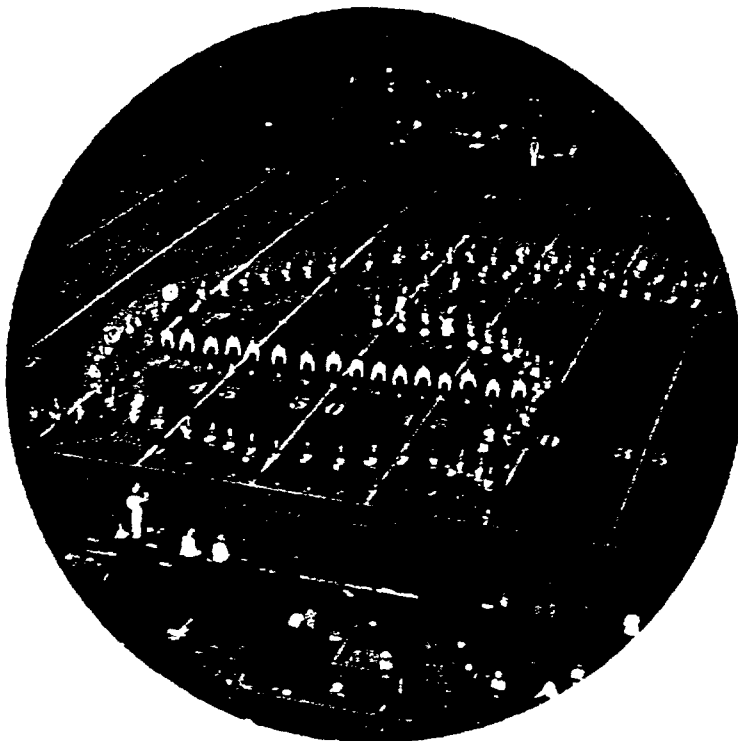
Management Appointments for New Plant Announced

ELEVEN MANAGEMENT APPOINTMENTS for Ethyl Corporation's Pacific Coast plant under construction at Pittsburg, Calif., have been announced.

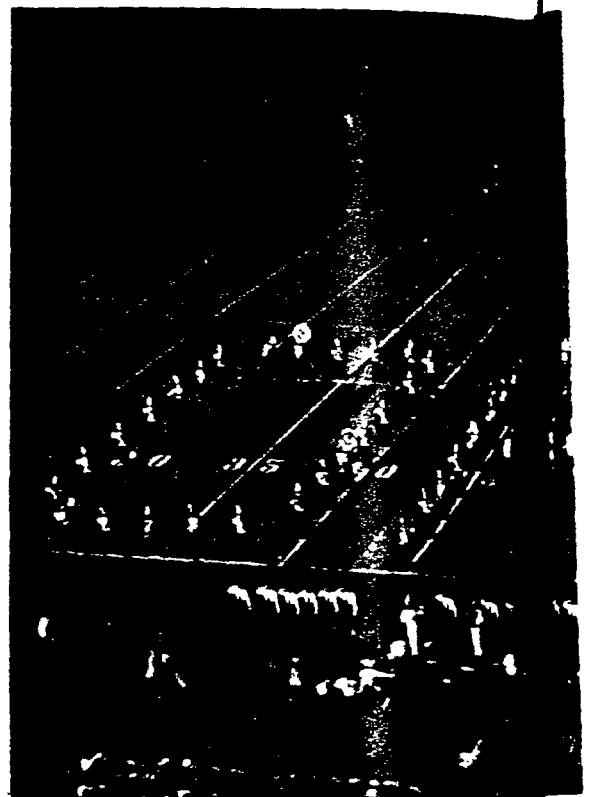
Those named to new positions are: Lloyd L. Reynolds, assistant plant manager; Feltus H. Wade, maintenance superintendent; James E. Rogers, operating supervisor; Earl S. Wirtz, industrial engineer; Robert D. Sinner, engineering superintendent; Walter G. Weakley, purchasing agent; William J. Splaine, chief accountant; Orland W. Cooper, plant chemist; John Elder, supervisor of maintenance; G. L. James, engineer inspector; and Eugene D. Hatfield, manager of employee relations.

All of these employees, with the exception of Mr. Hatfield, have been associated with Ethyl at either its Houston or Baton Rouge plant.

The Pacific Coast plant, which will manufacture "Ethyl" antiknock compounds, is scheduled to go into operation in mid-1958. #



The LSU band formation representing oil industry research takes the shape of a retort flask.



As a climax to their demonstration, the marching musicians...

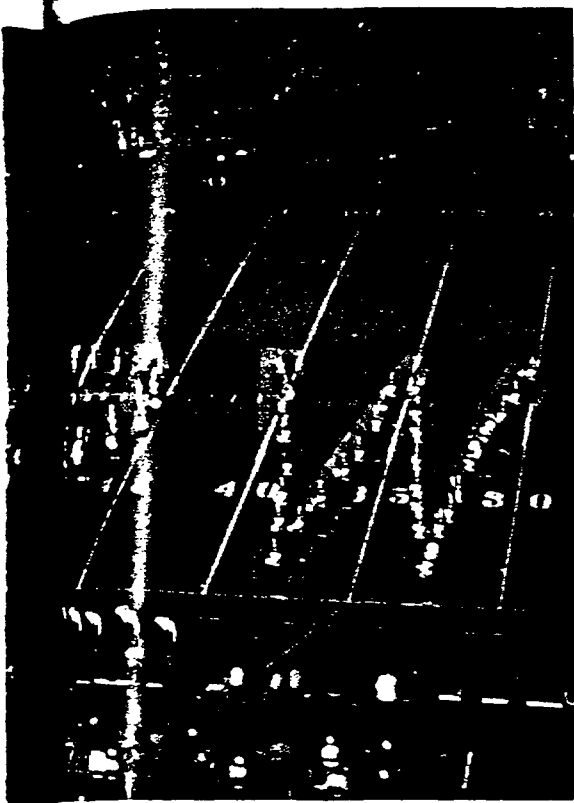
Beating the

**Louisiana State University band
executes petroleum patterns between
the halves of a football game**

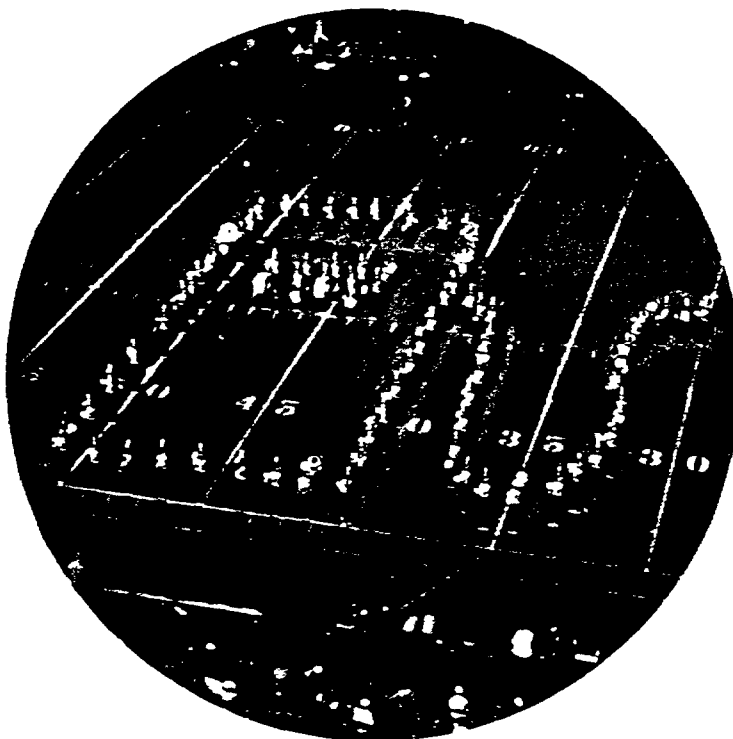
ENTERTAINING half-time performances by marching bands have become almost as much a part of college football games as forward passes, unbalanced lines and option plays. Along with cheering crowds, waving pennants, and big yellow chrysanthemum, they're one of the added attractions that make the gridiron sport the colorful spectacle it is these crisp fall days.

When players retire to locker rooms for relaxation and pep talks, snappily-clad musicians take to the field with precision formations and tunes that portray current happenings or events of significance to the competing schools.

In at least one college football stadium during Oil Progress Week in mid-October, the half-time



side the letters that abbreviate Oil Progress Week.



A gasoline pump, complete with dial face and hose, symbolizes marketing operations.

Drums for Oil

show was devoted to oil. During intermission at the Louisiana State-Georgia Tech game at Baton Rouge, La., the 80 men and 16 co-eds of the LSU band put on a stirring "Salute to Oil People."

Planned at the suggestion of Syl Lange, of Ethyl Corporation's Baton Rouge plant and the local Oil Progress Week committee, the performance depicted the industry from exploration, through production, transportation, research, refining, marketing and end use.

With precision and clarity the marching musicians moved from one formation into another while playing selections appropriate to each. In turn, they arranged themselves in the form of a seismograph drill truck, an oil well pump, a pipeline and valve,

a retort flask, a refinery tower, a gasoline pump and oil can, and finally in three huge letters—OPW.

Interspersed between the formations and the music was a brief commentary which was carried over the public address system and the radio, explaining to the thousands of spectators and listeners the continuity of oil industry operations represented. (Ethyl Corporation sponsors radio broadcasts of all LSU football games over a state-wide network.) As the band played its two final pieces, "Merry Oldsmobile" and "Marching Along Together," the announcer concluded: "As we drive along our highways and note the tremendous changes wrought by the oil industry, we join proudly in the celebration of national Oil Progress Week." #

Plowmen

Experts from 14 countries demonstrate their furrowing skill in fifth



Burnished plowshares bite into the loam of a contest field as competition begins.

The only horses in sight were those ridden by guards patrolling the huge crowds.



Water retention dams and other soil conservation displays built on the site attracted wide attention.



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Fifth annual World's Plowing Contests

IT WAS A FARM SHOW from start to finish, but Dobbin was nowhere in sight. Across the 2,500 acres of southern Ohio farmland the only horses to be seen were the few ridden by guards guiding the eager crowds.

Powerful modern tractors, on the other hand, were everywhere, adding brilliant splashes of orange, blue, green and red to the faded grass of the sprawling fields. Tractors were on display at manufacturers' exhibits. Tractors pulled wagon loads of spectators to soil conservation demonstrations, supplied motive power for mobil refreshment stands, and constructed water retention dams. Out in the contest areas, still other tractors pulled gleaming plowshares through the silty brown loam as expert plowmen fashioned arrow-straight furrows.

The fifth annual World's Conservation Exposition and Plowing Contests at Peebles, Ohio, in mid-September was a tribute not only to the skill of com-

peting plowmen but also to the importance of modern oil-powered tractors in efficient farming around the globe. Starting at the state contests on the first day, and continuing through the national and world championships, the spotlight was on tractors, plows and plowmen.

Attendance totaled some 250,000 over the four-day exposition and contest period. Farmers, soil and agriculture experts, government officials and families and friends of competitors came from around the world to witness the matches, demonstrations, displays and soil conservation exhibits. A huge tent city included oil company displays, tractor and implement manufacturers' exhibits and showings by scores of other agriculture-related industries.

Secretary of Agriculture Benson and Atomic Energy Commission Chairman Strauss spoke on succeeding days, emphasizing the importance of agricultural progress in feeding the world's bur-

On exhibit merely as curiosities, antique tractors contrasted sharply with modern units.



Lewis L. Strauss, AEC chairman; Ann Lane, Queen of the Furrow; and Senator John Bricker at the Cairn of Peace Mr. Strauss dedicated.



geoning millions and in building a solid and lasting peace.

In the world contests, plowmen from England, France, Belgium, Holland, Sweden, Denmark, Norway, Canada, the United States, Northern Ireland, New Zealand, Finland, West Germany and Italy pitted their skill against the land and against each other.

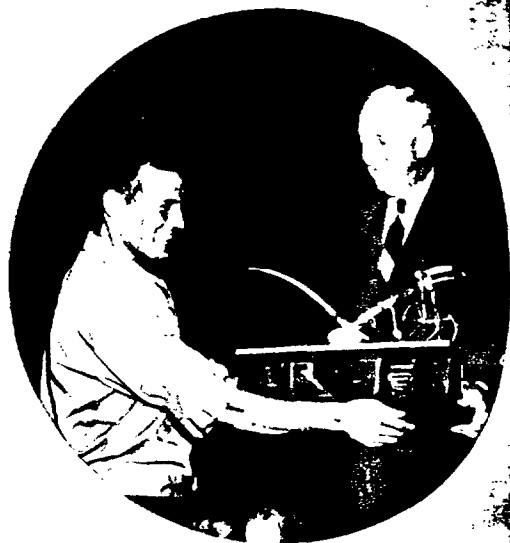
Late on the last day of the contest as shadows stretched across the plow-scarred fields, the judges completed their lengthy deliberations. Willem De Lint of Holland was declared the world's top plowman. John Mason of England was second and Arvo Jokinen of Finland third.

Golden Plow Presented

In recognition of his achievement, DeLint was presented the Esso Golden Plow by B. L. Ray, Esso Standard Oil vice president. Donated by affiliated Esso companies and emblematic of world plowing supremacy, the plow is a replica of a 17th century English implement which was the forerunner of practically all modern plows.

The contests did more than determine a champion. For a few days, at least, they focused international attention on modern farming and its importance in a hungry world.

Engraved in the base of the Esso Golden Plow is the Latin phrase "Pax arva colat" (May peace cultivate the fields). Certainly that is a universal hope and—partly because of the advances of modern agriculture—a brighter possibility. #



William DeLint receives the Esso Golden Plow from B. L. Ray, Esso vice president.



Peebles teen-agers, off from school for the week, manned tractor-powered mobile refreshment stands.

Oil company interest in the matches was seen in their donation of fuels and lubricants for competitors' tractors.

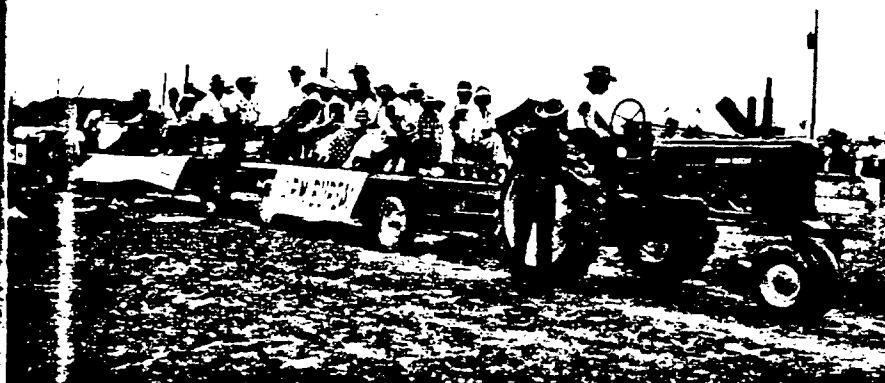




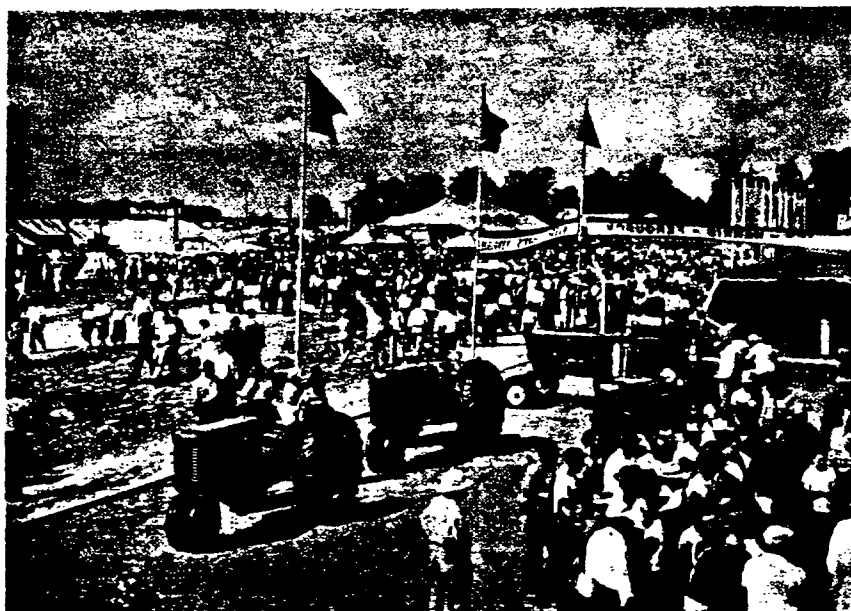
Champion plowman DeLint demonstrates his skill at the wheel of his tractor.



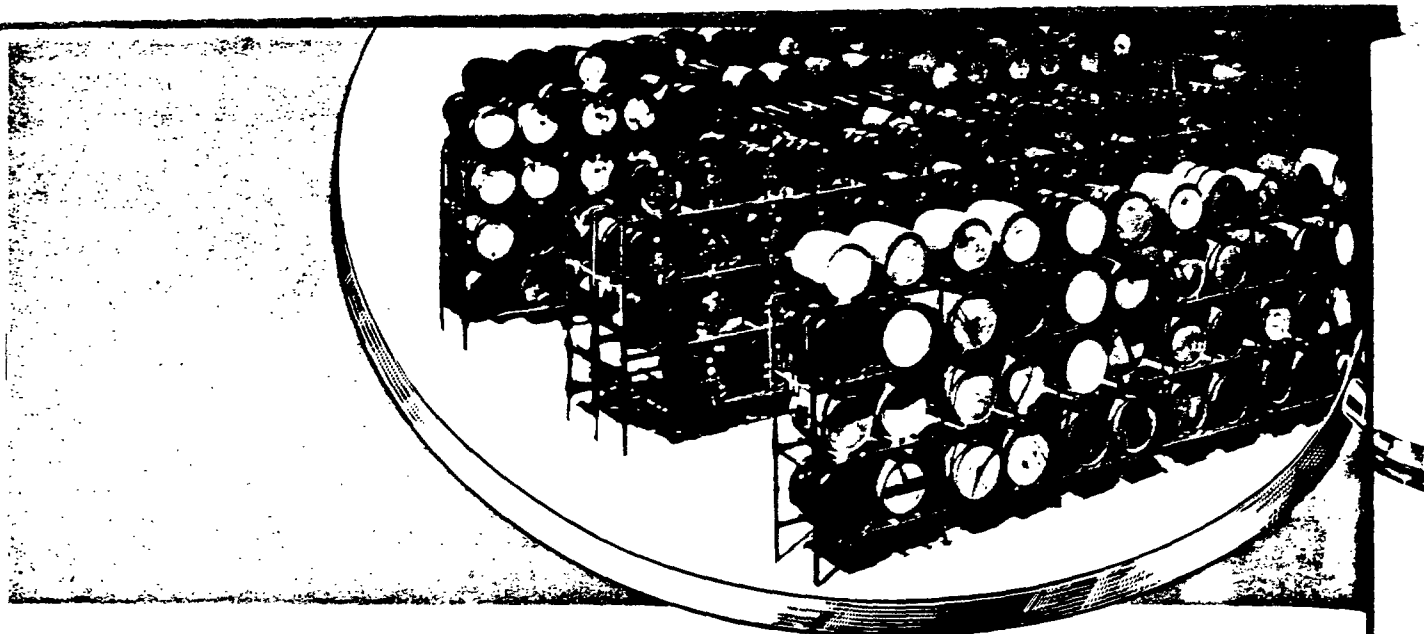
Runner-up Mason accepts the Massey-Harris-Ferguson bowl from Alfred Hall, of the World Ploughing Organization.



Rubber-tired wagons with hay bale seats and pulled by farm tractors took loads of spectators around the grounds.



Farm machinery and equipment manufacturers' displays attracted overflow crowds to the tent city's expansive midway.



Premium Gasoline Under the Lens

Findings of exhaustive Ethyl study are important to oil and automotive industries

FOR OIL REFINERS to look ahead is for them to look up—at least so far as the antiknock quality of motor gasoline is concerned. Higher octane numbers have been the pattern of the last several years, and, based on current trends in automobile engine compression ratios, they are expected to continue upward.

Working closely with refiners, Ethyl Corporation is well aware that additional octane numbers at today's high levels are both difficult and expensive. Accordingly, the Company is continually seeking ways to help refiners obtain them as economically and efficiently as possible.

An exhaustive survey of gasoline quality—the most complete and thorough ever undertaken—and a report on its findings is one of Ethyl's latest contributions in this direction. Based on extensive octane studies conducted at Ethyl's research laboratories, the report presents a detailed picture of what present-day premium type gasolines look like and the factors that affect their performance in automotive vehicles. The report presents a method for

predicting actual road performance of gasoline using only routine laboratory tests.

Because the findings of the survey are so pertinent to the development of motor gasoline and engines of the future, copies of the report are being made available to companies throughout the petroleum and automotive industries.

Some 90 refineries—83 in the United States and seven in Canada—participated in the far-reaching study. These refineries produce approximately 75 percent of this country's motor gasoline and 25 percent of Canada's. To make the survey even more complete, 12 samples of the new third grade super-premium gasolines also were analyzed.

The recently completed survey is in addition to the survey of premium and regular gasoline sold at service stations that Ethyl conducts every month. It is a continuation of similar programs conducted on a smaller scale in 1946, 1949, 1951 and 1954.

In conducting the survey, Ethyl obtained from cooperating refiners gasolines representative of the base stocks used in premium quality motor fuels.



An "electronic brain" was used to develop simple mathematical formulae which refiners can use to compute the road octane numbers of their gasolines.

Each refiner's sample was assigned a code number known only to himself. Tetraethyl lead was added to all the samples at the Ethyl laboratories in concentrations of three milliliters per gallon.

At the laboratories, the samples were exhaustively analyzed with special emphasis on hydrocarbon composition by type—i.e., aromatics, olefins and saturates. Then actual octane ratings were determined in vehicles on a chassis dynamometer.

The performance of the surveyed fuels in today's automobiles was no more important than the measurement of their performance in engine designs predicted for the near future. Automobile test engines selected were a mixture of current and future designs. Five of the test cars were 1957 models (Buick, Cadillac, Chrysler, Mercury and Oldsmobile) with compression ratios averaging about 10 to 1. Three additional test cars, equipped

with special experimental engines having 11 to 1 compression ratios, also were used.

The data obtained were fed into a digital computer and through the use of its "electronic brain" the mass of statistics was boiled down to simple mathematical formulae. By using these formulae, it was determined, refiners can tailor-make fuels that will satisfy present and future automobiles.

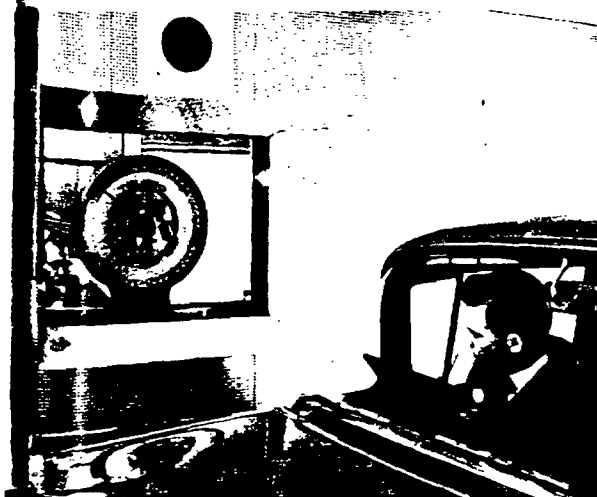
Test Fleet on Desk Top

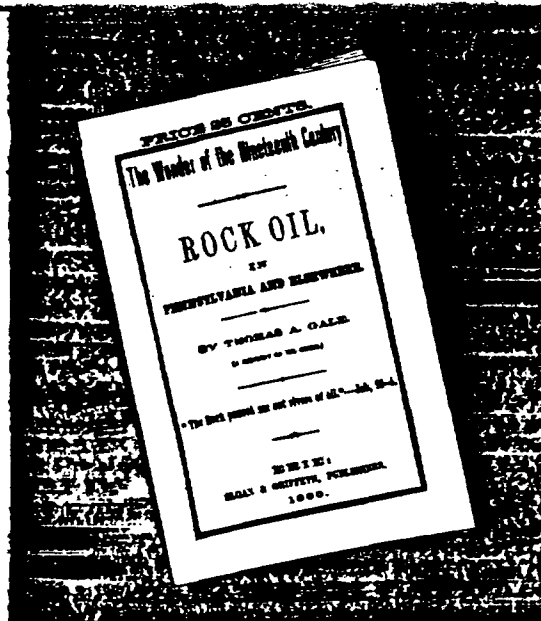
The use of these mathematical relationships permits the calculation of road octane numbers without undertaking the expense of actually measuring them by conventional road test methods. This, of course, is a big time and money saver for refiners. In effect, it puts a test fleet of modern cars on the top of their desks.

By using the data provided in the Ethyl survey and the equations that have been developed, refiners will be able to analyze their own motor gasoline blends by simple laboratory tests. They will be able to locate deficiencies in present fuels and plan the manufacture of those of the future.

The full report of the survey, contained in "Anti-knock Quality of Premium Fuels," is intended for petroleum and automotive people who are primarily concerned with the development and manufacture of fuels and engines of the present and the future. For executive personnel who may not require all the details, Ethyl has prepared a smaller booklet in which the data and information have been condensed and summarized. #

Actual octane ratings of fuels being tested were determined in Ethyl's chassis dynamometer rooms.





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 realized, 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 books.

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.

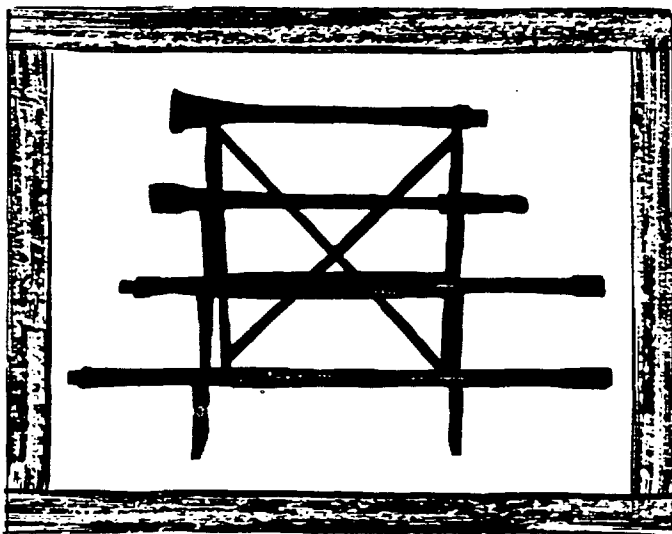
Questions Answered

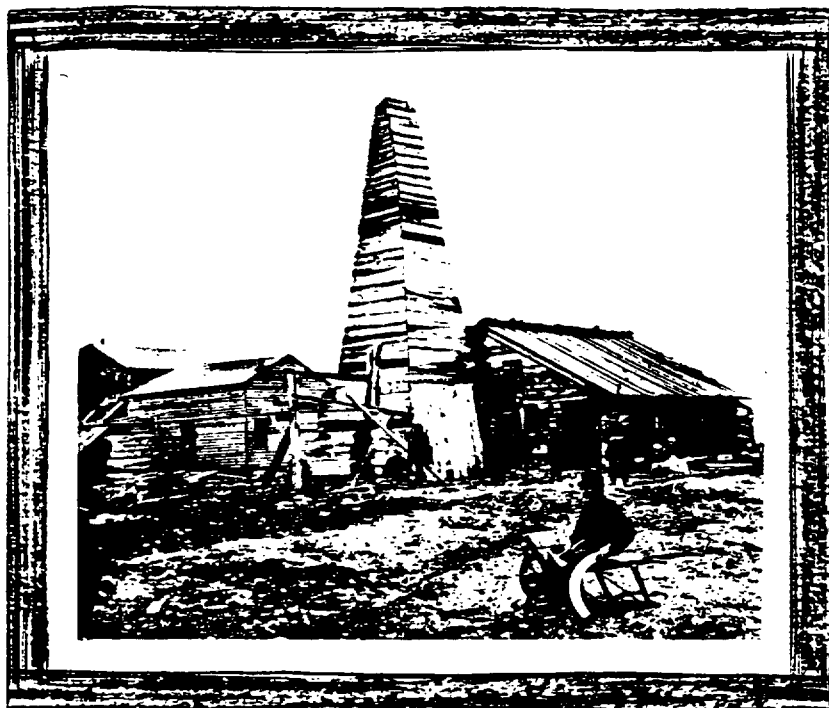
Apparently great quantities had been trapped hundreds of feet underground in northwestern Pennsylvania. But how did the oil get there? How difficult and costly was it to secure? Was there enough to supply light and lubricants for everyone?

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 Drake well was less than a year old when Thomas Gale's amazingly informative "Rock Oil" was published to satisfy some of the public's curiosity about the origin, production and uses of petroleum.

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. #



Giving Santa a Lift



An Esso plane speeds Christmas toys to underprivileged youngsters

CHRISTMAS, the poet said, comes but once a year. But for Wes Keppel and a dozen other Esso Standard Oil Company employees, December 25 pops up on the calendar as early as May. That's when they start planning the company's part in Operation Toylift, a heart-warming project that brings happiness to 50,000 underprivileged youngsters throughout the Northeast.

By now, of course, details for this year have been worked out. Starting November 30, an Esso plane will fly a jolly Santa Claus, accompanied by a live reindeer and cartons of toys to eagerly expectant boys and girls in cities and towns from Quebec to Charlotte, N. C., and from Boston to Cleveland. From then until December 8, the flying contingent will cover 15,000 miles, spreading joy in four or five cities a day until some 35 stops have been made in a dozen states, the District of Columbia and two Canadian provinces.

Because of the size and bounty of Santa's airborne pack, 20 tons of gifts will be waiting for wide-eyed youngsters under the trees of 200 orphanages, charity hospitals, shelter homes and similar institutions on Christmas morning.

This is the seventh consecutive year that Esso has donated the plane for Santa's Operation Toy-

lift, a national tax-exempt charity with headquarters at North Pole, N. Y., high in the Adirondack Mountains. A percentage of all money taken in at Santa's Workshop, a tourist center at North Pole, goes to the charity plus money donated by visitors and other friends of the work.

On a typical Toylift day, an Esso C-46 transport, brightly painted with holiday decorations, takes off from North Pole early in the morning. Esso flight and arrangements crews and Workshop representatives in gay costumes accompany Santa, his gifts and his reindeer on their rounds.

Airport Get-togethers

When the plane lands at airports in preselected cities, excited boys and girls from children's institutions crowd close to shout their greetings to the right jolly old elf in the red suit. Some even get a chance to sit on his lap, stroke his genuine white beard and pour their childish wishes into his attentive ears. Before leaving, Santa distributes lollipops to one and all, but within an hour or so he must be on his way to the next scheduled stop.

While Santa is entertaining his young admirers, boxes of gifts for Christmas morning opening are unloaded for subsequent delivery to the orphanages

and homes from which the boys and girls have come. This job and transportation of the youngsters to and from the airport usually is handled by a local civic or charitable organization.

Christmas may seem quite remote to most people in May and throughout the summer months, but that's none too soon for the Esso and Santa's Workshop people to begin making plans for Operation Toylift. Mr. Keppel, a member of the oil company's Public Relations department, and the others who work with him are responsible for flight scheduling, corresponding with the children's homes and even arranging for meals for the flying Santa Claus and his helpers.

While these plans are going forward at Esso's headquarters in New York City, Santa's Workshop, 300 miles to the north, is far from inactive. Despite its seasonal name, the cluster of storybook log cabins with crooked chimneys poking through brightly painted roofs attracts visitors the year round. Santa himself greets arrivals as they head for the village square and its perpetually ice-encrusted North Pole.

Inside the buildings, helpers garbed in gnome-

like costumes bustle about their work as toymakers, blacksmiths, potters, glassblowers and silversmiths. They are turning out the toys that the company will sell and those that Esso will help distribute.

The North Pole Corporation, which owns Santa's Workshop, contributes more than \$30,000 worth of playthings annually. More money comes from toy parts suppliers and from half a million tourists who annually toss several thousand dollars in coins into a wishing well. Now a recognized national charity, Operation Toylift also welcomes gifts from the general public.

Outgrew Piper Cub

This widespread manifestation of the Christmas spirit had its beginning in 1949 when the toy company gave playthings to 2,000 children at 60 orphanages throughout New York state. In those days, a Piper Cub was large enough to handle the distribution, but the weight of Santa's bulging pack soon grounded it. When word of this plight reached Esso, the company volunteered to lend, staff and fly its C-46 for the purpose.

It has been helping ever since. #



Colorful posters announce Santa's arrival in cities throughout the Northeast and when his plane lands large enthusiastic crowds are on hand to greet him.



A Metho

A first-person account of how the

By Dr. Charles A. Kraus



ABOUT THE AUTHOR

DR. CHARLES A. KRAUS was graduated from the University of Kansas in 1898 with a degree in electrical engineering and has been associated with colleges and universities ever since. He is professor of chemistry and former director of chemical research at Brown University. He joined the faculty there in 1924 after leaving Clark University, Worcester, Mass., where he was professor of chemistry. Now retired from Brown, Dr. Kraus continues as a consultant for General Corporation.

During World War II, he served as consultant for the Manhattan District's atomic bomb project. Dr. Kraus also contributed to the wartime development of the oxygen rebreather, used on aircraft carriers. For this work he received the Distinguished Public Service Award, the highest honor conferred on civilians by the Navy.

Dr. Kraus is a former president of the American Chemical Society and holds the Society's most distinguished award, the Priestley Medal. He also is a recipient of the Nichols Medal and the Willard Gibbs Medal from the New York and Chicago sections of the ACS. Dr. Kraus has been honored with other awards for outstanding achievements in chemistry and holds honorary degrees from several colleges and universities.

WHEN the Charles F. Kettering-Thomas Midgley research team discovered tetraethyl lead as a gasoline antiknock a few weeks before Christmas in 1921, it found what still is the most efficient and economical product of its kind.

But vital as it was, discovery of the fuel additive was only the first step in banishing knock. Equally important was developing a way to manufacture tetraethyl lead economically—so it could be made available to motorists at a reasonable price.

Midgley and his coworkers had developed a manufacturing process involving the reaction of a sodium-lead alloy and ethyl iodide in the presence of a catalyst. Sometime later in 1922 they substituted ethyl bromide for ethyl iodide and almost day-by-day refined the ethyl bromide process. But Tom Midgley still was not satisfied.

In this Clark University chemistry laboratory, Dr. Kraus and his assistants did their work.



In the Making

Bridge process for making tetraethyl lead was developed

There were several shortcomings to the ethyl bromide process. Bromine was both scarce and expensive—and highly corrosive.

So things stood in the fall of 1922 when I was asked if I thought I could be of assistance in developing a process by which tetraethyl lead could be made in quantity at a reasonable price. At the time, I was the entire chemistry faculty at Clark University in Worcester, Mass., and had done some rather exhaustive research in the field of organo-metallic compounds.

Challenging Assignment

The new assignment was quite a challenge and I was keenly interested in seeing what I could do. Since my work on development of the TEL manufacturing process was to be conducted right at the University laboratory, it was possible for me to continue as professor of chemistry.

Needing an assistant for the undertaking, I thought immediately of Conral C. Callis, who had just finished graduate study at Clark. We had made the investigations of methyl tin compounds together and I was confident that he could make valuable contributions to the TEL process assignment. His reply to my request was that he would be delighted to work on the project.

October 1, 1922, was the official starting date of our experiments. In our attempt to develop a satisfactory new TEL manufacturing process, we decided to proceed on the basis of our previous experience with tin compounds.

Chemically speaking, there is very little difference between tin and lead. It seemed logical to us that if alkyl halides like methyl iodide and methyl chloride in reaction with sodium-tin alloy would produce satisfactory yields of alkyl tin compounds, we would do well to attempt to make tetraethyl

Since the ethyl chloride method for making tetraethyl lead was developed in 1923, millions of dollars have been spent in the construction and operation of manufacturing plants employing the method.



lead with some suitable member of the alkyl halide family. We eliminated bromine and iodine from consideration because both were expensive. So the reaction of sodium-lead alloy and ethyl chloride appeared to represent the only practical solution.

Neither Callis nor I was familiar with tetraethyl lead. In fact, nobody in those days knew much about organometallic compounds. While getting together the necessary apparatus and equipment for our work, we made some tetraethyl lead for laboratory use by the established method of reacting sodium-lead alloy and ethyl iodide. Our first piece of equipment—all homemade—was an autoclave of about three-liter capacity. We made this from a section of heavy steel tubing about 15 inches long and about four inches in diameter.

Six-hour Reaction

We hooked up a motor to revolve the autoclave while the reaction was taking place. Then we put several steel balls about one-half inch in diameter inside the autoclave to agitate the contents. The reaction, under pressure, took about six hours. When it was complete, we separated the tetraethyl lead from the reaction by steam distillation.

In June 1923 we began conducting our experiments in a larger reactor. As our work progressed, we realized higher and higher tetraethyl lead yields from the ethyl chloride process in the laboratory. Before long we were getting average yields in the 70-75 percent range. Once or twice, I remember, we got a yield as high as 86 percent. This was several times the yield that was being obtained under the earlier ethyl iodide method.

One factor responsible for the high yields, we realized, was a rather important discovery Callis and I made regarding the composition of the alloy. Midgley and his associates and also a laboratory group at Massachusetts Institute of Technology had tried ethyl chloride with no success. But they were using a sodium-lead alloy containing a greater proportion of sodium than lead.

These alloys were reactive with ethyl bromide in the presence of a catalyst but the results were very disappointing with ethyl chloride.

After experimenting with a dozen or so alloys, we found that with ethyl chloride the best alloy had a composition corresponding to the formula NaPb . It was not necessary to add a catalyst to this alloy and a smaller proportion of sodium was

required. Thus the sodium-lead alloy we developed was more economical, as well as more efficient than its predecessors.

At this point Callis and I were ably assisted by two graduate students at Clark—Dr. Raphael Rosen and Dr. Willard Greer. These men spent many long and devoted hours on the ethyl chloride process study during the summer of 1923. Actually, Callis, Rosen and Greer did most of the testing and laboratory work. I merely directed and guided the project.

We, of course, were in no way concerned with how TEL behaved in gasoline. But I remember how Callis and the others used to "test" the product. They would take some of the tetraethyl lead we made in the laboratory and add it to the gasoline in their cars. Immediately, the cars performed more powerfully, efficiently and economically even with the TEL so unscientifically blended with the gasoline.

Toward the end of 1923 we were reasonably certain of the commercial applicability of our ethyl chloride process. Success came none too soon, "Ethyl" gasoline was already on the market.

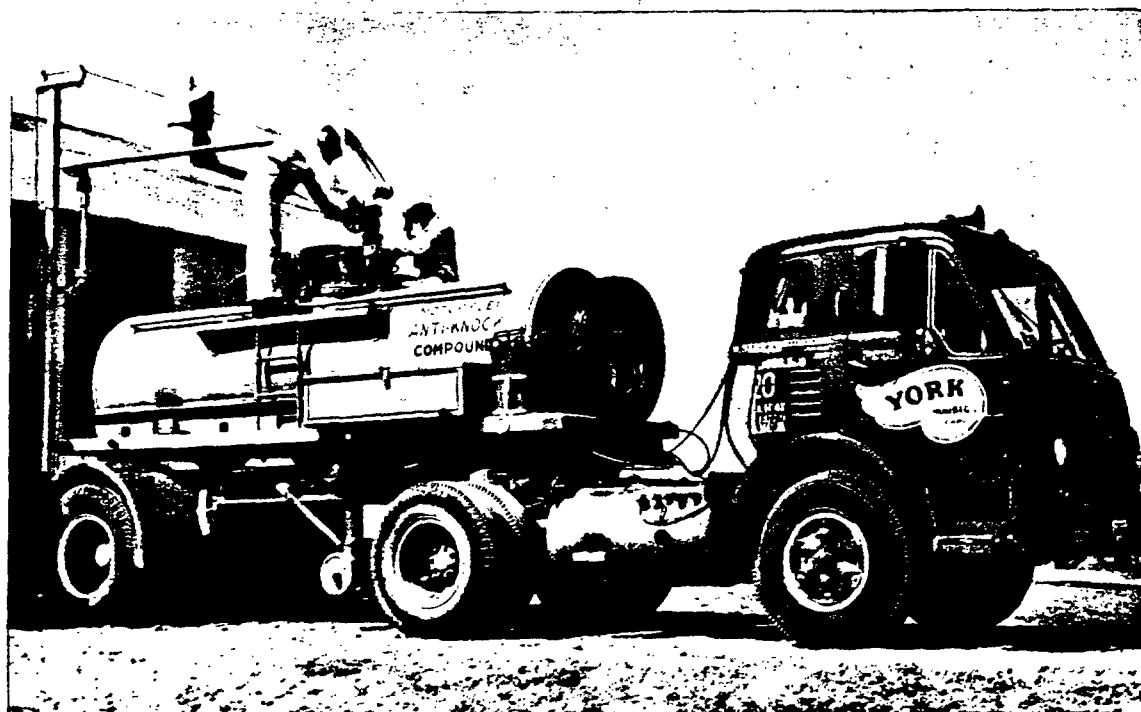
The small pilot plant unit with a capacity about one-half gallon of tetraethyl lead we had been using was transferred to Bayway, N. J. From there, we worked out further details for applying the process to large-scale operations.

Project at an End

Having developed a convenient, practical, economical method of making tetraethyl lead, the project was at an end so far as we at Clark University were concerned. It was an engineering problem from there on—adapting the so-called Kraus-Campbell method to large-scale production.

In 1924 antiknock compound research was consolidated in order that a more concentrated effort could be made to develop widespread and general use of the new product. Ethyl (Gasoline) Corporation was formed the same year to take charge of the whole enterprise.

This is not to say that my interest in tetraethyl lead terminated. Far from it—particularly since the product still is made by the process I helped to create more than 30 years ago. To this day I have remained in close touch with the project and its success through my consulting work with Ethyl Corporation. #



SHIPPED VIA TANK TRUCK

AS THE LATEST STEP in its continuing efforts to improve antiknock compound delivery services, Ethyl Corporation has instituted tank truck shipments from its manufacturing plant at Houston to refiners in that area. Where small-quantity deliveries of "Ethyl" fluid are desired, a 935-gallon-capacity tank trailer hauled by a commercial truck is now being used. Larger capacity tank trailers are planned for the near future.

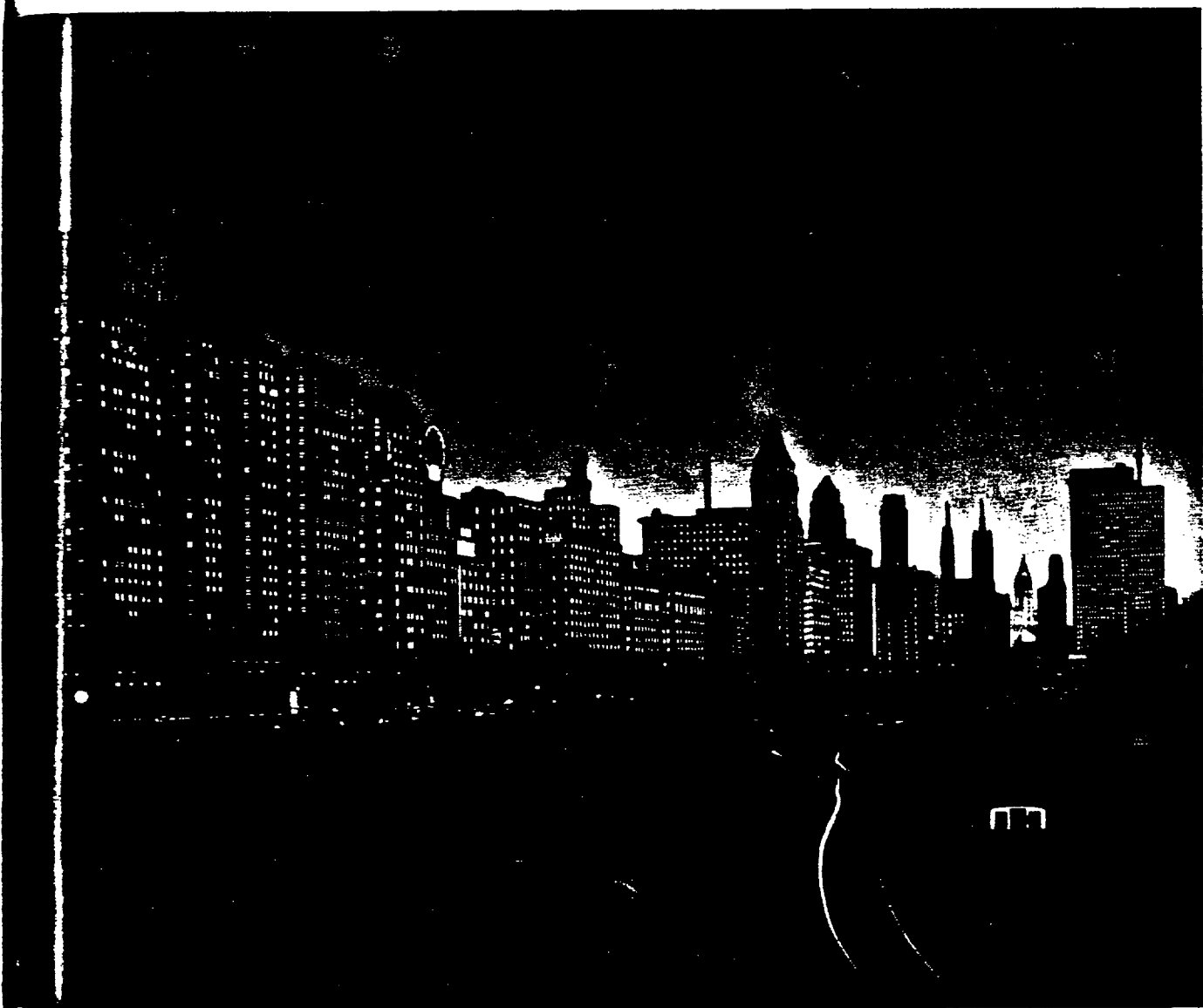
First shipment using the new equipment was made in mid-September when the tank truck carried a load of fluid from the Ethyl plant to the H. L. Hunt refinery at Harleton, Texas.

While tank truck shipments of "Ethyl" antiknock compounds are new in Texas, they are not new to Ethyl Corporation. The Company introduced such shipments as early as 1933. Tank truck deliveries currently are available from Ethyl's Los Angeles storage terminal at Wilmington, Calif., and from its East Coast storage terminal at Edge Moor, Del., as well as from the Houston plant.

Tank truck deliveries will be available to more refiners on the West Coast when the new Ethyl distribution terminal at Everett, Wash., is completed this fall and the new Pacific Coast manufacturing plant at Pittsburg, Calif., opens in 1958. #

ETHYL NEWS

NOVEMBER-DECEMBER 1957



API Annual Meeting Issue

ETC 30721

American Petroleum

NOVEMBER-DECEMBER 1957

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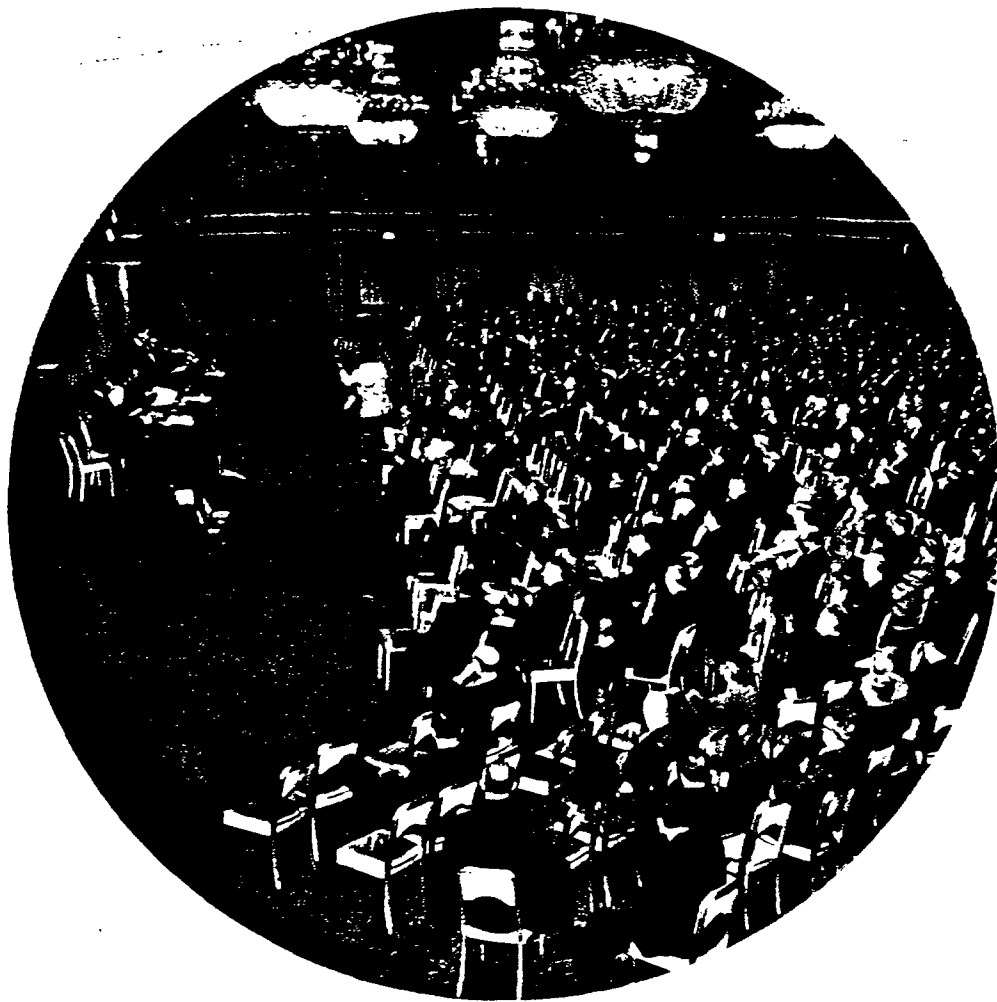
THE COVER: Michigan Avenue, its skyline and its big hotels represent Chicago to most oilmen attending the API annual meeting. Beneath the skyline, inside the hotels, as the pictures on the following pages show, attentive groups of petroleum industry representatives gather in numerous sessions to hear informative speakers. (Cover color photograph courtesy Otis Elevator Company.)

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Institute Annual Meeting Issue



Only one other annual meeting of the American Petroleum Institute has exceeded the 37th in attendance, and none can claim a more worthwhile program nor a greater amount of work accomplished. Meeting at a time when many people were voicing doubts about America's future security, oilmen gathered in Chicago in November 1957 demonstrated once again that contributions to the betterment of the free world still are the goals of the petroleum industry. ETHYL NEWS hopes that some of the significant highlights of the productive gathering are reflected in this its 13th pictorial coverage of API annual meetings.—*The Editors*

Edmund Vitano



Arriving by cab are Socony Mobil men Roger M. Wilkinson, Paul H. LeFevre and Paul A. White.

FROM across the United States and Canada, from the old countries of Europe and even from newborn Ghana, oilmen made the rewarding trek to Chicago for the 37th annual meeting of the American Petroleum Institute, Nov. 11-14, 1957.

In all, 6,455 men and women associated with the great industry "signed in" for the second largest (6,477 in 1954) gathering in the history of the Institute.

The Conrad Hilton served as main headquarters, but the large attendance spilled over to the Bismarck, Palmer House, Congress, Sheraton Blackstone and other hotels.

Signing up for their hotel rooms are Charles W. Springer, vice president of Graver Tank and Manufacturing; James L. Gaskell, Louisville Refining; and George A. Wilson, president of TXL Oil.



Standard of Indiana vice presidents J. K. Roberts and R. C. Guinness, and Richard G. Keppler, of American Cyanamid, register at the Hilton.

At the
Wattle
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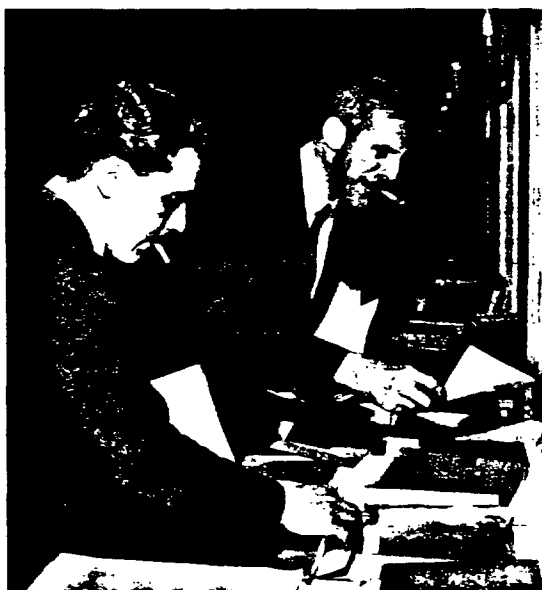
At the API registration desk are Earl Watley, Socony Mobil, and Fred L. Koopman, Phillips Petroleum.



Signing in Sunday were Maynard Taxman, Advance Refining president; Hymie Milder, president of Milder Oil; and Milo W. Taxman, Advance Refining secretary-treasurer. The Taxmans are brothers.



Above, A. L. Wiest, Shell Oil, and Col. Martin B. Chittick, Pure Oil (retired), go over some notes.



Selecting literature are Kenneth S. Cuddington and John W. Hyde, both of British Petroleum.



Left, Guy B. Hunter, Quaker State Oil board chairman, and Thomas G. Wise, Husky Oil vice president, call friends on lobby telephones.

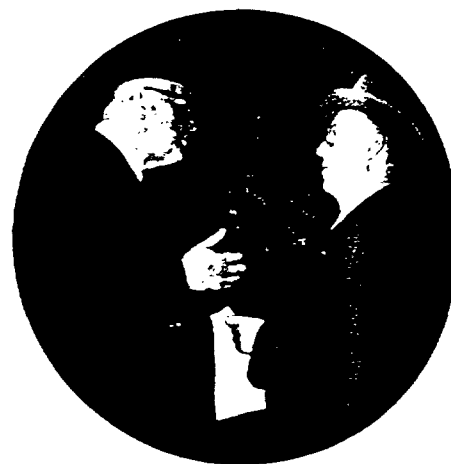
Signing In



Bay Petroleum Corporation sales representatives James H. Perry and William B. Uhlhorn, soon after arriving in the hotel lobby.



Walton T. Davis, president of Aetna Oil, and Board Chairman W. A. Jones and President B. S. Watson, of Cities Service, registering for the annual meeting on Monday.



Right, two company presidents in a visit are Bernard L. Majewski, Great American Oil, and James E. Dyer, Sinclair Refining.

Hard at work behind the registration counter are three members of the API staff: Rosemary Durso, Edward C. Belefski and Henry A. Fondu.



David W. Patterson, of Universal Oil Products; and Herman G. Gunter, vice president, and Charles J. Quigley, both of Commerce Oil Refining, smile happily.



ETC 30726

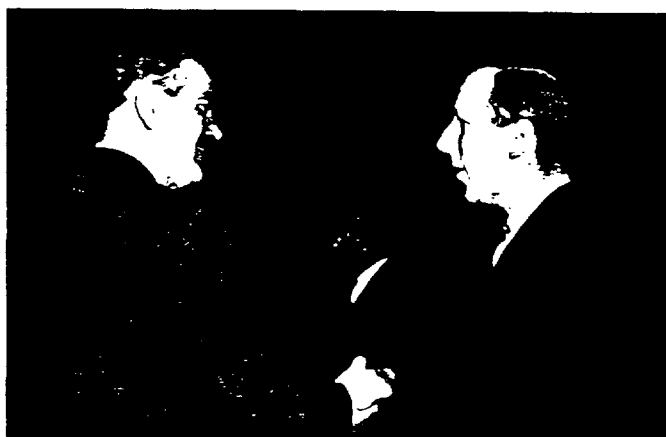


Above, Ray P. Frey, Imperial Oil, and E. A. Paschal, vice president of Coline Oil, were two of the many Sunday arrivals.

Right, the registration directory provided an easy way to find friends at the meeting.



J. G. Wilson, Shell Oil, and A. W. Ackerman, Badger Manufacturing, greet each other.



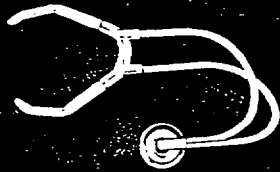
A. F. Ryan, Ethyl Corporation; Joseph L. Nolan, Farmers Union Central Exchange; and Frank Starling, of the Starling Co., pause for a chat.



Martin V. Halloran, Petroleum Refiner; H. G. Fitzpatrick, World Oil; and W. B. Colvin, Texsteam Corporation, in the Hilton drug store.



ETC 30727



MEDICAL



Dr. Jack R. Ewalt, Harvard Medical School, who spoke on "Emotional Problems In Industry."

David T. Staples, Tidewater president and API Medical and Health Committee chairman, presided at the group session on Monday.

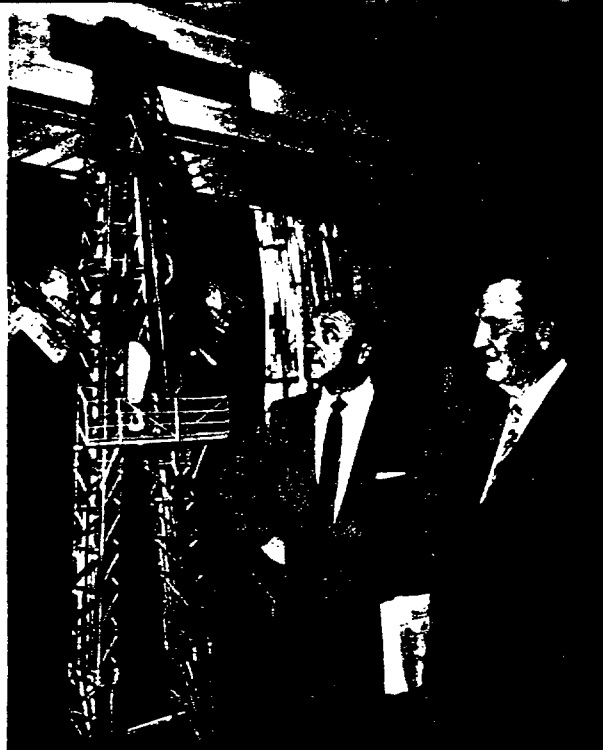


Dr. Louis N. Katz, of Michael Reese Hospital in Chicago, talked on "Your Heart—Your Job" at the session.



Dr. L. E. Curtis, Standard of California, is chairman of the Medical Advisory Committee which met Wednesday.

EMOTIONAL HEALTH PROBLEMS of employees and management are a major cause of time and production loss in industry, Dr. Jack R. Ewalt, clinical professor of psychiatry, Harvard Medical School, told the Medical and Health group session on Monday. He called for some kind of preventive or emotional first-aid program to be built into health and personnel systems. At the same session, Dr. Louis N. Katz, of Michael Reese Hospital, warned that diet has a great deal to do with causing heart disease. He stated that "we are living off the fat of the land, and the fat is killing us." David T. Staples, president of Tidewater Oil and chairman of the API Medical and Health Committee, presided at the session.



Two medical directors pausing between meetings are Dr. Clark R. Miller, Tidewater, and Dr. John C. Ruddock, Richfield.



Dr. Tom Hall Mitchell, Carter Oil, and Dr. J. H. Hege, Ohio Oil, at the Medical Advisory Committee.



Part of the audience that attended the Medical and Health group session.



Right, an overall view of the Medical Advisory Committee. Dr. George M. Saunders, Socony Mobil, is speaking.

Fundamental



Certificate of appreciation recipients at the group session included L. Laskaris, Atlantic Refining; Frank R. Clark, Ohio Oil (retired); Sherman S. Shaffer, Humble Oil & Refining; and Hugh W. Field, Atlantic Refining vice president. Mr. Field also was a speaker.



One group of speakers at the session was comprised of W. J. Yost, Ohio Oil; C. I. Alexander, Magnolia Petroleum; and J. E. Sherborne, Union Oil.



Wayne E. Kuhn, of The Texas Company (right), presents a silver tray to Robert E. Wilson, Standard of Indiana board chairman, for his leadership in API research activities. Dr. Wilson presided at the session.



Sinclair Research men all are session-goers Gerald B. Hoekstra, Paul A. Brunner, John E. Master and David E. Crouse.

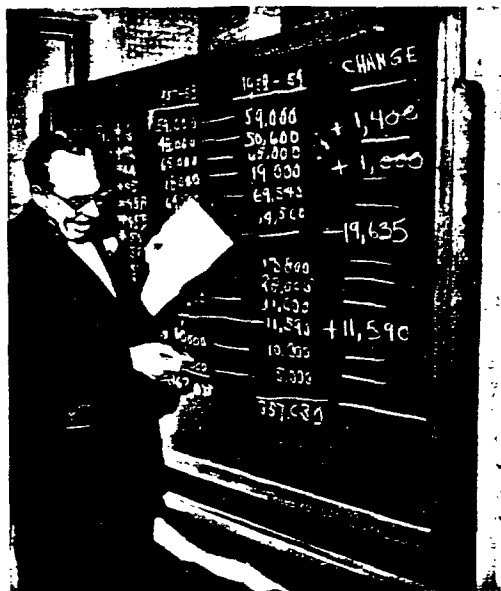
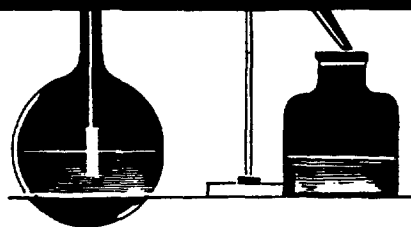
Research

FUNDAMENTAL research, so essential to the nation's security and economic welfare and no less important to the oil industry, occupied an important part of the stage at the 37th annual meeting. A group session was held Monday morning and committees met on several days of the gathering. At the group session, papers were presented on petroleum composition research, on research on the antiknock properties of pure hydrocarbons, on geological research, and on the geochemistry of uranium and lead. In his talk, Monroe E. Spaght, Shell Oil executive vice president, pointed out how cooperative API research has benefitted science and all mankind at a minimum expenditure of money since it was instituted 31 years ago.



Monroe E. Spaght, Shell Oil executive vice president, spoke on "Bargain in Brains."

Awaiting the start of the research meeting are W. A. Herbst and S. H. Hulse, both of Esso Research and Engineering.

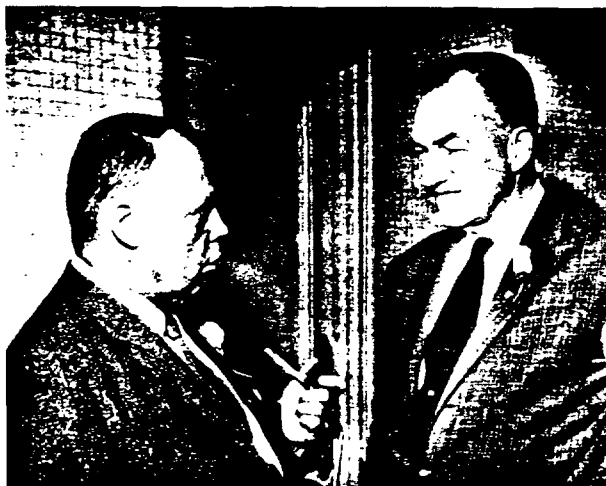


Session speaker L. C. Beard, Jr., Socony Mobil, reviews some research figures at a blackboard.

Cecil E. Boord, of Ohio State University, reports to the Research Project 45 Advisory Committee. At the head of the table is E. C. Hughes, of Standard of Ohio, chairman.



Fundamental Research



Two Pacific coast research men: G. R. Lake, Union Oil, and A. L. Lyman, California Research Corporation president.



Above, Wheeler G. Lovell, Ethyl, examines the certificate of appreciation awarded him by Research Project 45 Advisory Committee.



Left, this friendly threesome includes N. D. Goggeshall, Gulf Research and Development; S. S. Kurtz, Jr., Sun Oil; and Archi Hood, Shell Development.

Glen B. Garipey, Ohio Oil, recorded session highlights on film.



Below, in a session audience are J. C. Schiller and C. R. Hocott, both Humble Oil & Refining.

Transportation

ONE group session and twenty-one committee meetings were held during the 37th annual API gathering to discuss the many diverse problems of transportation that affect oilmen.

Bertram D. Tallamy, federal highway administrator, told the group session that the Federal-aid highway act of 1956 has given cities the greatest opportunity in history to solve their traffic problems.

Professor Harry D. Benford, of the College of Engineering at the University of Michigan, stated that the U. S. Merchant Marine has at least a 10-year wait for its first commercial nuclear ship. Hugh N. Emerson, of The Atlantic Refining Company, also spoke at the group session.



Above, speakers Bertram D. Tallamy, federal highway administrator, and Hugh N. Emerson, of Atlantic Refining.



Left, Frank O. Prior, president of Standard of Indiana and retiring API vice president for Transportation, presided.

Right, Richmond K. Kelly, Tidewater, reported for the Division's Nominating Committee at the session.



Transportation



Left, Charles E. Spahr, president of Standard of Ohio, is the new API Transportation vice president.



Right, group session speaker Harry D. Benford, of the University of Michigan.



Transportation Club officers are Leland C. Davidson, Cities Service, retiring president; Charles H. Wager, Shell, incoming president; James R. Lewallen, vice president of Anderson-Prichard Oil, 1st vice president; William D. Ohle, Sinclair Refining, 2nd vice president; and Raymond R. Hooper, Cities Service, secretary-treasurer.



J. J. Powelson, Esso; Calvin T. Thomas, General Petroleum; and Fred Hague, Sun Oil, at the meeting of the Central Committee on Highway Transportation.

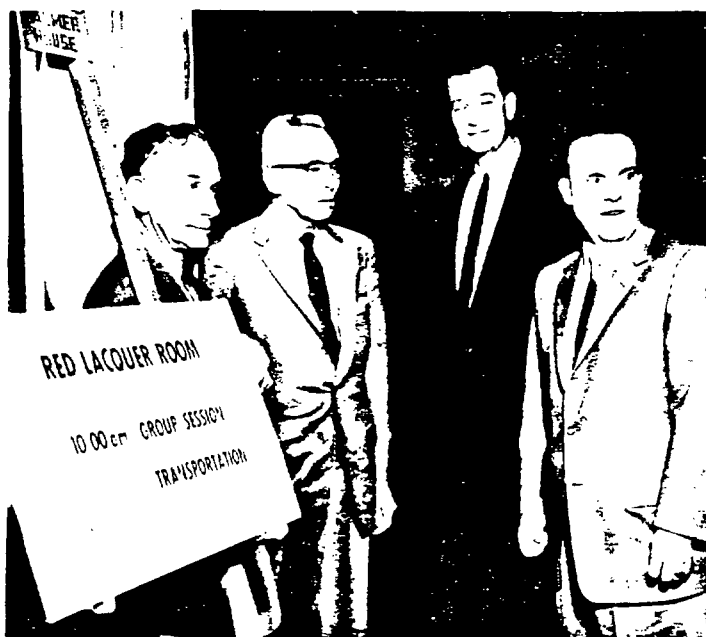
At the Central Committee on Pipeline Transportation meeting are R. K. Paine, Standard of California, and R. H. Lynch, Atlantic Pipe Line vice president, committee chairman.



Receiving certificates of appreciation are P. G. Anderson, Lion Oil; Frank Baird-Smith, Refiners' Transport and Terminal; L. F. Kahle, Standard Oil of New Jersey; F. O. Prior, API vice president, who made the presentations; W. D. Ohle, Sinclair Refining; and E. W. Fiske, Jr., Socony Mobil.



Nisbet G. Miller, of Union Tank Car, speaking; E. E. Wickman, Shell, committee chairman; and R. H. Ewing, Cities Service, at the Railroad Equipment meeting.



Outside the Red Lacquer Room before the group session are Oscar A. Abbey, R. H. Starrett, Norman F. Tietze, and S. A. Hallberg, all of Standard of Indiana.

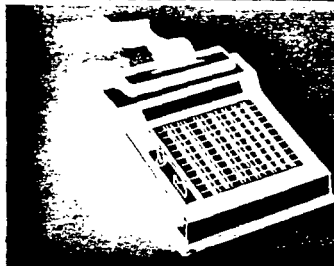


R. K. Paine, California Standard, new Pipe Liners Club president; Oliver Klinger, Jr., Pipe Line News, secretary-treasurer; and the outgoing club president, J. H. Wood, Jr., of Atlantic Pipe Line.

In the group session audience were David Bernstein, Fruehauf Trailer; D. R. Wall, Jr., Magnolia Petroleum; and Julien J. Audette, Kramer Tractor.

R. A. Brannon, Humble Pipe Line; Dean C. Glass, Pure Transportation; and L. S. Wrightsman, Humble, at the Central Committee on Pipeline Transportation.





Finance



"The Business Outlook" was discussed by Marcus Nadler, of New York University's School of Business Administration, at the Monday session.



A. A. Buzzi, of Shell, API vice president for Finance and Accounting, presented a certificate of appreciation to William L. Naylor, Gulf Oil senior vice president.

These oilmen are listening to a report on accounting procedures in the automotive industry.



and Accounting

FINANCE and Accounting activities were characterized by consideration of broad aspects of the division's field, as well as by down-to-earth committee activities.

Although he foresees a temporary continuation of the current plateau in business and industrial activities, Marcus Nadler, of the Graduate School of Business Administration at New York University, discounted the possibility of a serious depression. Another principal group session guest speaker was Richard C. Gerstenberg, General Motors treasurer, who explained how some of his company's intricate data can be simplified on charts and graphs.

Thirty-seven new members of the division's General Committee were elected on Tuesday, representing oil companies in a dozen states from coast to coast.



Richard C. Gerstenberg, General Motors treasurer, was a principal speaker.



Left, P. C. Salman, of Socony Mobil, reported for the Nominating Committee.

Right, Sinclair Refining men attending included J. D. Seifer and E. B. Killick, shown here listening to a speech.



Discussing the program as they left a meeting: William F. Styler, Jr., Crescent Corporation vice president and treasurer; John S. Shaw, Ingalls & Snyder partner; and Charles W. Haynie, of Carl M. Loeb Rhoades & Co.

John H. Schaefer, Ethyl staff vice president, and William R. Perdue, Jr., Ethyl vice president and treasurer, exchange viewpoints with Kenneth M. Burns, Ohio Oil.



Finance and Accounting



Representatives of companies with close corporate ties attending the Finance and Accounting meetings included Bruce C. Cline-smith, Jersey Standard; Bert Edwards, Carter; Frederick P. Hagan, Esso; O. L. Luper, Humble; and A. O. Savage and W. C. Jennings, both of Jersey Standard. All are controllers or assistant controllers of their firms.



A profitable meeting was held by the Corporate Finance Committee, with Alfred E. Wolf, Standard of Ohio vice president, as chairman and R. Paul Henry, D-X Sunray vice president, vice chairman.



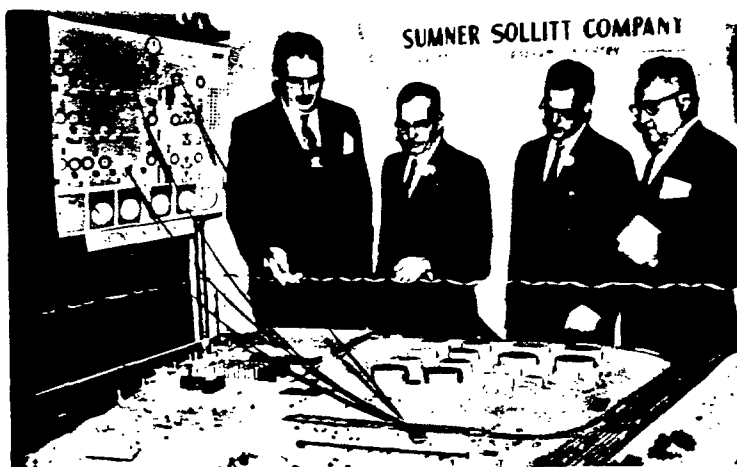
Among those attending Tuesday's group session were Ellis P. Earle, Texas City Refining, and B. Frank Harrison, Jr., of La Gloria Oil & Gas.



Other division meetings were held from Sunday through Tuesday by hard-working groups. The Corporate Accounting Committee is shown here at its session.

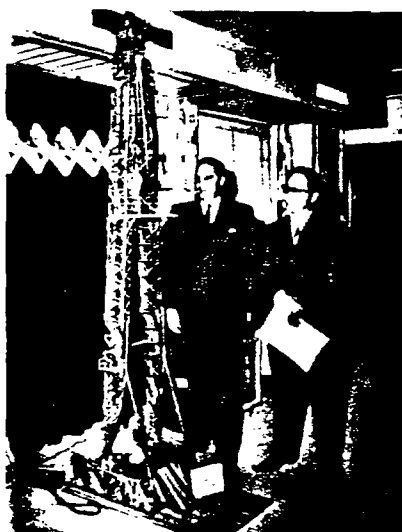


C. W. Rice, El Dorado Refining vice president, and T. B. Murphy, of Western Oil and Fuel, get together for a chat.



Sumner M. Sollitt, Sumner Sollitt Company president, explains a model oil installation to H. J. Voorhies, Esso Standard Oil vice president, and J. P. Warner, also of Esso. At right is A. J. Barth, Sumner Sollitt vice president.

Here and There



A miniature drilling rig interests Julian J. Frey, of Ethyl, and Hideo Matsunaga, of Japan's Maruzen Oil.



G. T. Minogue, American Airlines; R. G. Clark, Utah Oil Refining vice president; and C. O. Anderson, Rock Island Refining, at the home town newspapers table on the Hilton's mezzanine.

Right, Glenn Willis, Clark Oil & Refining; Frank F. Stebbins, Thomson & McKinnon; and Murray Hale and Charles W. Neff, also of Clark Oil & Refining.



Here and There



In this Richfield Oil trio are David E. Day, vice president; Rollin Eckis, executive vice president; and E. M. Benson, Jr.



A close-up of W. K. Whiteford, president of Gulf Oil.



Enjoying a time of relaxation from a busy annual meeting schedule are two oil company vice presidents, W. V. Ischie, of Sinclair Refining, and H. A. Brown, of D-X Sunray.

Left, J. F. Johnson, Jr., of Shell Oil, and L. E. Kincannon, Rock Island Refining executive vice president, in a lobby visit.

At a meeting of the Defense Services Committee: Capt. W. C. Latrobe, consultant; Capt. A. S. Miller, U. S. Navy; Col. A. C. Gilliam, Pipelines Junction Center; Rear Adm. O. P. Lattu, Military Petroleum Supply Agency; and Col. J. R. Maedler, U. S. Army.



R. W. Burns and J. M. Ivy, both of Carter Oil, stop to window shop.

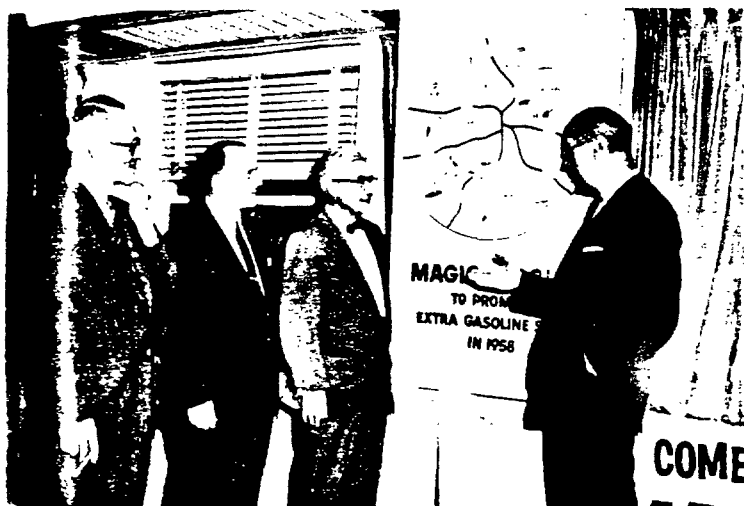


ETC 30740



F. O. Koontz, president of Quaker State Oil Refining.

Right, a candid photo of A. M. Calderone, of Petroleum Specialties, and E. E. Thompson, of Leonard Refineries.



M. P. Murdock, Ethyl Corporation vice president (right), explains an advertising display to C. K. Roof, Pure Oil; Alexis deTarnowsky, Pure Oil; and A. T. Van Pelt, Berry Asphalt vice president.

D. A. Monro, Standard of Indiana; G. M. Brady, American Oil; and M. D. McDorman, Ethyl Corporation, in a hotel corridor.



Below, at the Transportation Club dinner are J. P. Dennis, Texaco; H. B. Brown, Socony Mobil; E. J. Gresslin, Ethyl; and A. G. Anderson, Socony Mobil . . . Below right, at the Marketers' luncheon are J. E. Simonds, Esso Standard; L. C. Welch, Standard of Indiana (retired); E. J. Langham, Sun Oil; and H. L. Porter, Standard of Indiana.





M. S. Hauser, Ohio Oil, and Thomas W. Phelps, Socony Mobil, outgoing and incoming OIC chairmen, respectively, as they were photographed at a committee meeting.



Fred C. Foy, Koppers Company president, spoke at the well-attended group session. The provocative title of his talk was "Sez Who?"



Enjoying a pre-session visit are P. C. Humphrey, of the Oil Information Committee, and Franklyn Waltman, of Sun Oil.

H. S. M. Burns, chairman of the Public Relations Committee of the API board of directors (third from left), presented certificates of appreciation to H. E. Prunty, Standard of Indiana; F. H. Meeder, Richfield Oil of

New York president; E. A. Cunningham, Shell Oil; W. D. Cross, Jr., Sinclair Refining vice president; G. R. Fenner, Pure Oil; J. T. Dickerson, Shell Pipe Line; and R. W. Abrahamson, Continental Oil.



Public Relations

CONSOLIDATION "at the earliest practical date" of the activities of the American Petroleum Industries Committee and the Oil Information Committee into a Public Affairs Committee to report directly to the API board of directors was voted by the board at the annual meeting.

At the Public Relations group session, Fred C. Foy, Koppers Company president, told oilmen that the future of their industry lies in the minds of men. M. S. Hauser, outgoing chairman, reported on OIC activities during 1957 and spoke of the challenges of 1958.



H. S. M. Burns, Shell Oil president, who presided at the group session.



At the luncheon of the Public Relations Committee of the API board were Douglas Campbell, of Pure Oil, and Charles Simons, executive vice president of the Texas Mid-Continent Oil and Gas Association.

Participants in public relations activities included John Driscoll, of Batten, Barton, Durstine and Osborn; Kerry King, The Texas Company; and, in back, Stewart Schackne, Jersey Standard.



In charge of their respective companies' public relations activities are W. R. Huber, Gulf Oil; Harold L. Curtis, Shell Oil vice president; S. Z. Natcher, Standard of California; and Richard Rollins, Atlantic Refining secretary.





Jake L. Hamon, API board chairman; Frank M. Porter, president of the API; and Dr. Warren K. Lewis, professor emeritus at Massachusetts Institute of Technology, as Dr. Lewis received a scroll and API gold medal for his outstanding contributions to the oil industry. Dr. Lewis is known as "the father of modern chemical engineering."



Entering the ballroom for the Wednesday session are Clyde E. Wallingford, executive secretary of Ohio Petroleum Marketers; Addison E. Dewey, executive secretary of the Petroleum Industries Committee of Ohio; Charles H. Miller, Texaco; and Sam Bohlen, owner of Snyder Oil.

Sitting on a table in the rear of the crowded ballroom are Gen. John R. Gilchrist, vice president of Tidewater Oil; John W. Bitner, Empire Trust Company; John F. Campbell, of the API; and Charles D. Signorelli, also of Tidewater.



TWO GENERAL SESSIONS, both held in the large, beautiful Grand Ballroom of the Conrad Hilton, attracted capacity crowds.

The first, which convened on Monday afternoon, featured a talk by API president Frank Porter; presentation of the API gold medal to Dr. Warren K. Lewis, professor emeritus of chemical engineering at Massachusetts Institute of Technology; and

a speech by Sen. Robert S. Kerr, of Oklahoma.

On Wednesday morning, the large audience heard three speakers. They were Charlton H. Lyons, Sr., president of the Mid-Continent Oil and Gas Association; Philip D. Reed, board chairman of General Electric; and Sen. Everett M. Dirksen, of Illinois. Jake L. Hamon, retiring chairman of the API board of directors, presided at both sessions.

General Sessions



Sen. Robert S. Kerr, of Oklahoma, Kerr-McGee Oil Industries board chairman, who spoke at the Monday session.



Photographed before the start of the Wednesday session were B. Brewster Jennings, Socony Mobil board chairman (left background); and T. A. Mangelsdorf, senior vice president, and Michael Halpern, retired senior vice president, both of Texaco.



Two Skelly Oil men in attendance Monday were William P. Whitmore and Claud L. Blacksher.

Below, R. L. Kittle and H. A. Mitchell, both of Shell Chemical, on the balcony at Monday's meeting . . . Right, an announcement poster in the foyer.



General Sessions



Wednesday speakers were Philip D. Reed, General Electric board chairman; Sen. Everett M. Dirksen, of Illinois; and Charlton H. Lyons, Sr., president of the Mid-Continent Oil & Gas Association.



Waiting for the Monday session to begin are Leon W. Okon, and Powell O. Morgan, both of Kerr-McGee Oil Industries.



Arthur J. Daniel, president of Battenfeld Grease & Oil, and Frank Adcox, Lion Oil.

In the Monday audience were R. E. Lee, of Sun Oil, and P. M. Broach, of Suntime Refining.



W. F. Stroud, Atlantic Refining vice president, and S. K. McCauley, of the same company.



Eugene T. Adair, executive vice president, and H. B. Fuqua, president of Texas Pacific Coal & Oil; and Arch H. Rowan, Jr., board chairman of Rowan Oil, at the Monday meeting.



Robert W. Richardson, Ethyl, and C. Willis Stose and W. Aldin Myers, both of Atlantic Refining, in Wednesday's audience.



Part of an overflow audience were John A. Nevison, Atlantic Refining and Roland J. Bennett, of Triangle Refineries.

An overall view of the Monday audience from the balcony.



Board of Directors



API officers for the coming year include Frank M. Porter, re-elected president; H. S. M. Burns, Shell Oil president, new board chairman; and Willard M. Wilson, new secretary.

Chatting at the board meeting Monday evening are Rawls, Pure Oil board chairman; B. Kelly, Pure Oil president; and W. M. Dow, Denver.



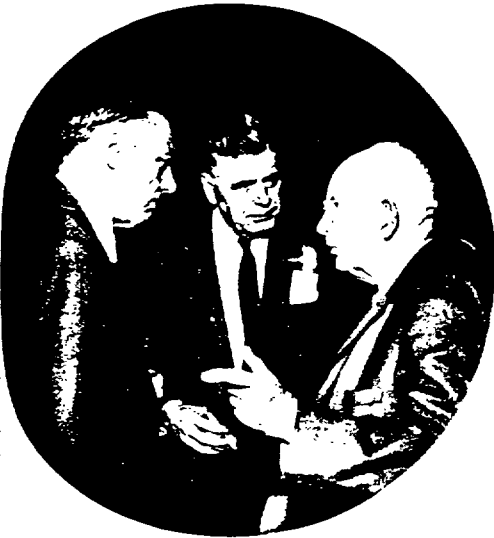
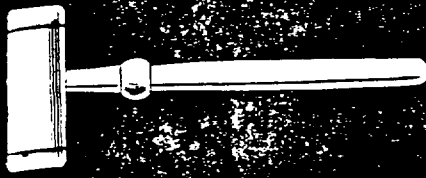
Left, two board chairmen intent in conversation are Alfred Jacobsen, Amerasia Petroleum, and Richard Wagner, Champlin Oil & Refining.



Right, Clyde T. Foster, Standard of Ohio board chairman, listens closely as Paul Endacott, Phillips Petroleum president, makes a point.

Photographed at a board luncheon were Joseph N. Pew, Sun Oil board chairman; Jake L. Hamon, outgoing API board chairman; and H. L. Hunt, Hunt Oil president.





THE board of directors met several times during the annual meeting to conduct the Institute's affairs. H. S. M. Burns, president of Shell Oil, was elected chairman of the board, succeeding Jake L. Hamon, an independent producer who had served for two years. Frank M. Porter, president of Fair-Porter Drilling Company, was re-elected president, and B. Brewster Jennings, Socony Mobil board chairman, was re-elected treasurer. Willard M. Wilson, assistant director of APIC, was elected API secretary, succeeding Lacey Walker who retired earlier in the year. Charles E. Spahr, Standard Oil of Ohio president, was elected API vice president for Transportation, succeeding Frank O. Prior, Standard of Indiana president. API vice presidents re-elected were: D. L. Connelly, Warren Petroleum vice president (Production); H. W. Ferguson, Humble Oil & Refining vice president (Refining); and Dwight T. Colley, Atlantic Refining vice president (Marketing).



Left, on hand from New York for the annual meeting were J. J. Cosgrove, Continental Oil board chairman, and J. W. Foley, Texaco president.



Right, awaiting the start of a meeting are Gage Lund, Standard of California vice president, and M. H. Robineau, Frontier Refining president.

Stanton K. Smith, Smith Oil president; Edward L. Shea, Ethyl Corporation board chairman; and L. F. McCollum, Continental Oil president, make up this luncheon threesome.



R. L. Minckler, General Petroleum president; R. S. Blazer, Ashland Oil board chairman; and J. C. Donnell II, Ohio Oil president.





John Harper, Harper Oil president, studies annual meeting literature.



A. A. Stambaugh, retired Standard of Ohio board chairman.



Dean A. McGee, president of Kerr-McGee Oil Industries.

Samuel H. Elliott, vice president of Standard of Ohio.



Board of Directors

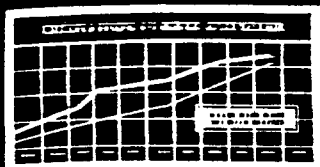


J. L. Burke, Service Pipe Line president, and David V. Stroop, of the API, presided at the board of councilors meeting in the Conrad Hilton's Waldorf Room.



Members of the board of councilors, meeting to select nominees for membership on the API board of directors, included, above, George A. Davidson, Standard of California vice president; H. Y. Hyde, Tidewater Oil vice president; and K. E. Kingman, Union Oil vice president; and, below, L. R. Forker, Quaker State executive vice president; R. W. Grunert, South Penn Oil senior vice president; and J. H. Durbin, Barber Oil president.





Statistics

THE Statistics group session, held on Wednesday afternoon in the Hilton's Waldorf Room, featured three speakers. Martin R. Gainsbrugh, chief economist of National Industrial Conference Board, talked on "The Emerging Economic Outlook for 1958." Albert J. McIntosh, economics consultant for Socony Mobil, spoke on "Petroleum Demand—Past and Future." Serge J. Jurenev, chief economist for Continental Oil, talked on "The Functions of an Economist in an Oil Company."

Martin R. Gainsbrugh, National Industrial Conference Board speaker.



Right, Serge B. Jurenev, Continental Oil, at the speaker's podium.



Henri Schwall, Shell Oil, received a certificate of appreciation.



Albert J. McIntosh, Socony Mobil, speaker and former committee chairman, received a special award of appreciation. Maynard I. Landa, Cities Service, present committee chairman, did the honors.





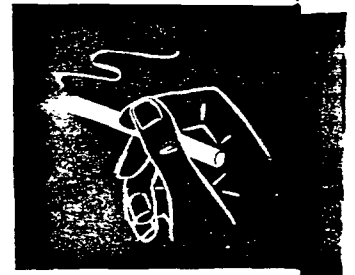
R. A. Martin, Ohio Standard, and Neale Boyd, secretary-treasurer of Anderson-Prichard Oil, were among guests attending the Dresser industries luncheon.



Robert E. Eustice, of El Dorado Refining, and Quentin R. Hagstrom, president of Chicago's General Petroleum, enjoying an informal interlude in the Hilton lobby.



L. L. Huxtable, of Ethyl, with Charles W. Else and Michael E. Moore, both of The Southland Company, and D. M. Krausse, Casden Petroleum vice president.



Veteran oilmen attended the 25 Year Club's annual dinner. They elected John R. Suman, retired Standard of Jersey vice president and director, club president.





Left, two vice presidents, Howard G. Vesper, Standard of California, and B. L. Ray, Esso Standard Oil . . . Right, Jack Sutton and Lacey Walker, API staffers who helped make the meeting successful.



Karl W. Shimeall, vice president of Crown Central Petroleum, pauses for refreshment in his hotel's drugstore.

Between the Acts



A Carter Oil threesome, C. D. Hill, A. F. Maxson and W. W. Bryan, vice president, photographed in a hotel corridor early Tuesday evening.



J. B. Rogerson, Lion Oil vice president, and John T. Cochran, Jr., independent, used the Hilton's theater ticket desk for a rendezvous point between sessions.



An off-duty interlude for Rea R. Jackson and T. P. Simpson, both of Socony Mobil.





Randolph H. Deer, Bonded Oil vice president, uses a bottle of motor oil to illustrate a point.

S. C. Bartlett, a Texaco vice president, and J. B. Fisher, president of Kendall Refining, in the audience at Tuesday afternoon's group session.



A. L. Wiest, Shell Oil, and Stanley P. Gildersleeve, vice president of Penola Oil, in a pre-session huddle.

Right, a cameraman's view of the large turnout for the Tuesday session in the Florentine Room at the Congress.



Dwight T. Colley, Atlantic Refining vice president, who presided at Tuesday's group session, with certificate of appreciation recipients L. T. White, vice president of Cities Service Petroleum; C. Z. Hardwick, executive vice president of Ohio Oil; and W. C. Burns, president of the Hartol Petroleum Corporation.



Above left, John A. Torode, of Torode Oil, speaking Wednesday . . . Right, H. L. Mair, of Pure Oil, gave the Nominating Committee report.



Rudolph Cubicciotti, National Lubricating Grease Institute president, who showed the Institute's latest film, and Fred E. Rosenstiehl, of Texaco, chairman of the API Lubrication Committee.

Marketing

THE many problems confronting marketers for the coming year were discussed at two group sessions and numerous committee meetings and luncheons during the annual meeting.

John A. Torode, of the Torode Oil Company, said that a jobber should be vitally interested in the motor oil market because he makes a good profit from the sale of motor oil. Randolph H. Deer, vice president of the Bonded Oil Company, suggested that the motoring customer be better educated on the importance of oil change and the right type of oil for his car.

Dwight T. Colley, API vice president for marketing and vice president of Atlantic Refining, presided at the Tuesday session. F. E. Rosenstiehl, Texaco, presided Wednesday.



Martin H. Hassold with vice president Dwight F. Benton, both Standard of Indiana, at the Jobber Advisory Committee meeting. Mr. Benton presided.

Vice presidents Frank R. Markley, Sun Oil, and L. W. Sweet, Pure Oil, at the oil marketers' luncheon on Tuesday.



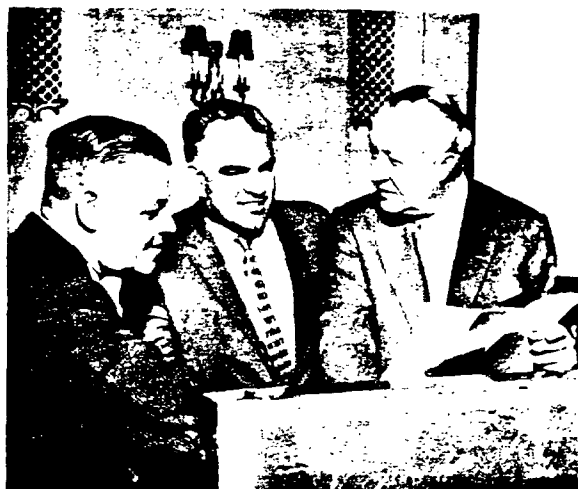
The Marketing Division Membership Committee held a luncheon on Monday. Everett F. Wells, president of Ashland Oil, seated at the head of the table on the right, was committee chairman.



Marketing



At the Jobber Advisory Committee meeting were J. A. Miller and E. B. Paust, both of Esso; E. E. Wall, vice president of California Oil; and R. H. Scholl, Esso vice president.



At the Aviation Technical Service Committee meeting were E. Earl Lothrop, API; Lawrence J. Grunder, Richfield Oil; and Aubrey Keif, Texaco, chairman of the committee.



Howard Cuyler, Standard of California; C. J. Guzzo, Gulf Oil vice president; and W. P. Marquam, of Pure Oil, at a committee gathering.



Two company presidents at the Tuesday session were Robert M. Jenney, Jenney Oil, and R. J. Hull, Cities Service of Canada.

Right, Harold K. Apel and Gerald T. Dougherty, both of Standard of Indiana; Allan J. Welliver, Sun Oil; and G. Harold Osborne, Kendall Refining vice president and incoming chairman of the Lubrication Committee.



Production

TOPICS including industry investments abroad, taxes, oil imports, the importance of domestic reserves to national defense and personnel problems linked with mechanization were covered by six principal speakers at Production sessions. Candidates for the division's general committee were elected, and outstanding Production men received certificates of appreciation. Members of 20 committees tackled a variety of basic subjects during morning, afternoon and all-day meetings.



D. L. Connelly, API vice president for Production, presided Tuesday.



Above, Wilfred H. Geis, geologist and petroleum engineer, and, below, Lt. Gen. E. O. Thompson, Texas Railroad Commission, both Production speakers.



A. L. Nickerson, president of Socony Mobil, speaking on "An American Oilman Looks Abroad" before Wednesday's capacity audience. Harold Denton (right), Sun Oil, presided.

Herbert W. Ladd, of Pan American Petroleum, presiding at a busy meeting of the Central Committee on Standardization of Oil Field Equipment on Wednesday morning.



Production



With S. C. Oliphant, Tennessee Gas Transmission vice president, presiding, an address is given by Kenneth Curtis, Industrial Relations Counselors Service.

Right, this trio included Blaine B. Wescott, Gulf Research and Development executive vice president; Roy A. Fletcher, British Petroleum; and J. D. Sterling, Sunset International Petroleum president.



Key Production speakers included Capt. Matthew V. Carson, Jr., U.S.N., administrator of the voluntary oil import program, Department of the Interior.



Before the start of Wednesday's session in the Hilton's Grand Ballroom, Lysle R. Kirk, Ohio Fuel Gas, and DeWitt T. Ring, Waverly Oil director, exchanged views.



William J. Gerwe, Socony Mobil, and H. Malcolm Clark, president of Clark Oil of Crown Point, Ind., read news of meeting progress.





The caliber of principal addresses is shown by the attentive interest of E. E. Tucker, Tidewater, and R. F. Ladd, vice president of Milwhite Mud Sales.



Burton W. Whiteley and R. W. Edmund, both of Sohio, were among Production men interested in ample published material available.



The nominating committee reported via Reid Bond, chairman, a new Shell vice president.

The Steering Committee on Educational Guidance; Arthur Joens, Humble, chairman.



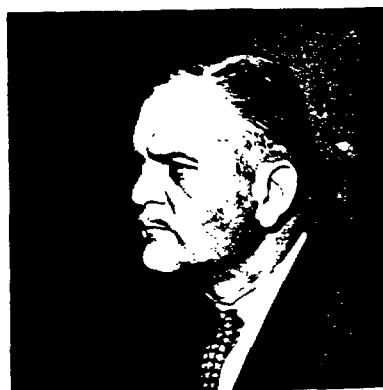
Certificates of appreciation were awarded to these seven Production men by D. L. Connelly, API vice president (left): L. E. Fitzjarrald, Phillips; John G. Pew, Sun; R. O. Garrett, Texas Gas Exploration; R. G. Strong, Natural Gas Pipeline of America; J. E. Toussaint, Standard of California; H. H. Kaveler, consultant; and John E. Sherborne, Union Oil.



Refining

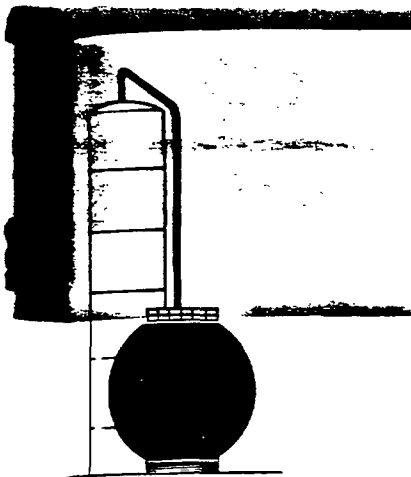


Speakers on the group session program were (standing) D. T. Rogers, Esso Research and Engineering; J. J. Conradi, Shell Oil; A. Klinkenberg, N. V. De Bataafsche Petroleum Maatschappij; and (seated) C. E. Schleckser, Jr., Esso Research and Engineering; H. W. Field, Atlantic Refining vice president; and H. W. Ferguson, Humble Oil & Refining vice president and API vice president for Refining.



Among those in the session audience were, above, E. B. McConnell, Standard of Ohio vice president; J. H. McClintock, Esso; and, below, J. W. Newton, Norvell Wilder Supply; and R. J. Askevold, Pure Oil.





At the head table at a meeting of the Automotive Research Committee are W. T. Gunn, of the API, and W. J. Sweeney, Esso Research and Engineering vice president, the committee chairman.

THE occurrence, reduction and prevention of static electricity in petroleum products and petroleum facilities was discussed by four speakers at the Refining group session held Tuesday morning. Their papers represent extensive studies carried out by several companies which have felt the need for more information on the subject. There is no simple solution to the problem, it was pointed out, but eventually, it is anticipated, continued research will yield facts that will fit into a pattern of value to the industry.



J. C. Ducommun, of Standard of Indiana, presides at a meeting of the Refining Executive Committee.



W. W. Scheumann, Cities Service Research and Development vice president, lights a smoke before a meeting.

Right, the Smoke and Fumes Committee at its Monday morning gathering.





Edmund P. Learned addressed the session and William F. Kenney, Shell Oil vice president, presided.



Presidents Frank H. Dunn, of Wilcox Oil, and Harry E. Milton, of Milton Oil, study an APIC poster.



Richard S. Crog, Union Oil, and Fred M. Elliott, Wisconsin Petroleum Industries Committee, executive secretary.



Miller W. Conn and J. A. Young, Phillips Petroleum, and George H. Colin and Gentry Lee, Cities Service, formed part of the large audience.

Right, an overall view of the many persons who attended the APIC meeting.





Electronic computing equipment was among exhibits of interest to Pure Oil's D. S. Frank and Charles A. Porter. The machine's operations are being explained by J. D. Kennedy, Electronic Associates representative.

Candid



B. R. Dorsey, of Gulf Oil, on his way to a meeting in the Conrad Hilton.



It was "time out" during a busy afternoon for C. K. Viland, of Tidewater, and M. F. Weill, of Ethyl, on the mezzanine.



An informal close-up of M. J. Rathbone, Standard of Jersey president.

Robert C. Low, Delhi-Taylor Oil, and E. Carl Mattern, a director of the Oil, Chemical and Atomic Workers' Union, picking up copies of speeches given at various meetings.

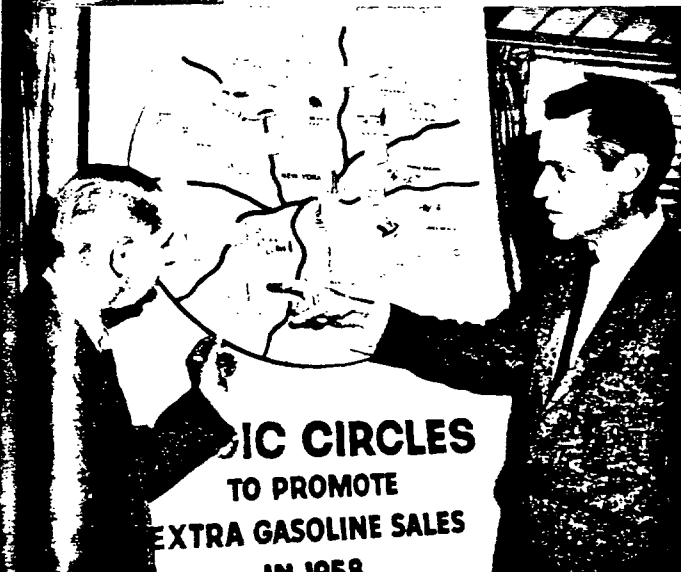


Max E. James, Midland Cooperatives, and James P. Finn, of Premier Oil Refining, at the Transportation Club dinner.

Camera



Right, two Tidewater men, Arthur W. John and Russell D. Richardson, treasurer, taking a close look at a mannequin artist's work.



Elmo K. Ballard, Triangle Refineries, and Bruce Crane, of Ethyl, study aspects of "Magic Circle" advertisements, which Ethyl is using to promote more driving and increased gasoline sales during 1958.



W. T. Leeper, Bayou State Oil vice president, at Standard of Jersey's 75th anniversary party, meets Eugene Holman, board chairman.

Harold T. Meeker, of Illinois Farm Supply, and Mrs. Meeker, with A. R. Ayers, also of Illinois Farm Supply, found time for relaxation after busy days attending meetings.



Three vice-presidents enjoying the Pipe Liners' reception are E. L. Hiatt, Union Oil; Frank Havens, Platte Pipe Line; and George H. Supple, General Petroleum.



Candid Camera



On their way to a meeting are S. T. Pruitt, Ethyl, and Ralph Booker, executive vice president of the National Cooperative Refinery Association.



James E. Boudreau, Ethyl; and T. Elwood Webster and Alan T. Knight, president and executive vice president, respectively, of Catalytic Construction.



Many men like M. B. Fisher, of Koch Engineering, and Theodore C. Banta, Sinclair Oil vice president, met old friends and made new ones.



Representatives of state farm bureaus and cooperatives found much of common interest to discuss. Among them were Charles H. Ruoff, Jr., Pennsylvania Farm Bureau; Albert L. Russell, Indiana Farm Bureau; G. E. Castree, United Cooperatives; R. G. Roop, Southern States Cooperative; P. R. Burke, United Cooperatives; and C. George Krieger, Ethyl Corporation.



Buyers

FOUR papers were delivered at the meeting of the Petroleum Industry Buyers on Tuesday afternoon in the Beverly Room of the Hilton. Thomas W. Phelps, assistant to the chairman, Socony Mobil Oil, spoke on "The Oil Industry's Challenge for Action." F. M. Mayer, president of Continental-Emsco, talked on "Mutual Problems of Purchasers and Sellers." Reese Taylor, board chairman of Union Oil, spoke on "The New Congress and the Oil Industry." Henry J. Wallace, of National Tube, gave a "Brief Résumé of the Tubular Goods Situation." Charles S. Perkins of Union Oil, presided at the meeting.



Speakers Reese H. Taylor, Union Oil board chairman; Henry J. Wallace, National Tube; Thomas W. Phelps, Socony Mobil; and committee chairman Charles S. Perkins, Union Oil.



Fred M. Mayer, Continental-Emsco president, was also one of the speakers.

The Buyers meeting attracted a large audience as this picture graphically shows.





J. Richard Shaner, API publicity director, supplies Harry Heinecke, Fort Worth Star Telegram oil editor, with data for an article about the meeting.



WORKING IN THE API press room, at committee, group and general sessions, and in lobbies, corridors and private rooms, members of the oil and general press did their usual outstanding job of reporting on the annual meeting. Thousands of words were written for daily, weekly and monthly newspapers and magazines, and outstanding personalities at the conclave were presented on radio and television. To all corners of the United States and to other countries, word of what industry representatives were hearing, saying and doing in Chicago went out by virtually all modern media.



In this lobby twosome are J. B. Woods, of The Petroleum Engineer, and R. E. Elmore, Mid-Continent Supply.



Russell R. Palmer, Petroleum World editor, talks shop with Brad Mills, executive vice president of the American Association of Oilwell Drilling Contractors.



Listening attentively to a Statistics session speaker are Wanda Jablonski, of Petroleum Week, and S. A. Swensrud, former chairman of the Gulf Oil board of directors.



Oscar B. Irizarry, editor of Petroleo Interamericano, who spoke at the annual dinner meeting of the Association of Petroleum Writers.

Meet the Press

Officers of the Association of Petroleum Writers for the coming year are Riley W. Wilson, *Tulsa Daily World*, re-elected secretary-treasurer; Robert E. Spann, *Petroleum Week*, vice president; Frank O. Hall, *Wichita Falls Times*, chairman of the executive committee; and Tom Dougherty, *Petroleum Information*, president.



Arnold Daum, of the petroleum history project at Northwestern University, and Frank Breese, *National Petroleum News* editor, renew their acquaintanceship.



Discussing plans for their publication's coverage of the annual meeting are Henry D. Ralph and P. C. Lauinger, publisher, of *The Oil and Gas Journal*.



Left, C. L. Cooper, *Mid-West Oil Register* publisher, at a buffet.



Right, Keith Fanshier, publisher, and L. D. McGuan, both of *The Oil Daily*, flank J. W. Lenon, of the OIC.



Meet the Press

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Officers of the Association of Petroleum Writers for the coming year are Riley W. Wilson, *Tulsa Daily World*, re-elected secretary-treasurer; Robert E. Spann, *Petroleum Week*, vice president; Frank O. Hall, *Wichita Falls Times*, chairman of the executive committee; and Tom Dougherty, *Petroleum Information*, president.



editor, talks
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Contractors.



Arnold Daum, of the petroleum history project at Northwestern University, and Frank Breese, *National Petroleum News* editor, renew their acquaintanceship.



Discussing plans for their publication's coverage of the annual meeting are Henry D. Ralph and P. C. Lauinger, publisher, of *The Oil and Gas Journal*.



Left, C. L. Cooper, *Mid-West Oil Register* publisher, at a buffet.

Right, Keith Fanshier, publisher, and L. D. McGuan, both of *The Oil Daily*, flank J. W. Lenon, of the OIC.





Meeting in the Congress' Florentine Room, was the Jobber Advisory Committee.



At the Smoke and Fumes Committee meeting on Monday morning were William H. Claussen, California Research Corporation; Carman C. Tate, Phillips Petroleum, who presided; Charles A. Jones, Shell Oil; and Jerry McAfee, Gulf Oil vice president.



Above, J. E. Buchanan, Aspha Institute president, addressing the Asphalt Committee . . . Below, R. G. Folis, Standard California board chairman, presents a certificate of appreciation for safety work to H. V. Boggess, Sinclair Oil and Gas.



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Participating in the Central Committee on Pipeline Transportation meeting were D. F. Sears, Shell Pipe Line vice president, and J. W. Emison, Texas Pipe Line president.



AMONG THE LEAST PUBLICIZED yet most productive of the scores of annual meeting gatherings are the committee meetings. Beginning four days before the start of group and general sessions and continuing a day after, these smaller units assembled in work sessions. Marketing, Production, Refining,

Transportation, Finance and Accounting and non-divisional committees, covering everything from oil-field equipment to marketing practices and corporate finances, convened. Made up of representatives of competing companies, they worked together for the benefit of the public and the entire industry.

Committees



Guy Waddington, National Academy of Sciences, who received a certificate of appreciation for research work, and Harry Levin, of The Texas Company.



Interested in the Central Committee on Highway Transportation are W. O. Brubaker, of the API; H. D. Carmichael, Standard of Kentucky; and C. E. Jackson, D-X Sunray.

Carl E. Cummings, Texaco; Paul G. Benedum, Hiawatha Oil & Gas president and meeting chairman; and H. S. Merriman, Socony Mobil, at the Defense Services Committee gathering.



G. B. Black, Sun Oil; A. F. Hans, Standard of Indiana; and J. C. Wilson, Ashland Oil, concentrate on Traffic Safety Committee work.



ETC 30771

ETING

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ETC 30772

Committees



Enjoying the luncheon of the Marketing Meeting Assistance Committee: T. A. Aldridge, American Oil vice president; L. R. Kamperman, Leonard Refineries vice president; N. T. Stover, Ohio Oil vice president; J. B. Saunders, Kerr-McGee Oil Industries senior vice president; and H. G. Donovan, Globe Oil & Refining vice president.



Edward Keightley, Union Oil of California, presiding at a meeting of the Aviation Advisory Committee.



The Division of Refining Advisory Committee, was chairmanned by Clarence H. Thayer, Sun Oil vice president.



J. E. Hill, Union Oil of California, at the podium at the Committee on Fire Protection Engineering meeting.

An overall view of the Aviation Technical Service Committee at luncheon.



The "History of Petroleum Engineering" editorial board convened Monday with D. V. Carter, Magnolia Petroleum, presiding.

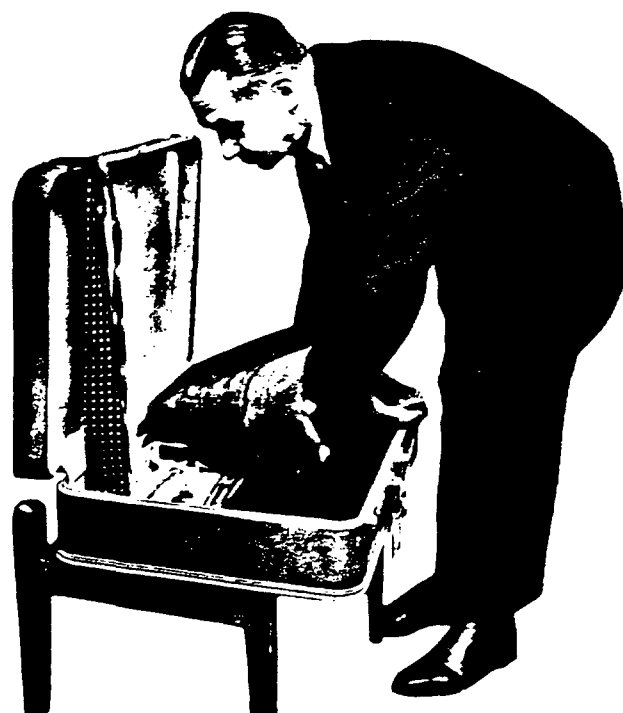


1957 NOVEMBER 1957						
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The Windup

FOR MOST OILMEN, Wednesday, Nov. 13, was the last day of the meeting, although some business was transacted on Thursday. As they came—by air, rail, automobile—so they left Chicago for the short, or long, trip home. One thing all shared was the rewarding experience of having attended the 37th annual meeting of the American Petroleum Institute. Each departing oilman carried with him memories of informative fruitful sessions and of profitable time spent with leading representatives of a progressive industry.

Floyd L. Miller, of Esso Research and Engineering, packs his bags for the journey home.



Two sales managers preparing to leave the Hilton are Salem A. Hart, Jr., of Standard of Ohio, and Charles E. Gore, of Battenfeld Grease & Oil.



E. F. Shannon, of Continental Oil, boards the bus for the ride to Midway airport.

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The Windup



Paying his hotel bill at the end of his stay at the meeting is Robert O. Wilson, of Cosden Petroleum, retiring board chairman of the Asphalt Institute.



Bidding each other farewell until next year are Bernard W. Winters, Southeastern Pipe Line vice president, and Paul R. Jones, of Pure Oil.

Right, leaving for the airport is Nelson Friz, of Esso Standard Oil Company.

UNITED AIR LINES
ASTERN AIR LINE



Ray J. Connor, of Gulf Oil, checks up on homeward bound flights at the Hilton's airline office.

Left, also reserving plane seats, are John F. Lynch, La Gloria Oil and Gas president and an API director, with H. W. Bass, president of the H. W. Bass and Sons Oil Company.



Ray L. Carter, Allied Oil, sending a wire to Cleveland about return plans.



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As he waves good-bye to this year's annual meeting, Joseph Shoaf, of Petrocarbon Chemicals, in company with thousands of other oilmen, looks forward to the . . .

38th Annual Meeting
American Petroleum Institute
Chicago, Nov. 10-13, 1958

ETC 30776