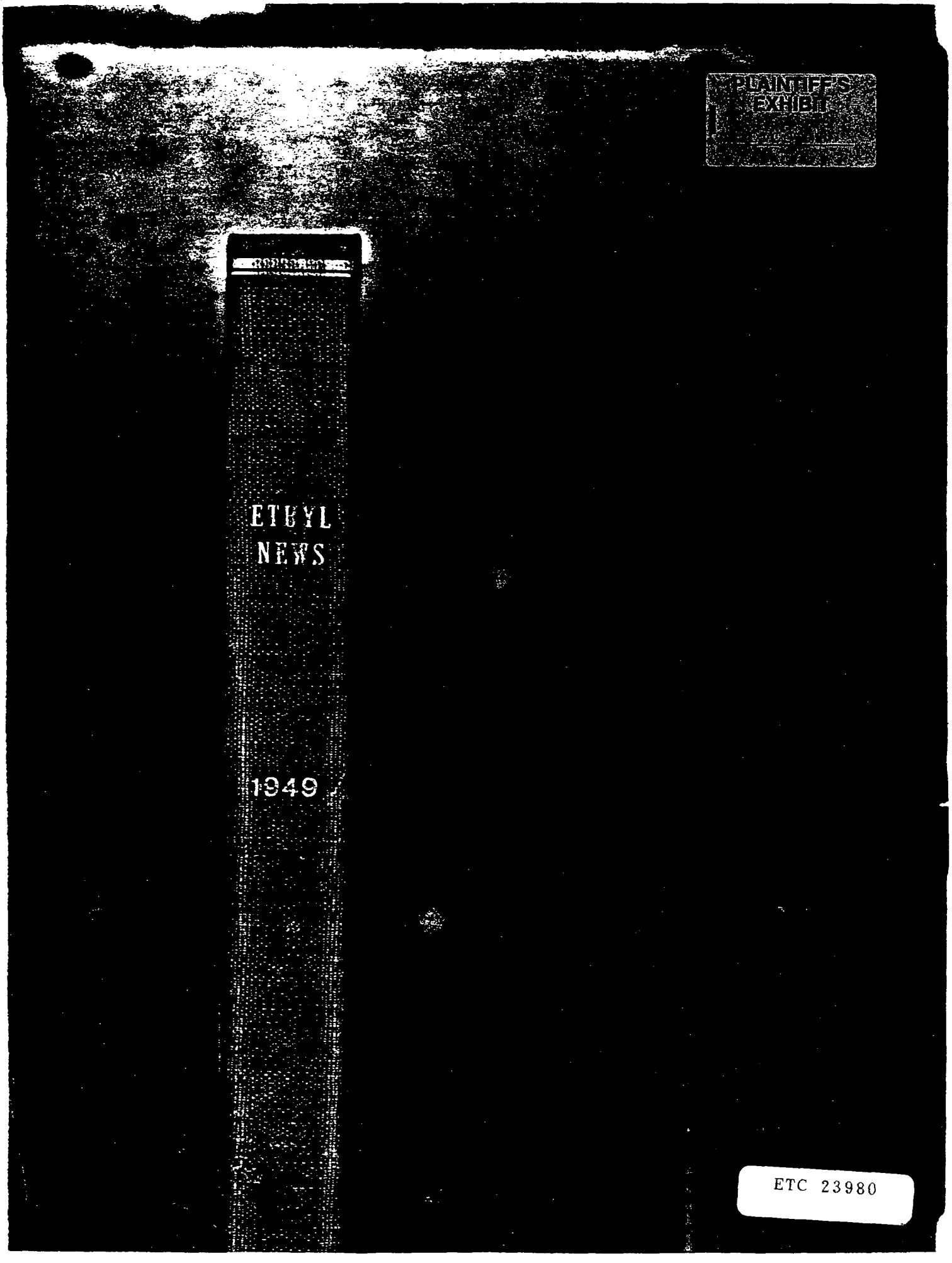
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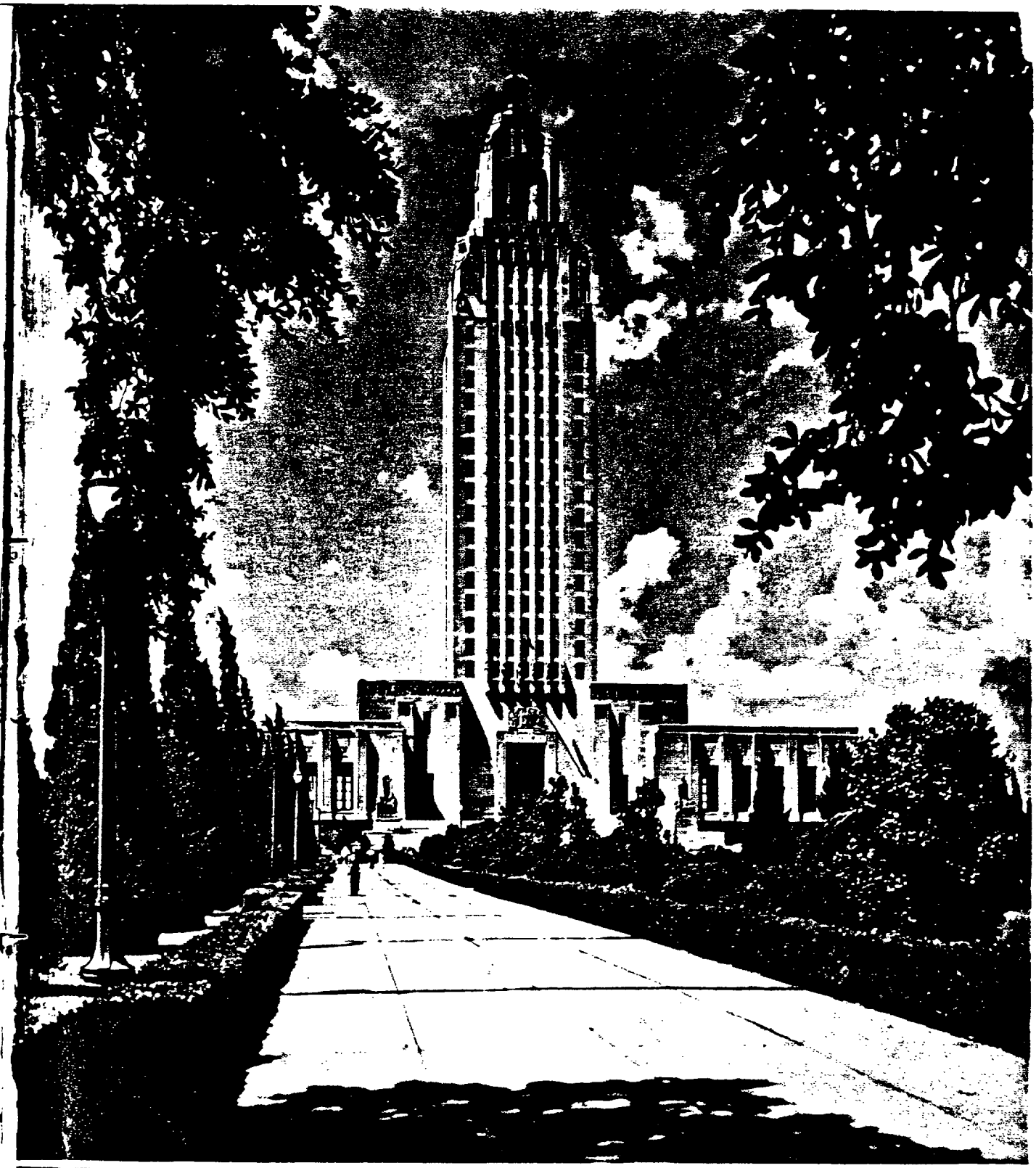

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IN THE

ETHYL NEWS

JANUARY 1949

Harry Kuhe has been named to the newly-created post of manager of chemical sales for Ethyl Corporation. Chief among the Ethyl products he will sell in 1949 is salt cake (Na_2SO_4), which is used in large quantities by the kraft paper industry (see Page 19).

Mr. Kuhe has been associated with Ethyl Corporation since 1929, when he joined the Company as a field representative in Chicago. Three years later he became assistant manager of the former Tulsa Division. He remained in Tulsa for eight years except for a year-and-a-half when he served on a special assignment and as a sales representative in Mexico. In 1940 he went to Seattle as division manager, and six years later was transferred to Chicago as division manager. When the Sales Department was reorganized more than a year ago on a regional basis, he was appointed operations manager of the Central region.

Mr. Kuhe is a graduate of the University of Wisconsin with a B.S. in chemical engineering and a member of the Society of Automotive Engineers. After a year's study and travel in Europe he was associated with Strom Ball Bearing Company in Chicago and Continental Paper and Bag Company in Oconto Falls, Wisconsin, before coming to Ethyl.

As operations manager of the Central region, Mr. Kuhe has been succeeded by Leonard L. Huxtable.

THE "NEW" ETHYL PLANT TAKES SHAPE 3

With some new facilities already beginning to show, Ethyl expects major strides to be taken in 1949 toward completion of its $40 million expansion program at Baton Rouge. Ultimately, a 40% increase in rated capacity for producing "Ethyl" antiknock fluid will be available for customer companies.

THE PRESIDENT TAKES OFFICE 8

A Presidential inauguration is usually a lavish affair, filled with ritual established by tradition. History, however, has provided some startling contrasts and surprises.

PRIME MOVER 12

Although Moving Day still holds terrors for the average American family, the motor truck and modern moving methods have truly revolutionized the bothersome chore. Here's a behind-the-scenes story on how it's done.

PRESENTING: THE FIRE POWER SHOW 16

A new Ethyl presentation, prepared for people in the marketing branch of the oil industry, dramatizes the safe handling of gasoline around service stations and bulk plants.

ETHYL SERVES THE PAPER INDUSTRY 19

Salt cake, which plays an important role in making kraft paper, is a byproduct of Ethyl's manufacturing operations. Beginning this month, sales of salt cake will be handled by a newly-formed Chemical Sales Division.

ALCOHOLISM, A PROBLEM FOR INDUSTRY 22

Excessive drinking is not only a social problem — but an industrial one as well. Here's the modern way in which a growing number of business firms are tackling that problem.

In order to widen the fields of reader interest in Ethyl News, we frequently publish articles contributed by writers not associated with Ethyl Corporation. Opinions expressed in signed articles are the authors'. The editors of the News welcome articles of timely interest submitted from outside sources.

Published by ETHYL CORPORATION, 405 Lexington Avenue, New York 17, N.Y.

Manufacturer of "Ethyl" antiknock compound, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, secretary

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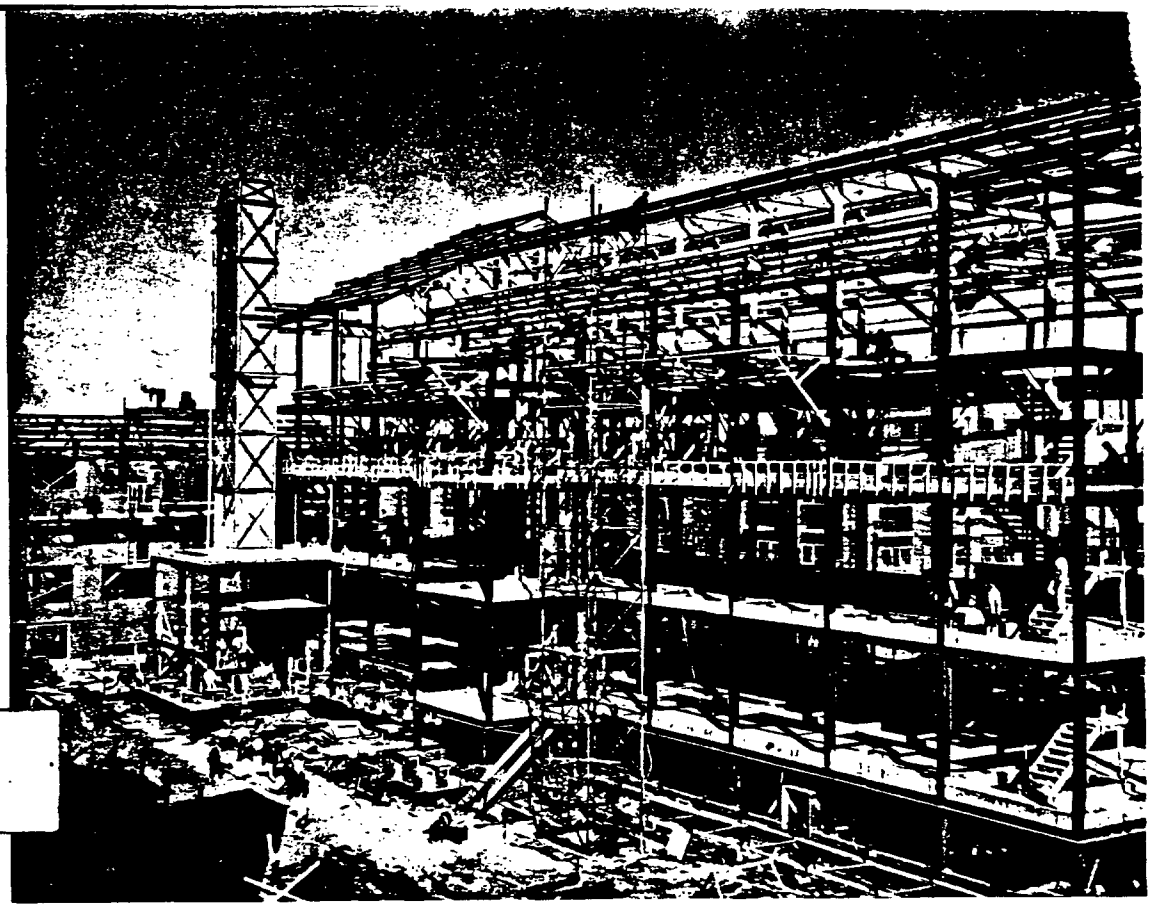

Work is progressing rapidly on this sixth tetraethyl lead unit

THE "NEW" ETHYL PLANT TAKES SHAPE

Great strides toward completion of Ethyl's expansion program are expected this year, with some new units already well along

LOOKING AHEAD to new construction milestones in 1949, Ethyl Corporation expects that the new year will see major strides toward completing its $40 million program for expanding its antiknock compound plant in Baton Rouge, La. By the end of the year, a part of what will ultimately be a 40% increase in the plant's production will be available for customer companies.

The expansion as a whole is being pushed ahead on a number of fronts, with the entire initial program nearly 30% complete. Some units are already finished or nearly so. Others will be ready by Spring. Larger and more complex installations will be in operation towards the end of Summer. Most remaining parts are scheduled for completion later in the year. An "additional addition" in the tetraethyl lead area — a seventh new building — will be started soon, and is expected to be finished in the latter part of 1950.

Ethyl's investment in the expansion program is the largest single expenditure to be made by the company for manufacturing since the plant was first built. It is being carried out in the light of industry forecasts of continuing increases in American production of oil over the next five years, and in accordance with the nation's need for additional quantities of regular grade and premium gasoline containing "Ethyl" antiknock fluid.

The plant, however, has made the fullest possible use of existing manufacturing equipment and know-how to meet heavy post-war demands for

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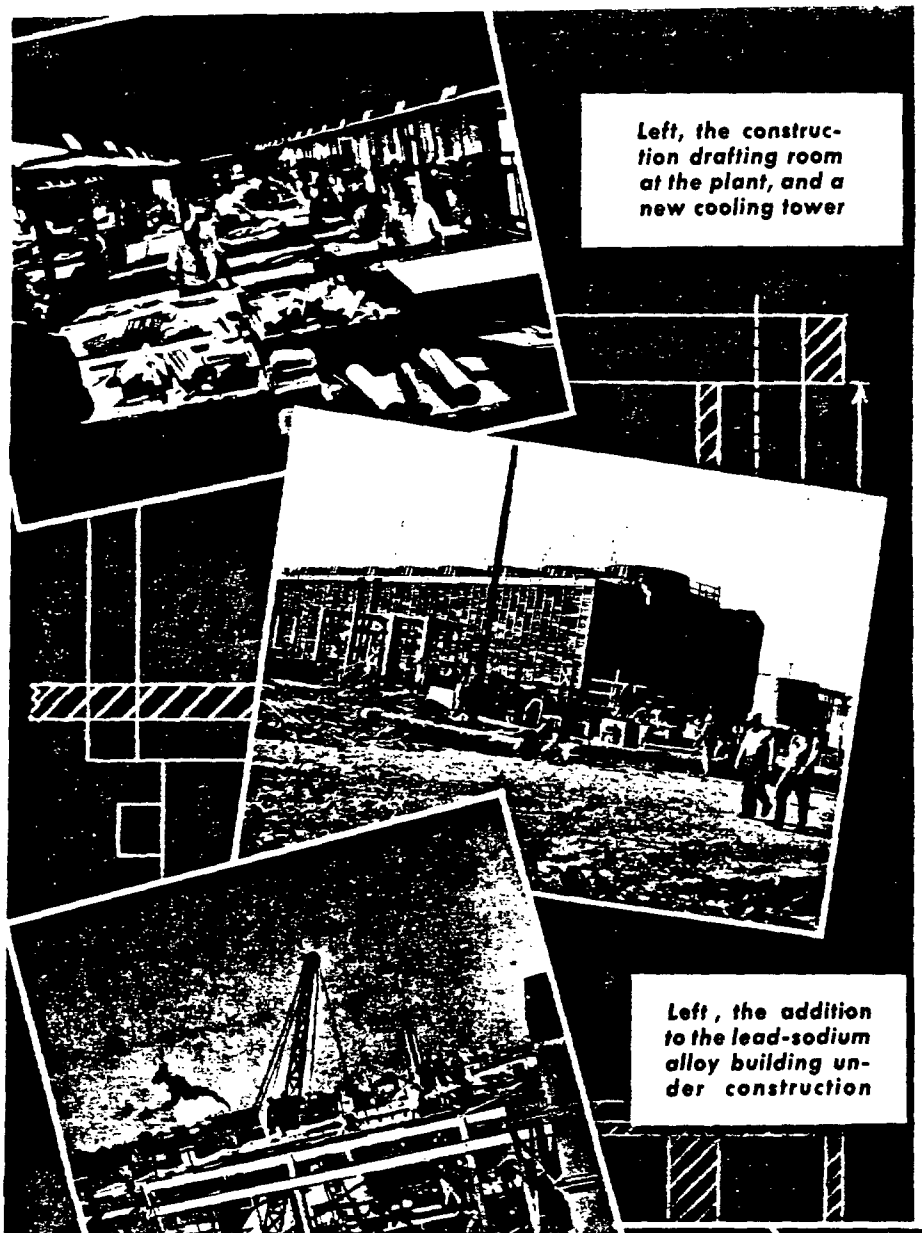
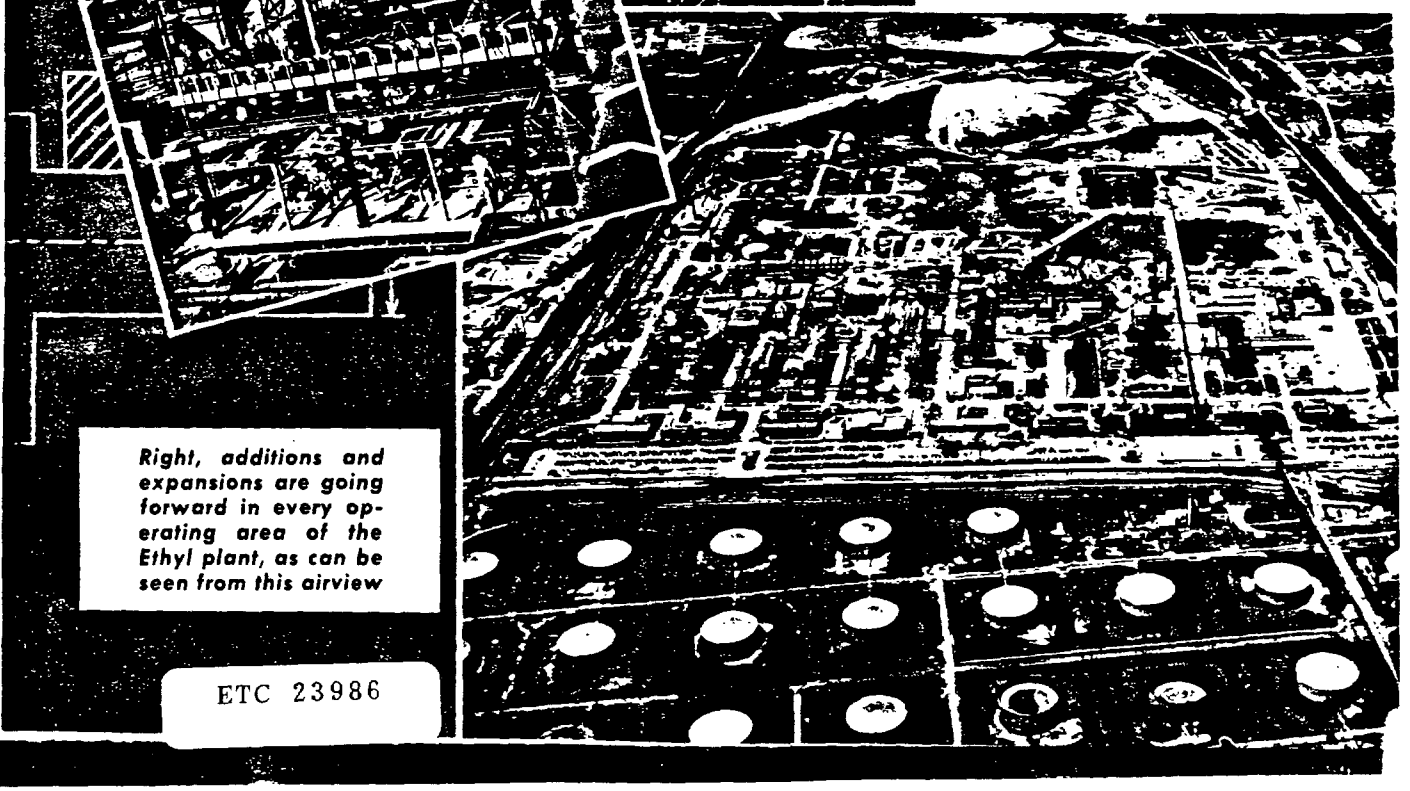


Left, the construction drafting room at the plant, and a new cooling tower

Left, the addition to the lead-sodium alloy building under construction



Right, additions and expansions are going forward in every operating area of the Ethyl plant, as can be seen from this airview

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"Ethyl" antiknock compound. Already the largest center of its kind in the world, it swung into 1949 with a new production record behind it.

Further production records are certain to be set when the current program is completed, and to reach even larger totals after the seventh tetraethyl lead building is up. Plans for constructing this unit were announced last November, and engineering studies are well under way. Together with the sixth lead building, they form the core of the overall expansion project.

The enlarged tetraethyl lead facilities, however, are by no means the only additions necessary to increase "Ethyl" antiknock compound production. Similar increases in facilities for the several intermediate chemicals manufactured at the plant are also necessary. The plant as a whole is so closely integrated that improvements or enlargements in one area have a direct bearing upon operations in other areas.

In addition to the expansion of tetraethyl lead manufacturing facilities, major construction is under way in the ethyl chloride and sodium

areas. In the sodium plant, salt is broken down electrolytically into its two basic elements, sodium and chlorine. In the ethyl chloride area, chlorine is combined with hydrogen, or common salt is reacted with sulfuric acid, in each case to make hydrochloric acid, which in turn is reacted with ethylene for the production of ethyl chloride. At times ethyl chloride is made by treating ethyl alcohol with hydrochloric acid.

Sodium is combined with metallic lead in the tetraethyl lead area to form a lead-sodium alloy, which is reacted with ethyl chloride to produce the antiknock agent. In the blender operations, ethylene dichloride – also made at the plant – and ethylene dibromide are added to complete the compound, along with oil soluble dyes. In other words, it takes all these related operations in the sodium, ethyl chloride and tetraethyl lead areas to produce "Ethyl" antiknock fluid.

A bird's eye view of the Ethyl plant today would show how extensive the expansion program is, even at this relatively early stage. Newly built installations stand out freshly. Scaffolding surrounds modern brick structures approaching their completion dates. Orange webs of steel framework are conspicuous in key areas, vibrating to the riveters' hammers and sparked by welding torches. In other parts of the plant, cranes are lifting tanks and stacks into position. Power shovels reach out over excavations. Foundations are being poured, and workmen are laying labyrinths of water, steam and electric lines, and installing other auxiliary services.

Various construction, engineering and other projects for the expansion program are providing work for about 2,500 employees of firms engaged by the company. When construction is completed, these additional facilities will provide new jobs with Ethyl over and above the 3,200 now on the payroll. Salary and wage totals, now running at an average of more than $1 million a month, will be increased proportionately. Since most of this payroll will be spent in Baton Rouge, the expansion program will benefit not only the new employees and their families, but the entire community as well.

Employee Conveniences

Approximately $1.2 million is being spent for employee conveniences. Among them are a new Medical and Personnel Building, new change houses, improvements in existing locker and shower rooms, additions to the plant laundry, and a new parking lot. In addition, a modern employee cafeteria was opened in 1946 at a cost of $275,000.

The largest manufacturing structure well along in its construction stage is the sixth tetraethyl lead building, scheduled for completion this Fall. Similar in design to the plant's other tetraethyl lead units, the five-story building will have its own adjoining wash-house, where the antiknock chemical is purified, and its own lead recovery building.

In preparation for the greater amounts of lead-sodium alloy which will be needed when the sixth TEL building is completed – and in anticipation of alloy requirements for the seventh – work is being pushed on a three-story addition to the present alloy building. Changes and improvements in existing installations are also being made. Part of the

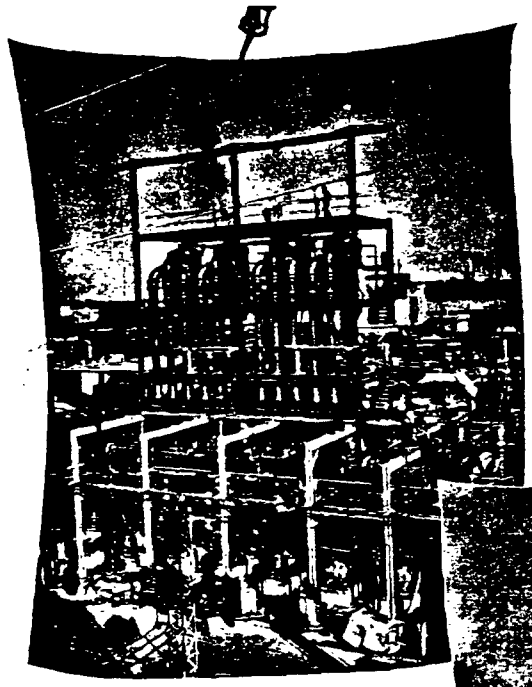
FREDERICK H. BEDFORD, JR., ELECTED A DIRECTOR OF ETHYL CORPORATION

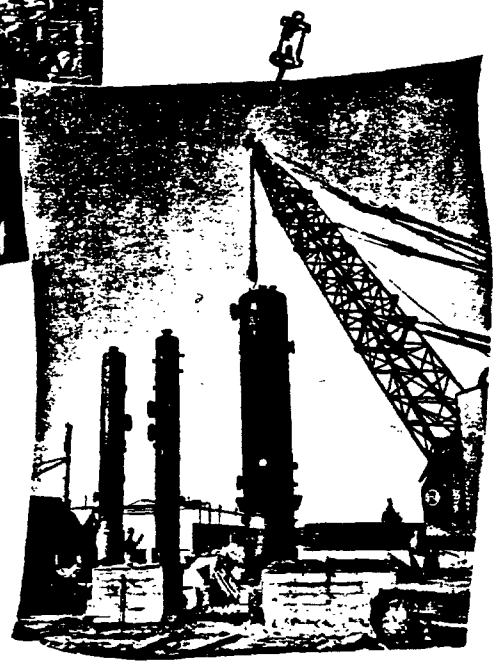
Frederick H. Bedford, Jr. has been elected to the board of directors of Ethyl Corporation.

Mr. Bedford succeeds Frank W. Abrams, chairman of the board of directors of Standard Oil Company (N. J.), whose resignation from the Ethyl board was accepted on November 1, 1948. Mr. Abrams resigned because of other obligations.

A native of Brooklyn, N. Y., and a graduate of Amherst College in the class of 1914, Mr. Bedford has been associated with the Jersey company for more than 30 years. After the first World War, he became a member of the Marketing Committee, manager of the Lubricating Department, and manager of the Specialties Department. In the late 1930's he organized and was in charge of coordinating all the Jersey company's advertising.

Active in numerous other enterprises, including those affiliated with Standard, Mr. Bedford has been associated with more than a dozen companies in organizational and key administrative positions. Among them are the Standard Oil Company of Pennsylvania, which he organized in 1928, and the Atlas Supply Company, which he established in 1930. He has been a director of Standard Oil Company (N.J.) since 1927.





Left, this new jet refrigeration unit can cool 24 million gallons of water daily for plant use. Below, a crane at work in the ethyl chloride area, where a fourth new plant is now under construction

work for alloy production is expected to be finished by May 1, and the rest by November 1.

A new air compression system for the tetraethyl lead area has just been finished. Other additions scheduled for early completion include enlarged facilities for melting pig lead, and for recovering lead and ethyl chloride from processed materials. New weight tanks and scales are to be installed in the blender, where antiknock compound ingredients are checked and rechecked in the final stages of production.

More bulk storage tanks for finished "Ethyl" antiknock fluid are to be ready by midsummer. The company is enlarging its fleet of tank cars used for delivering the compound by rail throughout the country, and will have more metal containers for drum shipments.

The first of the recent additions in the tetraethyl lead area to begin production is the new three-unit nitrogen plant, which started operations in October. Nitrogen is used during the manufacture of sodium and the lead-sodium alloy. The new plant has increased the nitrogen output at Baton Rouge by 100%.

An important addition to Ethyl's extensive water treating system is going into operation. Cooling water is required in all parts of the plant. Believed to be the largest of its kind, a new jet refrigeration unit, resembling some sort of outdoor pipe-organ, is rapidly nearing completion. The new unit can chill 24 million gallons of water a day by a unique process involving the creation of a vacuum by use of steam jets. Better cooling methods will help materially in meeting increased tetraethyl lead production, and will also assist in certain phases of sodium manufacture.

A fourth unit for the production of ethyl chloride is the principal addition to the ethyl chloride area. It can use ethylene either from the plant's own manufacturing installations, or it can use ethylene piped into the area. The new unit can be supplied with hydrochloric acid either from new or improved facilities.

Construction work on the fourth ethyl chloride unit is progressing, and will be finished during the coming summer. In some ways it will look like parts of a petroleum refinery. There will be complex stacks and towers laced together by steel framework for the reaction of ethylene and hydrochloric acid and for ethyl chloride purification. Special controls will be required to maintain proper temperatures and pressures, and for supplying the catalyst.

Among the area's new auxiliary installations are batteries of pumps and compressors, some of which have been set up and with others well along in the assembly stage. These and other general ethyl chloride facilities are about 40% ready for use, and are scheduled for completion during the Summer. An expanded system for serving parts of the area with cooling water will be in operation this month.

In anticipation of increased demands for ethylene dichloride – one of the chemicals needed in final blending operations for "Ethyl" antiknock compound – a new ethylene dichloride plant is being built. Here chlorine will be reacted with ethylene and then purified before the finished product is sent to the blender. The unit is expected to go "on stream" in July this year.

Increased quantities of chlorine to be needed in the ethyl chloride area will come for the most part from the plant's sodium operations, which are also undergoing a substantial expansion. The largest installation will

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be a double row of electrolytic cells in a new wing, where the sodium building's third cell room will be located. Sodium and chlorine will be drawn from the salt bath in the cells as the salt is broken down by electricity.

As in other parts of the plant, greater production has been possible within recent months by the introduction of specialized improvements. Ethyl already is one of the country's largest producers of sodium, and will have the largest plant anywhere after the new cells are in operation.

Early construction for the new wing is in its first stages. Sodium storage tanks formerly on the site are being relocated. Foundations are being laid and the first steelwork will rise soon. When it is finished, the sodium building will be about one-third larger than the present structure. An elaborate ventilating system is to be part of the new cell room's equipment.

One of the most characteristic features of sodium manufacture is the amount of electrical equipment required. Ethyl is building a third substation, with transformers, mercury arc rectifiers, and complex switches and controls. There will also be changes and additions in existing substations. The area now uses twice as much electricity a day as the rest of Baton Rouge combined.

Additions and improvements for the sodium area will affect all operations, from the time salt brine is first piped into the plant until finished sodium and chlorine have been manufactured. Work has started on more brine handling facilities, and about half the construction is finished for a third battery of salt evaporators. Next month will see the beginning of new work for drying, filtering and conveying salt to the sodium cells. Changes in storage areas for processed chlorine and sodium will have been made by the time the area's expansion program is finished.

The current expansion follows an earlier program for plant additions, which is rapidly nearing completion. The new Medical and Personnel Building is almost ready. Work is well along on a large new Development Laboratory and Pilot Plant, which will have extensive laboratories, equipment and special facilities for studies related to the improvements of manufacturing operations of various kinds.

The year 1949 will be a significant year in the growth and development of Ethyl Corporation – and a preparation for continued service to the petroleum industry.

OUR COVER

RISING 34 stories above beautifully landscaped grounds, the State Capitol of Louisiana in Baton Rouge stands as a symbol of a modern community in a growing state. The graceful structure, 450 feet in height, is a familiar landmark to all those who live and work in this prosperous area. Since its completion in 1932, thousands of visitors have come from all sections of the country to see the capitol's impressive entrance, the decorative chambers and foyers, rare marbles from many parts of the world, the State Museum, and the splendid view from the observation tower of the tallest building in the South.

This month Baton Rouge marks a turning point in its 100-year history as the state's capital city, and as a progressive industrial, business and residential community. In preparation for a still brighter future, Baton Rouge has extended its limits, set up a combined city-parish government, and streamlined its services under a plan which became effective on January 1. The new municipality has a population of 110,000 and covers 37 square miles.

These and other innovations are part of a comprehensive city-parish development program drawn up, after careful study, to guide the future growth of the city and East Baton Rouge Parish during the next 25 years. It will mean better homes and schools, more parks and playgrounds, improved highways and traffic control, broader opportunities for cultural life, extended police and fire protection, and sound provisions for the continued health and welfare of the community's residents. Other measures are directed towards the further development of business, commerce and industry.

As Ethyl Corporation pushes ahead with the completion of most of its unprecedented plant expansion program in Baton Rouge (see Page 3), the company and the community look forward towards their mutual growth with confidence based upon past experience, and faith in the years ahead.

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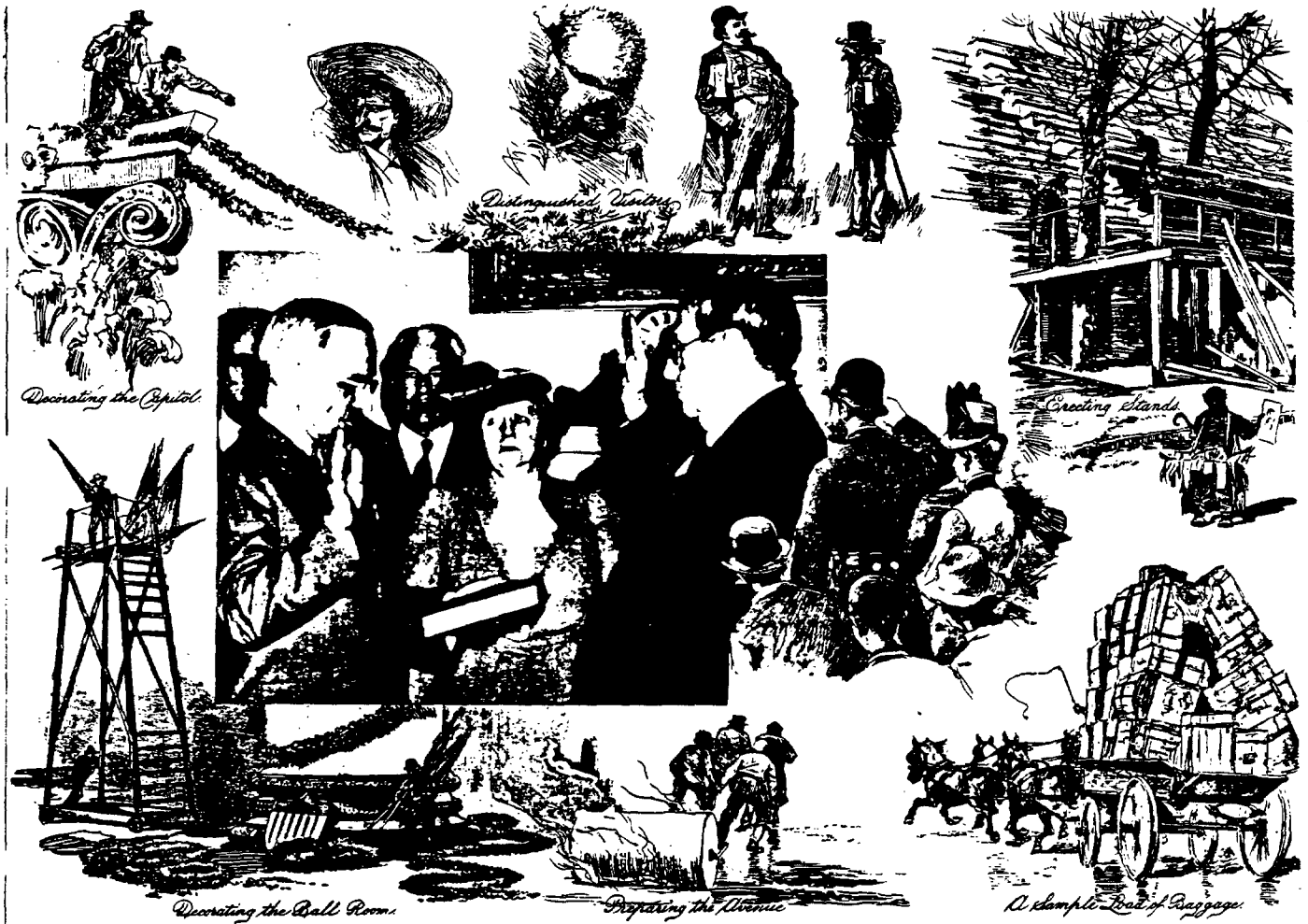

THE PRESIDENT TAKES OFFICE

Despite certain traditions that are always respected, presidential inaugurations have usually produced some surprises

By Ellis Haller

A HARRIED hotel clerk in Washington, D. C. picked up his phone one day last October to answer a reservation query.

"Yes, Madam," he told the caller, "we can still promise you a room for Inauguration Week next January. But are you sure you'll want it regardless of who's elected?"

Capital innkeepers face this problem every four years. There's always the chance of a political upset. The people who got their names down first may not want to come after all. But there's something about a presidential inauguration that brings people pouring into the capital regardless of whether they backed the winning candidate.

Long before the political campaigns came to their feverish end last election eve, most of Washington's choice hotel rooms were "booked solid" for the inaugural celebration two months later. Rooming houses and tourist homes jacked up their rates. Window space in buildings facing Pennsylvania Avenue – scene of the traditional parade from the Capitol to the White House – was at a premium. The pollsters had predicted the first big change in the federal government in 16 years and many of the early reservations came from followers of Governor Thomas E. Dewey. But when President Truman worked his own political miracle to gain a full four-year term, his jubilant supporters were quick to snatch the space surrendered by disappointed Deweyites.

Even for a city accustomed to lavish entertainments and colorful parades, the inauguration isn't an event to be taken lightly. As long ago as last October, workmen started the quadrennial whitewashing of the

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greyish-brown sandstone that makes up the central portion of the Capitol building. The outgoing Congress had appropriated $79,372 for stands and platforms near the Capitol steps, and workmen began erecting these fully three months ago—"So we'd be sure we'd get scarce lumber," explains Capitol Architect David Lynn, whose office supervises the job. Inflation has hit the inaugural ceremony, too, for back in 1941 the whole show, including invitations and incidentals, cost but $14,687. And in 1945, when Mr. Roosevelt held his third inaugural on the White House back lawn for reasons of wartime austerity, the cost was next to nothing.

Something new has been added to this year's inaugural props – a stand for the television cameras. This bit of steel and wooden platforming cost about $1,600. The President's covered platform, directly in front of the Capitol steps, contains some steel girders left over from the days of President Benjamin Harrison.

The main part of the platform provides 828 seats for cabinet officers, Congressmen and Supreme Court justices. At a cost of $27,000, this figures out to about $32 to seat each of these dignitaries. Directly in front of this stand is a section of benches for the semi-important people, diplomatic attaches, and other guests of the government. This "main" public section was set up at a cost of about $41,000. There's standing room – absolutely free – for some 125,000 members of the general public.

All this is in startling contrast to the meager facilities provided for Abraham Lincoln's second inauguration in 1865. Lincoln stood on a tiny, uncovered clapboard platform. It was the smallest such stand in the memory of the Architect's office.

Some presidents have vetoed the expense of putting up stands and seats. President Harding, for instance, declared he'd just take the oath of office on the Capitol steps and do away with the trimmings. He changed his mind when a private construction company offered to put up "suitable accommodations" at its own expense.

Learning the People's Choice

It is a curious custom that while each political party at its convention takes great pains to give its candidate for the White House a ceremonious official notice of that fact, the man who is finally elected president isn't officially waited upon by any delegation to tell him he's the people's choice. However, by a careful reading of the newspapers and attentive listening to the radio, the successful contender usually learns he has been elected. President Truman, for example, learned of his success early in the morning of November 3, while listening to returns over the radio with a few friends in a Kansas City hotel room.

Inauguration protocol varies depending on whether a new president is picked, or the old one re-elected. If the president is a newcomer, he usually arrives in Washington a few days before the ceremony, visits the White House to pay his respects to his predecessor, and rides with him to the Capitol to take the oath of office – on the outdoor platform if the weather is good, in the Senate chamber if it's inclement.

President Truman, having been chosen to succeed himself, will merely ride to the Capitol with Mrs.

Benjamin Harrison's inaugural ball was a grandiose affair but probably not quite as large as this artist's conception

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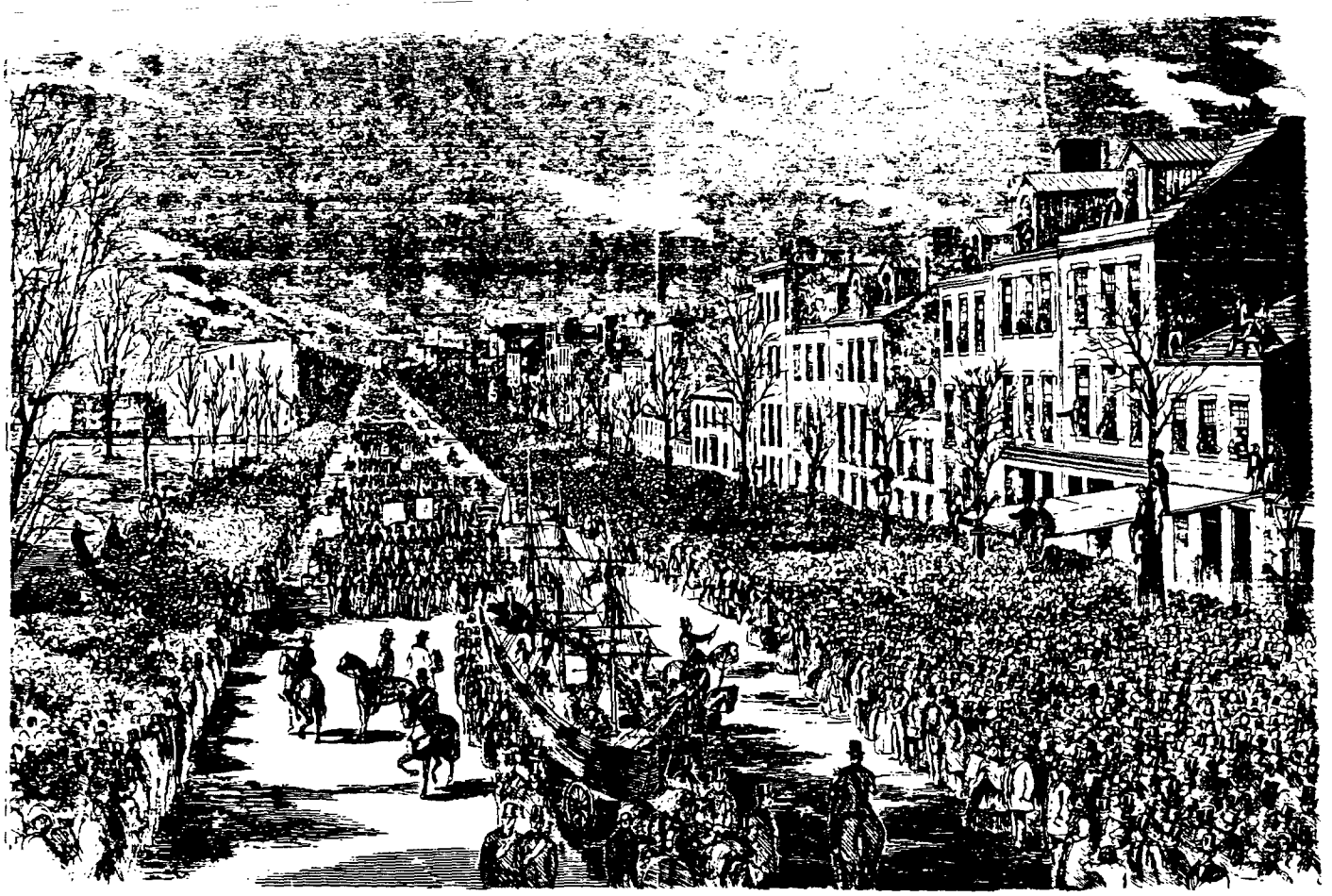

James Buchanan's inaugural parade was a lavish affair which included a "ship of state" that was "floated" down Pennsylvania Avenue. Today's parades have a different flavor

Truman to take this traditional vow: "I do solemnly swear that I will faithfully execute the office of President of the United States and will to the best of my ability preserve, protect and defend the Constitution of the United States."

Nowadays, everyone knows his role in the Big Show, and events go off with precision. A tradition and ritual have grown up about the business of installing a chief executive. But that wasn't the case at the first inauguration in April of 1789, when General George Washington made his way on horseback from Mount Vernon to Federal Hall, at the corner of Broad and Wall Streets in New York. With no precedent before them, members of the first Congress were at a loss as to how to provide a fitting welcome for the new president.

The Senate, indeed, was still debating the question when the appointed hour came and members of the House of Representatives trooped into the chamber. About that time someone remembered that the Committee on Arrangements had forgotten to meet General Washington. They hurried off, to return about an hour later with the President. He was dressed in dark velvet with black silk stockings. His white wig was topped by a cockade, and he still wore the steel-hilted sword that was the badge of his generalship.

After Chancellor Livingston of New York administered the oath of office, Washington and the legislators went back to the Senate chamber for the inaugural speech. The Father of His Country was far from an orator. He fidgeted nervously, thrust his hands in and out of his pockets, and fumbled the pages of his speech as he read.

Since that time, inauguration speeches have been an inevitable part of the ceremony. Of late years they've been formal, stylized addresses written by presidential assistants, but that wasn't always the case. Andrew Jackson's remarks were the shortest on record. Lincoln's address was one of his greatest — a simple, moving plea for unity at a time of national crisis. Jefferson's first inaugural speech was long, fervid and flowery.

William Henry Harrison, who took office in 1841, was one of the first presidents to benefit from the services of a ghost writer. The original draft of his speech was a rambling affair, filled with allusions to Greek and Roman mythology. Har-

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rison handed it to Daniel Webster, his secretary of state, for a quick perusal. Webster started pruning. Later that evening, when Webster's landlady noticed that he seemed tired and worried she asked if anything had happened.

"You'd think so if you knew what I have done," Webster replied. "I have killed seventeen Roman proconsuls." But even with this slaughter, Harrison's speech remained a quaint and labored vehicle.

Washington's weather, always unpredictable, has been responsible for some tragic consequences to inaugural festivities. Harrison took office on a raw and gusty March day. Whig friends tried to persuade him to take a covered carriage. But Harrison insisted on mounting a white horse and riding bareheaded to the Capitol. He caught cold, took to his bed and died from pneumonia a month from the day he was sworn in.

This had a distressing parallel decades later at the inauguration of Herbert Hoover in March of 1929. It was a bitterly cold, rainy day. Heading the inaugural parade was a Sioux Indian, a magnificent figure stripped to the waist, riding a brown horse. The rain and sleet delayed the procession, and the Indian sat patiently for hours, disdaining a coat or blanket. He developed pneumonia, and died a few days later in a Washington hospital.

Canaries Froze

When Ulysses S. Grant took office on a chill March day in 1873, the thermometer hovered close to zero. A new temporary building had been put up for the inaugural ball, but the architects had forgotten to provide any way to heat it. The doves of peace that were to have been released over the inaugural dancers froze to their perches; canaries imported to twitter to the dance music, froze in their cages. Spectators who had paid for tickets to the affair wrapped themselves in blankets and swigged rum and whiskey to keep from freezing.

The "Lame Duck" constitutional amendment of 1933, moving Inauguration day up from March 4 to January 20, served only to make the chances for chill winds and snow more likely.

The inaugural is a time for the usually-staid capital to cut loose with a Mardi Gras of merrymaking. Such celebrations date back to the first inaugural of Andrew Jackson in 1829. Historians recall the wild enthusiasm of that era, with "balls, cannon, parades, speeches and banquets." It was the greatest free-for-all since the end of the war of 1812, but it wasn't to be the last.

When Jackson, known as the "peoples' president," first took over, his followers from all over the country swarmed into Washington. They choked the streets as he walked from his rooms at Gadsby's tavern. They swept away the barriers that had been put up around the Capitol. Finally, they scrambled and fought their way into the White House to wish "Old Andy" well. Waiters with trays of refreshments were bowled over by enthusiastic guests, and the sound of breaking china and glassware rose above the shouts of the well-wishers.

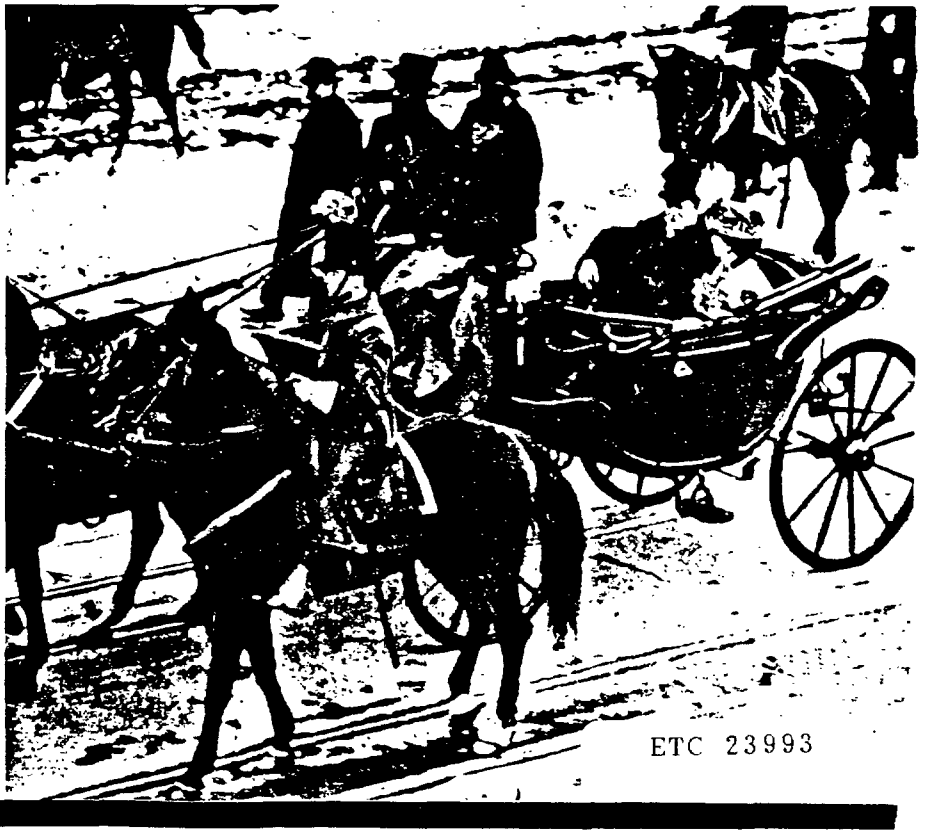
Rousing Parties

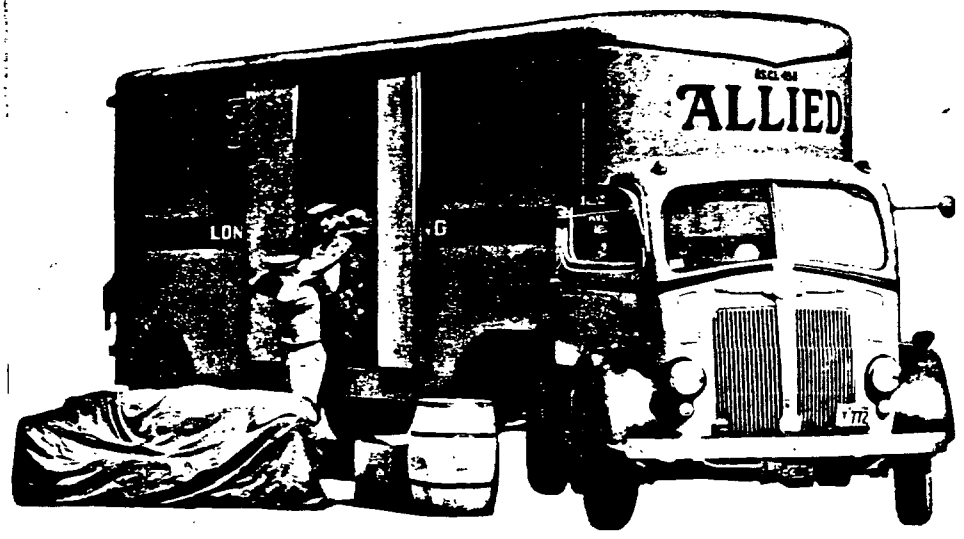
The scene found a curious repetition more than a century later, when Mrs. Eleanor Roosevelt broke latter-day precedent by serving an inauguration tea, permitting nearly 1,500 guests to wander freely about the hitherto sacred precincts of the White House. A capital dowager, surveying the horde of Roosevelt admirers, sniffed haughtily, "There'll be more food ground into the White House rugs the next four years than there has been since the days of Andrew Jackson."

But the Roosevelt tea was a pale

(Continued on Page 26)

William Howard Taft's wife created tradition when she rode with her husband during his inaugural journey to the Capitol





PRIME MOVER

Today, modern movers do everything from washing and packing your dishes to setting up your new home

LIFE with father never became so dispiriting as when he announced that the family was going to move to another dwelling. Particularly a dwelling in a different town.

That meant only one thing. Long, tedious weeks of "making ready" and then that back-breaking, nerve-wracking period of uncrating the household effects and putting them into their proper places in the new domicile.

The routine went something like this, you may recall: The warehouse man came and carted off your goods for crating. After that, he hauled them to the railroad terminal or steamship dock for shipment to your new home town. There, your belongings were delivered to your home, crates and all, and that's when the fun really began. Armed with hammer and crowbar, the male members of the family set about unhappily to rip open the countless packing boxes and barrels. But that wasn't all. Ahead lay the thankless job of arranging and re-arranging the furniture in the various rooms.

To add to the general confusion, there was always the possibility that your precious belongings might not arrive anywhere near the appointed day, for their prompt dispatch depended upon such variables as train and boat schedules and the alertness of the warehouseman at either end of the line. At best, it would be a week before you would see your household effects again, even if you were moving only 100 miles or so.

Today all this is changed: another conquest for the indomitable combination of modern motor vehicles and modern highways. With this twosome, distances shrink from days to hours, and moving, whether just down the block or to a city 3,000 miles away, becomes a virtual effortless operation for the householder. Even entire business firms – or offices and departments of those companies – are transferred on wheels, and with little disruption in their commercial activities.

The inherent advantages of moving by van are obvious. You deal with but one common carrier; expensive, time-consuming crating is unnecessary; and household and office goods are less apt to be damaged because they receive less handling. As a result of these benefits, we have, in a single generation, reversed our national moving habits. In the World War I era, nine of every 10 moves were by rail or water. Now it is the

Allied's vans are inspected frequently and breakdowns are rare; but when a driver is overdue, a tracer crew quickly goes to his aid

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other way around in favor of motor shipments.

The business of moving household goods by motor vehicle, now such a highly specialized trade, was born in the early 1920's. Our national highway building program was under way in earnest. Trucks, which had seldom ventured beyond city limits before, covered themselves with glory in the war and were literally going places. Better fuels to operate better engines were becoming available. Encouraged by these and the other developments of the time, more and more warehousemen branched out into the transportation of household goods, and for progressively longer distances.

Despite the current housing shortage, Americans are still on the move by the millions. People, of course, change their place of dwelling for any of a number of reasons. The husband is transferred to another city by his company. The parents move to a college town to be near their son or daughter, who has entered the university. Too, many leases now are on a month-to-month basis, causing more householders to move more often. No longer are May and October the traditional moving months; America's van lines are operating at peak capacity every month.

Many Are on the Move

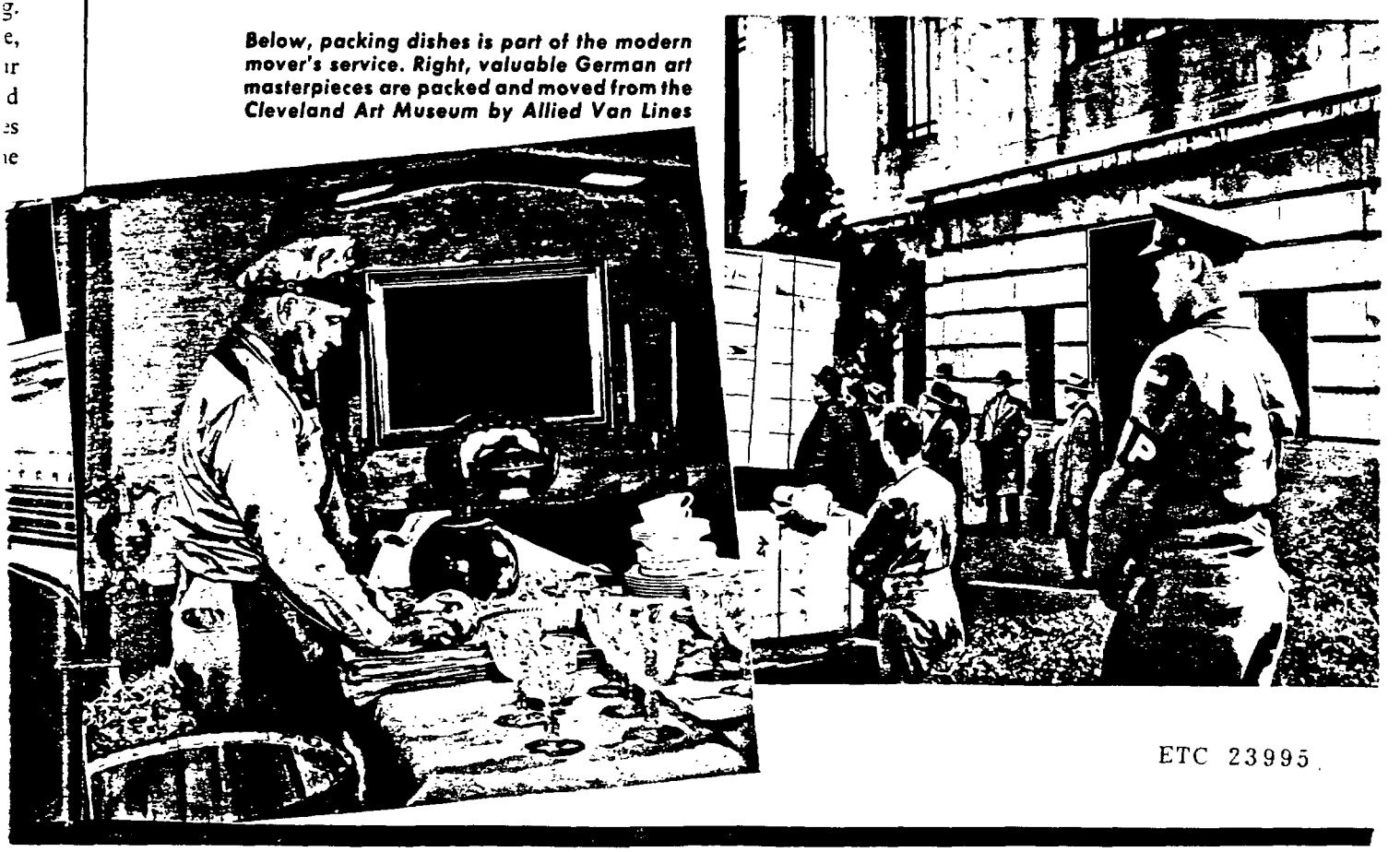
To serve the estimated 7 million U. S. families that change residence each year there are some 4,000 common carriers of household goods. They operate, according to Interstate Commerce Commission estimate, 25,000 motor vehicles, ranging from the handy 1½-ton pickup to massive vans of capacities equal to those of railroad freight cars. Most of the larger units, of course, are operated in long-distance service. By some motor carrier standards, that means a haul of at least 150 miles from the old address to the new. By ICC standards, it means anything interstate outside a city commercial zone.

There are several well-established carriers which, through exclusive use of the dependable moving van, are equipped to transport your household belongings to and from any point in the country. And, to do it quickly and safely.

Of all the nationwide movers, Allied Van Lines, Inc., with general offices in Chicago, is the largest, both in fleet size and volume of business. The orange-and-black Allied van is a familiar sight everywhere, for these units travel almost 25 million miles in completing their more than 70,000 different moving jobs each year. This schedule – averaging one moving job every 7½ minutes – calls for the operation of an active fleet of over 1,000 vans plus the maintenance of a reserve fleet of 800 vehicles for additional service. In a normal year, this rolling stock carries household and office goods valued at close to $170 million.

Allied is a family of 475 agents, located in 360 principal cities of the country. Allied agents are stock-

Below, packing dishes is part of the modern mover's service. Right, valuable German art masterpieces are packed and moved from the Cleveland Art Museum by Allied Van Lines



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holders in the company, and each conducts a local hauling and storage business over and above his affiliation with the van line. As an Allied representative, the agent is bound to register with the company all shipments to move more than 150 miles scheduled by him, to haul loads booked by Allied through any of its agents, and to maintain vehicles bearing the Allied name and colors and meeting Allied's exacting specifications.

It is this uniformity of soliciting, booking, and dispatching that enables Allied, like the other transcontinental movers, to render swift and economical service to the nomadic public.

Eases Householder's Burden

With the motor vehicle as their indispensable partner-in-trade, the long-distance van lines have developed moving into such a scientific procedure that the householder need expend little more effort than just to make known his intention to move. In Allied's case, for instance, an estimator calls at the home to compute how much the moving job will cost, based on weight and value of the goods and the distance they are to be moved. Next, professional packers arrive to prepare even the tiniest breakable for a safe journey, be it only from New York to Baltimore or cross-continent from Miami to Seattle.

Comes moving day and your worries are only as few. The moving crew pulls up to your door in a specially-constructed van that is weatherproof and dustproof. Heavy padding is provided for your furniture, runners are laid to protect your floors, rugs are rolled and hung in straps, mattresses are slipped into cartons to prevent soiling, and clothing is hung in wrinkle-proof wardrobes. On occasions, movers will even wash breakfast dishes, pack stray pieces of clothing, collect collar buttons left on the bedroom dresser, and empty ash trays.

It's as easy and simple as all that, too, when your household effects reach your new home. No more prying open crates and lugging heavy furniture from room to room. The unpacking and the placement of pieces in their appointed positions in each room are all part of the service. If you want, you can even take a stroll while being moved into new quarters. Just leave a rough sketch of where you want the sofa, piano, bed, etc., placed. When you return, you're all moved in.

The van foreman, and master of your moving destiny, is the driver of the vehicle. Captain probably would be a better word than foreman. For, like the skipper of an ocean liner, the long-distance van driver must know far more than merely how to guide his craft to its destination.

To even get a job as a driver, a man must measure up to strict ICC regulations covering general health, eyesight and age. He must also have had at least one year's driving experience in all types of weather. The average Allied driver is a 10-year veteran.

The driver must know how to stack his van so that the load will neither shift nor flounder en route. He also must be an expert in assembling and disassembling furniture, and very likely he can tell whether any given piece is a Duncan Phyfe or Hepplewhite, mahogany or walnut. Too, he must supervise such delicate assignments as maneuvering a piano down a circular staircase.

Because he may be routed to any section of the country, the driver has to be familiar with the laws and traffic regulations of all 48 states. For instance, he knows that in Michigan he must have permit plates and also must complete a form that details his mileage within the state. In Kentucky, his tractor and semitrailer cannot exceed 45 feet in length on Class A and B highways or 30 feet on other roads. Wyoming requires the purchase of "one-trip" permits. On the average long-distance haul, an Allied driver will fill out or handle nine different reports covering his load weight, mileage, permits, and other items. That makes him a bookkeeper as well as a professional driver, moving expert, and walking encyclopedia of state traffic regulations.

In compliance with ICC and Allied's own regulations, all vans are inspected at frequent intervals to assure that they are in safe operating condition. These inspections are over and above the preventive maintenance checkup each driver gives his vehicle before starting a trip. Mishaps on the road are seldom as a result of these inspections, but when he does suffer a breakdown the Allied driver is not long without help.

Tracer Crews When Needed

Through an intricate system set up by Allied, the approximate whereabouts of every van is known at all times. If the driver fails to report to the nearest of Allied's 17 nation-wide district offices within a reasonable length of time, tracer crews seek out the distressed van along the highways that have been mapped for its journey. In each of the 17 district office cities, specific parking-lot service stations have been approved for use by Allied vans. These lots offer reliable repair service and carry the best gasolines and lubricants. Allied, as might be expected, is a major user of petroleum products. The corporation uses more than 4 million gallons of gaso-

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line and about 12,000 quarts of oil annually.

Except as governed by state regulations, no load is too large or too small for Allied to handle.

By and large, from the standpoint of volume of goods transported, the biggest Allied job on record was the Federal Decentralization Move shortly after Pearl Harbor. This herculean wartime effort to re-locate many governmental agencies in Eastern and Midwestern cities perhaps less apt to be bombed than Washington required the use of every available Allied van and employee on a day-and-night schedule. Allied's participation, amounting to a large percentage of the total hauling, consumed about nine months of 1942. During that time, the Wages and Hours Office, the Veterans Administration, the Farm Credit Administration, the Patent Office, and several divisions of the Agriculture Department were moved inland or scattered along the Eastern Seaboard. Not only was the office equipment of these agencies moved, but the household effects of many employees as well.

Other notable wartime moves by Allied included the transportation of household and office goods into the top-secret Oak Ridge, Tenn., atomic bomb settlement, and the movement of countless similar loads into hundreds of camps on behalf of ever-shifting armed forces personnel. Still another was the hauling of tons of negotiable cotton warehouse receipts for the Federal Reserve Bank of New Orleans. To this day, Allied doesn't know the value of those shipments, but they totalled in the millions of dollars.

On the less somber side, consider the lot of the crew of an Allied agent in New York City. Each year this agent moves a New York society woman to and from her summer home in Newport, R. I., and just as often the gracious society matron tenders the moving men a formal luncheon. Seated in the luxurious dining room of her Fifth Avenue residence, the crew enjoys champagne and all the other trimmings with Hudson, the butler, and John, the footman, but a finger-snap away to serve them.

Van Gogh in Transit

One of the more recent outstanding moving jobs performed by Allied, among others, was the handling of a multi-million dollar collection of famous paintings for showing in leading cities. The paintings were part of a cache uncovered by GIs in a German salt mine. After a period of safe storage in the National Gallery of Art in Washington, many of the renowned works of art were returned to Germany. The remaining Holbeins, Rembrandts, Van Goghs and others were sent on tour of the United States for American art lovers to behold. The collection was estimated at between 80 and 100 million dollars, and very likely was the most precious cargo ever hauled in a moving van.

Whether the load is worth millions or only a few hundred dollars, moving vans deliver the goods safely and on time. But more significantly, they give Americans, literally, a greater freedom of movement than any population ever has enjoyed. It is impossible to name a community which the great vans of Allied and other similar common carriers, traveling our vast network of 3 million miles of highway, can not service.

"Never mind, dear, you'll be a father yourself someday."

ETC 23997

Ethyl has produced a new safety show that dramatizes the safe handling of gasoline around service stations and bulk plants

DURING the past two years, Ethyl Corporation presented before oil company refinery audiences a novel show that dramatized the safe handling of gasoline. The show, which was an outgrowth of wartime educational activities conducted in behalf of the Air Transport Command, consisted of five separate "road companies" that toured the country in station wagons. The five units, each of which was directed by an Ethyl safety engineer, covered more than 100,000 miles and put on 562 performances before some 35,000 people engaged in refinery operations.

Now, in response to many requests, Ethyl has adapted its refinery presentation for people engaged in the marketing and distribution branches of the oil industry. The result is a new production entitled "Fire Power," which will be presented before oil company audiences from coast to coast.

While developing the same theme of safe handling of petroleum products, the new show is substantially different from its predecessor. In the first place, it has been written in more simple terms for the benefit of non-technical people. Further, it concentrates on hazards such as those encountered around service stations and bulk plants, and presents a series of eight new demonstrations explaining these hazards. All told, the show has a lighter tone and faster pace which make for a more interesting presentation from beginning to end.

Based on Authentic Cases

The new show is based on case histories on fires supplied by oil companies, A. P. I., N. F. P. A., and other sources. It covers the principles of fire and the characteristics of gasoline and its vapor. Then it demonstrates some common causes of gasoline fires and the principles of fire fighting. In conclusion it shows the power of gasoline in an engine.

The show points up the fact that all fires are based on a combination of fuel in the form of vapor, sufficient heat for ignition temperature, and oxygen from the air – and relates

Showing how an unprotected light can create a hazard in the presence of gasoline-air vapors, Lou Wilson, of Ethyl's Central region, prepares to shatter a lighted bulb with a few drops of cold water

While kerosene will not ignite at room temperatures, it can be as combustible as gasoline in the form of a spray, as Douglas P. Jeppe, of Ethyl's Southern region, demonstrates

this to gasoline and other petroleum products.

Such equipment as trouble lights, heaters, and electric motors are widely used where gasoline is sold or handled, and improper use of these and other electrical equipment has resulted in many accidents. The Fire Power Show demonstrates how careless use of this equipment may ignite gasoline. An electric motor, an arc such as that from a light switch, and a breaking light bulb are used to ignite gasoline-air vapors. The lighted bulb, for example, is shattered by a drop of cold water as it is being held over an open beaker of gasoline. Demonstrations such as these are designed to illustrate the importance of special safety devices and precautions recommended by the oil industry.

William G. Ball, Jr. performing one of the 21 demonstrations in the Fire Power Show. He recently presented the show over television

One phase of the show involves static electricity. To illustrate its hazards, the Ethyl representatives put on a series of demonstrations which reveal that much damage can be caused by uncontrolled static electricity.

In one of them, the static is generated by lifting a metal disc from a plastic plate. The charged plate is then held against a terminal attached to a transparent plastic tank containing the vapors from twelve drops of gasoline. The narrator completes the circuit by gripping another terminal on the tank with his hand. The static arcs in the tank and the resulting explosion blows a paper roof off the tank.

In dealing with the precautions to be taken in handling high flash point fuels such as kerosene and fuel oils, the Fire Power Show approaches the problem by dramatizing the well known rule that almost any material will burn if it is in a finely divided state. To demonstrate, the Ethyl lecturer ignites some steel wool with the flame from an ordi-

MAX M. ROENSCH ELECTED A VICE PRESIDENT OF THE SAE

Max M. Roensch, of the Ethyl Corporation Research Laboratories in Detroit, has been elected vice president of the Society of Automotive Engineers for the Diesel Engine Activity for 1949.

At the Ethyl Laboratories, Mr. Roensch is on the Automotive Products Research Staff as Engine Development Coordinator. This assignment places him in charge of research and development pertaining to the power, economy, and durability of engines. He has 22 years of experience in internal combustion engine research and is widely known throughout the petroleum and automotive industries for his work in this connection.

Mr. Roensch has been active in the affairs of the national SAE organization and the Detroit Section of SAE since 1937. He has served as chairman of both the membership and meetings committees of the Diesel Engine Activity, and was chairman of the Detroit Section's Passenger Car Activity for two years during the recent war. In addition, he is a charter member of the Engineering Society of Detroit.

He received his B.S. degree from Rice Institute and his M.S. from the University of Michigan.

Prior to joining the Ethyl Laboratories two years ago, Mr. Roensch was associated with the Engineering Laboratories of the Chrysler Corporation and also was chief engineer of the Cleveland Graphite Bronze Company.

nary cigarette lighter. He then shows that kerosene in a beaker will not burn when exposed to the same flame, but when he sprays it at the flame with an insecticide gun the spray readily flares up.

In this connection the hazard of contamination of high flash point fuels is demonstrated by pouring a small quantity of gasoline into a beaker containing kerosene. The resulting mixture ignites as easily as gasoline itself.

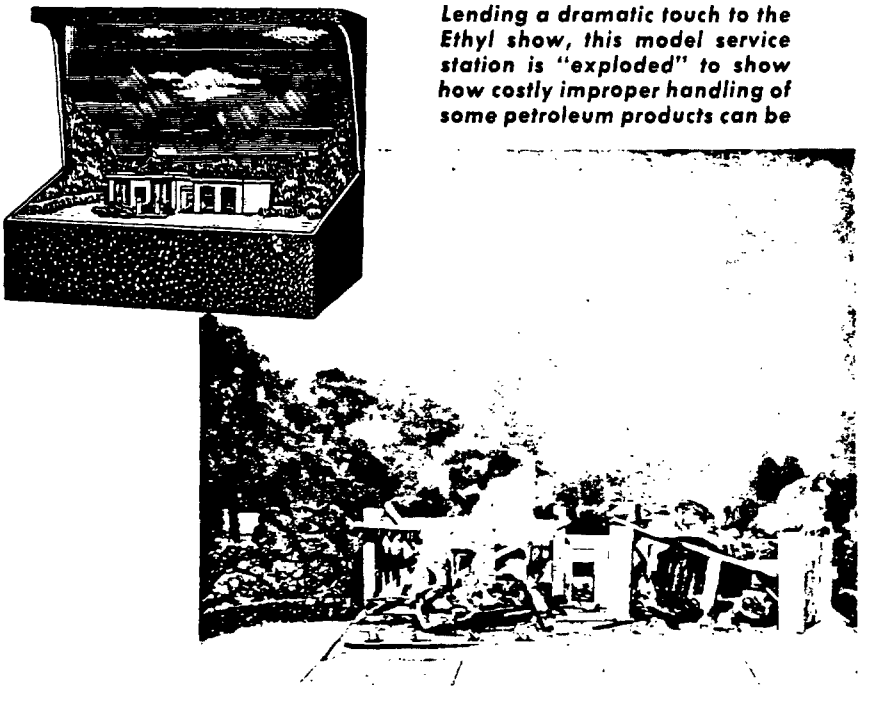
New Automatic Projector Used

Aside from the use of dynamic demonstrations, the Ethyl representative also uses a slide projector to project part of the Fire Power story onto a screen. This machine, which is operated by remote control, automatically changes and projects each slide, and controls the house lights. It does much to promote the smooth progress of the story.

Almost a year of preparatory work has gone into the show. Many hours were spent developing the 21 demonstrations and making them reliable and durable enough to be used day after day by the performers. Much special equipment had to be designed and produced. Finally, to check the show's effectiveness, previews were held in different parts of the country.

All five units of the new Fire Power Show are expected to be on the road and in full operation some time this month. Eight men from Ethyl's Sales Department will put on the show in four different regions throughout the country. The demonstrators are Louis L. Wilson and Robert L. Smith, Central region; William J. Rusher, Eastern region; Douglas P. Jeppe, Arthur Dale Miller, and R. Grant Scott, Southern region; and William O. Van Wyck, Jr., and John F. Koehnle, Western region.

Ethyl hopes that its new Fire Power Show will assist oil companies in their general educational efforts to eliminate the unsafe practices which lead to fire and accident and, often, serious loss.



Lending a dramatic touch to the Ethyl show, this model service station is "exploded" to show how costly improper handling of some petroleum products can be

ETHYL SERVES THE PAPER INDUSTRY

Salt cake produced at Ethyl's Baton Rouge plant is stored in this warehouse prior to shipment

Salt cake produced by Ethyl — and now to be marketed by its new Chemical Sales Division — plays an important role in the manufacture of kraft pulp

PEOPLE cart home their daily groceries in a lowly paper bag, wrap up a package in a sheet of brown wrapping paper – and look upon the bag and the wrapping paper as small, everyday essentials. Yet, to the paper industry those items are anything but small or humble. For these products – and hundreds more like them – are the output of an important and growing division of the paper industry. That division is kraft paper.

Kraft paper has had an almost meteoric rise since the 1930's.

Twofold Expansion

Not only has it been gaining in its own right, as a result of its expanding consumption and widening usefulness, but it has taken on a larger stature in the paper picture as a whole. Paralleling the rise of kraft paper has been the growth of kraft paperboard, which is used principally in shipping containers. Together the two account for about a fifth of all the paper and paperboard produced annually in the United States, which last year set a record at more than 22 million tons.

In recent years, Ethyl Corporation has been privileged to serve the kraft paper industry by supplying it with sodium sulphate, commonly known as salt cake. Salt cake, which plays an important role in the manufacture of kraft or sulphate pulp, originates as a by-product of the Corporation's ethyl chloride operations in its Baton Rouge plant. Now, however, Ethyl Corporation will market salt cake directly to the paper industry through its newly-formed Chemical Sales Division.

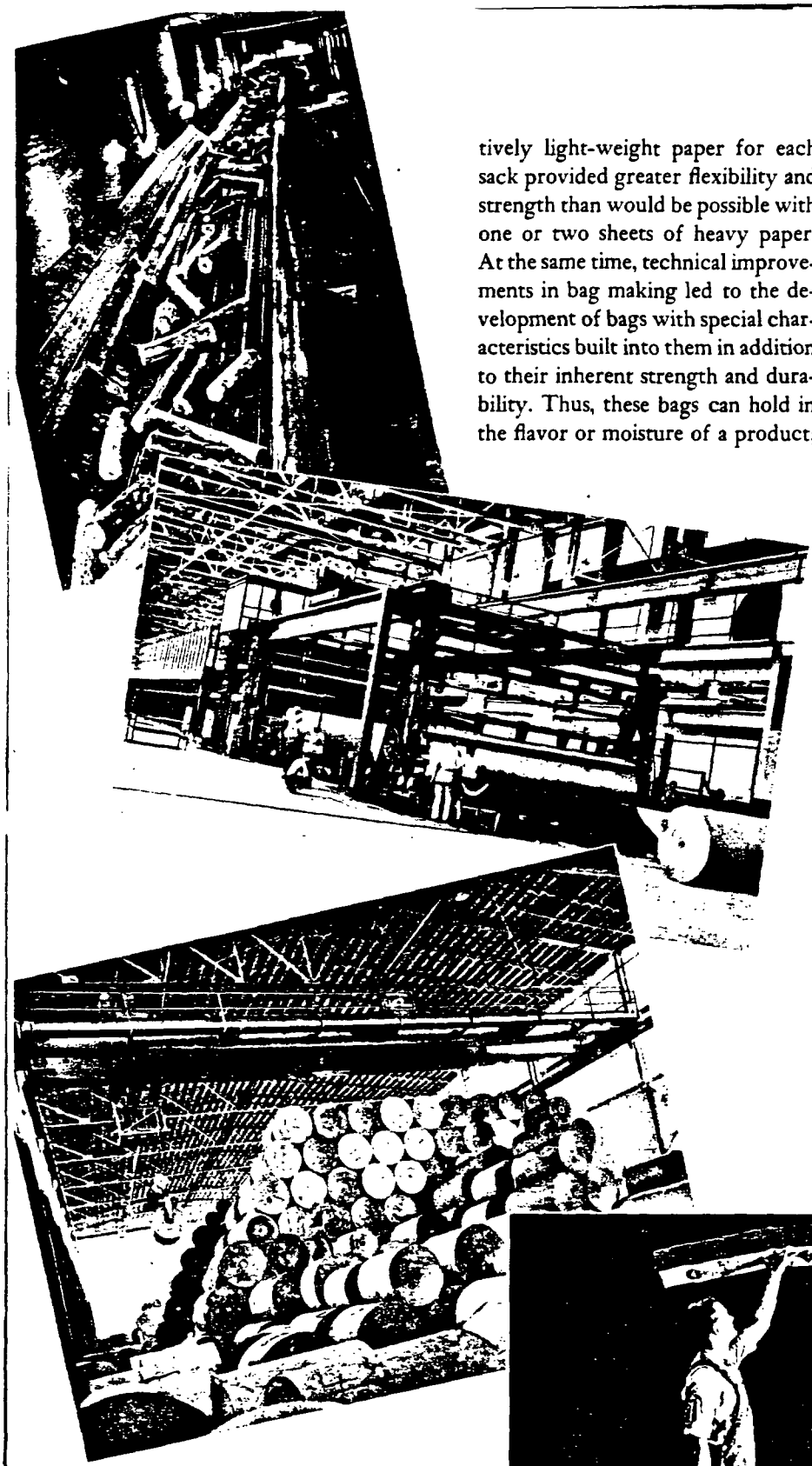
Kraft paper came into its own, over the years, because of its extreme strength and toughness; in fact, the word "kraft" itself is from the Swedish and means strength.

Originally, kraft paper was introduced into the United States, shortly after the turn of the century, in the form of wrapping paper – and wrapping paper is still an important outlet for sulphate pulp. Next came the advent of the now-familiar paper bag – and kraft paper today is the most widely used of bag papers. But one of the most spectacular developments in kraft paper's success story came in the mid-1930's, when kraft shipping sacks made their bow.

Opened New Fields

These "multiwall" bags – each consisting of three to six separate bags in one – revolutionized shipping methods. They could be used, it was found, to package and ship – more economically – literally hundreds of products previously restricted to wooden or steel containers or to cotton or burlap bags.

The use of several layers of rela-



tively light-weight paper for each sack provided greater flexibility and strength than would be possible with one or two sheets of heavy paper. At the same time, technical improvements in bag making led to the development of bags with special characteristics built into them in addition to their inherent strength and durability. Thus, these bags can hold in the flavor or moisture of a product; protect it against outside contamination; resist fire, water, heat and cold, and can be stored in the open for more than a year.

Today, some 400 different kinds of products are shipped in these multiwall sacks, usually in quantities ranging between 50 and 100 pounds. These products include everything from foods like potatoes, onions, flour and sugar to cement, fertilizers and chemicals.

Variety of Other Uses

Meanwhile, kraft paper has found many other widespread uses. An important one is in the building paper field (for example, as an asphalt-laminated paper), where the waterproofed paper protects against dampness and moisture, acts as an insulator, and is used in the curing of concrete. Kraft paper is also used for window shades and industrial toweling, as wrapping for coins and for automobile tires, as locker room slippers, as the bottom layer of some carpeting and as seat covers for automobiles. One growing use of kraft paper is as a base for certain plastics, as for example, in radio panelling and plastic table tops.

In its natural state, kraft paper is brown in color. But with the discovery of successful bleaching methods during the 1930's still broader

ETC 24002

A few of the steps in making kraft paper are seen above. Top, debarked logs en route to the shredders. . . . Center, a paper-making machine in action. . . . Above, rolls of finished paper being stored. . . . Right, one interesting use of kraft paper is in insulating materials

fields were opened to it, for example, in milk containers and butter wraps. As a result, it has replaced sulphite pulp, and to some extent, rag fiber, in many uses.

Kraft paperboard, as opposed to kraft paper, serves such a wide market that it constitutes a separate division in itself. Kraft paperboard is used in virtually all kinds of boxes, containers and cartons, serving both as a corrugated board and as a solid fibre board. Last year, kraft paperboard production set a new record at some 2½ million tons.

How Kraft Is Made

In the manufacture of sulphate wood-pulp – from which kraft paper and board are made – the wood is cut up into small chips which are "cooked" or digested, under pressure, in a sulphate liquor. The liquor contains caustic soda and sodium sulphide, the latter being derived from the addition of salt cake. Together, these chemicals do the job of separating particularly strong cellulose fibers – which form the paper – from the lignin and other substances in the wood.

After the wood chips have been cooked or digested, the charge is then emptied into wash tanks, where the fiber is washed clean from the liquor solution, now known as black liquor, which results from the cooking. The cellulose fibers, after undergoing further treatment, are passed on to the papermaking machine in slush or liquid form, finally emerging as kraft paper or board.

Through the kraft process it became possible, for the first time, to make use of Southern pine trees in papermaking; the pine trees, in turn, provided an abundant and fast-growing raw material for paper. That fact, together with the South's abundant water supplies and availability of labor, paved the way for the South's emergence as a leading pulp and paper manufacturing area. Reflecting the progress of the paper industry at large, the South tripled its production of wood pulp in the years, 1929-1939, and is today the leading pulp producing area in the country, accounting for about four-fifths of the nation's output of sulphate pulp alone.

Interestingly enough, Ethyl's manufacturing plant has "grown up" in the center of the Southern kraft paper industry. Located in Baton Rouge, La., it is near many kraft mills; in fact, the state of Louisiana itself is a leading kraft producer, with six of the South's 34 board and paper mills located within its borders. Thus, affording a nearby source of supply for paper mills, Ethyl hopes to be of increasing service to the paper industry.

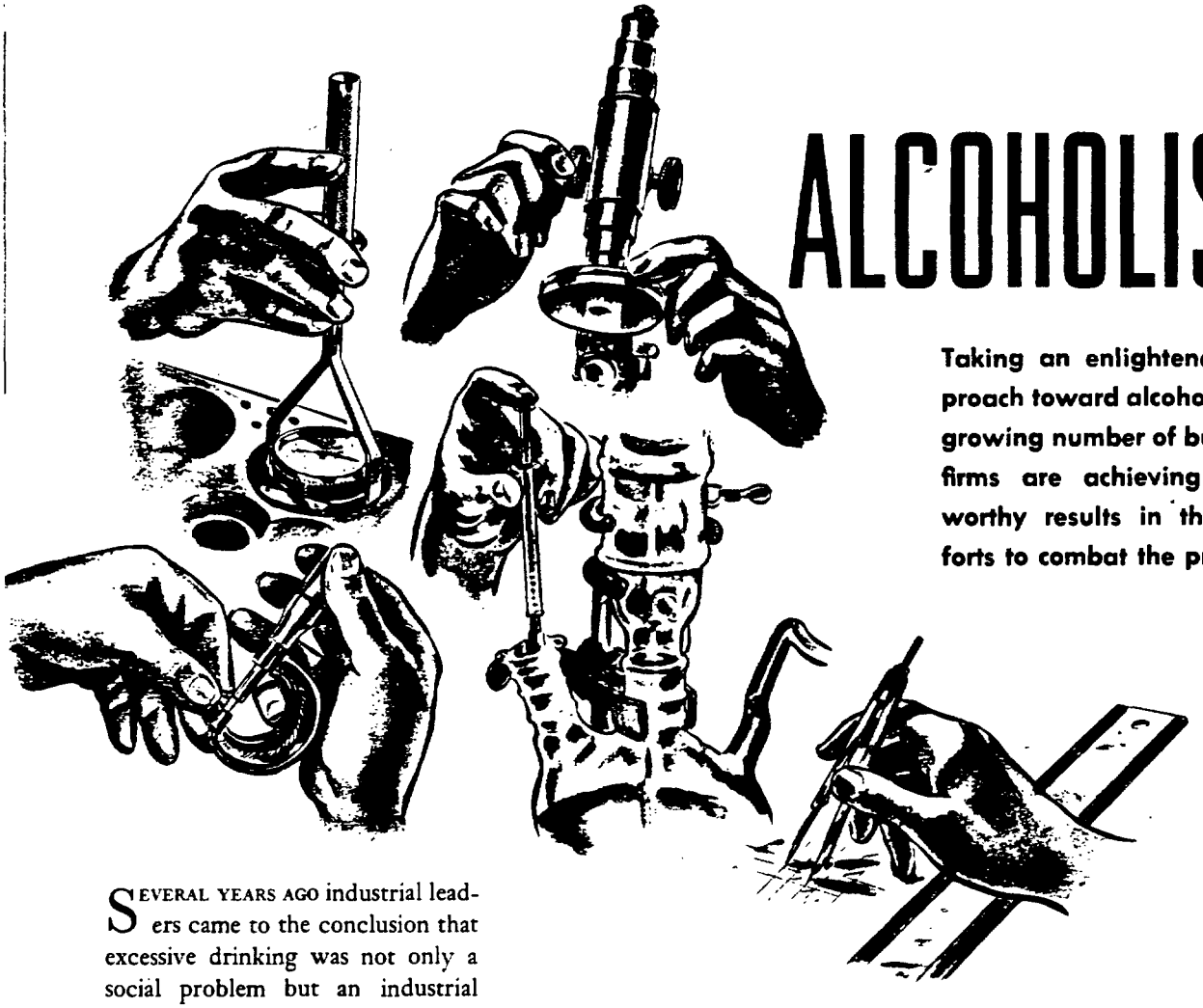
Ethyl's production of salt cake began some six years ago. This production was of material assistance to the kraft paper industry during the recent shortage of salt cake.

Made by Continuous Process

One value of Ethyl's Baton Rouge plant to the pulp industry, aside from its strategic location, is that it produces salt cake by a continuous process, and maintains substantial inventories, so that the company is in a position to provide kraft mills with an uninterrupted source of supply. Now, with the creation of its own sales division to handle the marketing of salt cake, it is hoped that Ethyl will further contribute to the growth of an industry that has contributed much to the progress of the South.

ETC 24003

Above, loading a salt cake shipment at the Ethyl plant. Right, the kraft process provided a major outlet for the Southern pine



ALCOHOLISM,

Taking an enlightened approach toward alcoholism, a growing number of business firms are achieving noteworthy results in their efforts to combat the problem

SEVERAL YEARS AGO industrial leaders came to the conclusion that excessive drinking was not only a social problem but an industrial problem as well. They learned that over-indulgence by employees resulted in lessened efficiency, declining production, lost man-hours and man-days – and sometimes to serious accidents.

Thus, they decided that it was simply good business to investigate the problem and determine what should be done. Accordingly, groups of doctors, psychiatrists, and personnel began to delve into the subject and the result was propounded recently in the form of a study made by some 400 different representatives from various industries.

The study indicated that the job of rehabilitating people who drink too much is not a trivial one.

About three persons out of every 100 employed drink enough to be considered alcoholics. It is estimated that the average alcoholic loses some 22 days each year from his job. This adds up to 28 million work days annually lost throughout all industry. One firm figured that 2.63% of its nearly 14,500 employees had lost 478 days in one year through alcoholic indulgence. This was topped by 2,209 days lost for disciplinary action. Nor did this take into account the loss of efficiency arising from hangovers and similar "unseen" but still very real costs.

The imbibing which is causing these huge losses is by no means stereotyped. As everyone knows there are drinkers and drinkers. There are those who have their occasional social drinks and at times get drunk without harm to anyone. But the drinker who feels that he must drink to exist is presenting industry with its gravest problem, according to most authorities.

These drinkers drink for a wide variety of reasons.

They may be mentally ill or emotionally disturbed, and drinking is simply a symptom of their upset personality. Such drinkers are known as symptomatic drinkers, and their condition is a symptom of a deep-rooted psychiatric disorder. Once again, an organic illness such as a simple toothache can make a person turn to liquor for pain-killing reasons. The cure in these cases is to get at the cause and eliminate it.

Another type of drinker is the social drinker who drinks too much.

He might have started drinking because his work as a salesman or business man demanded a certain amount of contact at the club or at a bar. This was the start that introduced him to a regular diet of liquor. Other factors, however, are respon-

ETC 24004

a problem for industry

sible for driving him to excess. It may be an unhappy home life or financial difficulties that will put him in the "dangerous drinker" category.

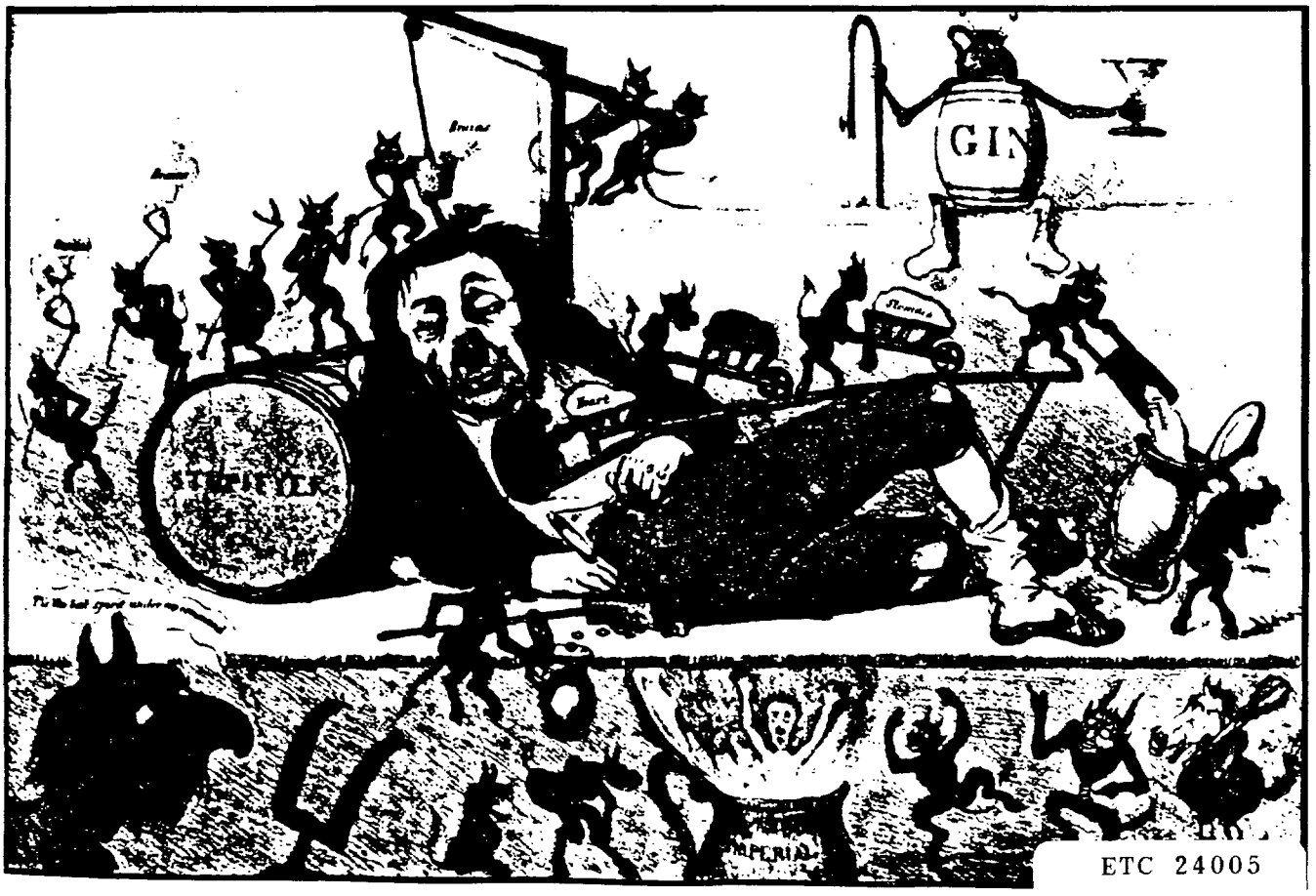
Such a drinker is known as an incipient alcoholic. He is on the brink of disaster. If the numerous irritations and mental disturbances that make a man an incipient alcoholic can be caught in time and corrected, there is every reason to believe he can be kept from crossing the line over into confirmed alcoholism.

As a matter of definition an incipient alcoholic is a drinker who: (1) gulps his drinks, (2) sneaks a few on the side, (3) worries about his liquor consumption, (4) stops talking about his drinking and (5) begins to pull blackouts, claiming to forget what has happened during his drinking bouts. Medical men caution that such a drinker is apt to be an alcoholic within two years. And once an alcoholic he will never again be able to take a drink without going completely downhill.

The confirmed alcoholic, without question, has gone the limit with his drinking. He is the most difficult of all drinkers to cure and in some cases his situation is completely hopeless. The cause of his drinking is usually so firmly embedded and complex that it defies explanation. It may be a series of youthful frustrations or something in the drinker's metabolism which causes the alcoholic "to feel right" only while there is alcohol in his system. Some medical experts are of the opinion that some people are lacking in certain chemicals which affect the nervous system. Drinking feeds these upset nerves much in the same manner that other foods make up deficiencies, but with different results.

Although scientific minds have

This old-fashioned cartoon illustrated the mid-Victorian attitude about drinking. Today, society takes a much more intelligent approach toward alcoholism and its cure



not been able to diagnose all the causes of alcoholism, the attack on the problem has made tremendous strides in the last two decades. Both public and private institutions dedicated exclusively to curing alcoholics have cooperated fully with industry in this endeavor. Alcoholics Anonymous groups have shown particularly good results with cures in about 65% of their over-all attempts, and AA today has the largest business man membership in its history.

Companies which have been actively attacking the problem of alcoholism among their employees have found that the best method is to go slow. One specialist advises industrialists to "treat your alcoholic employees as sick people, give them the same consideration you give those who suffer from other diseases. You have an investment in each employee. Protect that investment and you will profit."

Business organizations which have successfully fought alcoholism have all used similar tactics. First they consulted with doctors and psychiatrists in order to explore the problem from all angles. Then they proceeded to contact local churches and other organizations actively interested in curing alcoholics. Only then, after getting the benefit of advice and counsel from these agencies, did they attempt to cope with the problems of industrial workers. And here, it was found, AA groups offered the most effective solution.

The Alcoholics Anonymous prayer is part of their all-out effort to help the alcoholic to recover

Nagging Doesn't Work

With few exceptions almost all alcoholics want to give up drinking. Their big problem is finding someone who understands their peculiar troubles. Nagging and appealing to their feelings of self-pride have never gotten anywhere. These are the mistakes most often made by families of the stricken men. The AA man, on the other hand, can usually step in most graciously. He talks the drinker's language and he offers living proof of a successful cure. Thus he has the best chance of successfully exciting the alcoholic's desire to get well and stay that way. Thus, the road to recovery is attained by showing the alcoholic a practical way to cure himself.

Some companies have even invited AA men to become members of their personnel departments. AA members, it should be emphasized, are people who have cured themselves of the drinking habit and have returned to responsible positions. In securing the services of these people, companies have found them particularly effective in accomplishing cures among their fellow workers. Now, many companies consider it good strategy to have AA men scattered throughout their organization. The results speak for themselves. The number of top-bracket executives belonging to AA has doubled within the last five years.

Although the alcoholic and incipient alcoholic present industry with an obvious problem, the industrial and business inefficiencies caused by occasional drinkers have not escaped notice. Measured in terms of lost wages and productivity about half a billion dollars a year is lost because of all drinkers. The National Safety Council says that $120 million a year is lost because of preventable accidents caused by overenthusiastic imbibing. However, not all of these losses are caused by alcoholics and incipient alcoholics, but by occasional drinkers who have had too much.

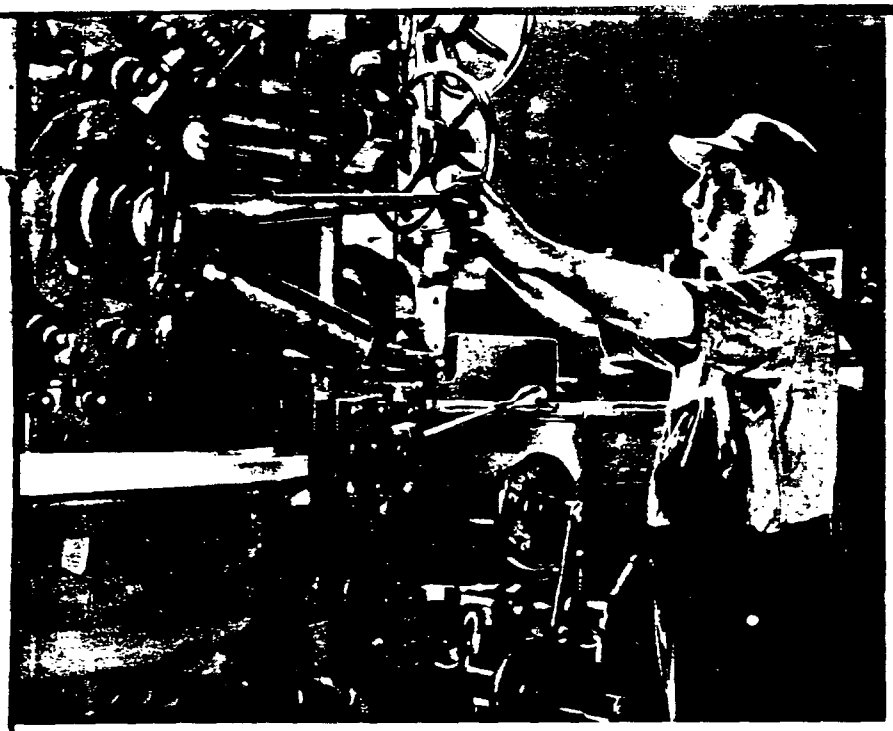
The crux of this question is, of course, how much is too much?

There is no absolute answer but an understanding of what happens when a person takes a drink does provide some valuable clues. A drink of, say, whiskey, sends a certain quantity of ethyl alcohol into the stomach, where some of it is absorbed directly through the stomach wall and goes to the liver, and some goes down the small intestine and then to the liver. From the liver the alcohol is distributed through the blood stream to all parts of the body.

When the alcohol-laden blood reaches the brain it throws that organ out of kilter. In large enough quantities it produces slurred speech, double vision, staggering, delusions of grandeur and all the other familiar symptoms exhibited by drunks.

As the alcohol concentration increases, its effect extends to different parts of the brain. The alcohol slows down the brain's functions by a drugging action that leads to drunkenness. After absorbing about ten ounces of pure alcohol a normal man will pass out.

The widely held belief that alcohol is a stimulant is not true. It is, instead, a depressant. Any joy or exhilaration that a drinker feels after



Industry is fighting a constant battle to make its jobs safer. Rehabilitating alcoholics is part of that battle

he has downed a few quick ones is the effect of alcohol retarding the activity of the highest brain centers. This retarding acts to remove inhibitions and permits emotions to take over. A man's sense of reason is progressively dulled by increasing amounts of alcohol until in the final stages he lacks all rational and esthetic qualities.

How Much Is Too Much?

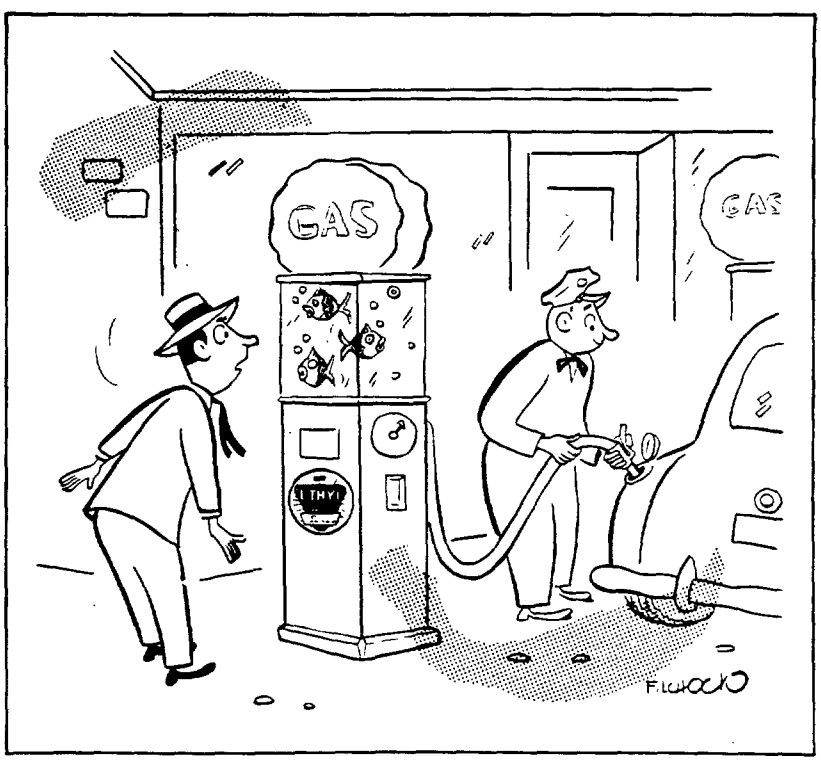
The amount of liquor that a man can drink and still remain sober depends upon several factors. They include the size of the man, how long he takes to drink a given amount, the amount of food in his stomach, and the extent of his acquired tolerance. If, after a meal, a man were to drink five ounces of 80 proof (about 40% ethyl alcohol) bourbon whiskey in 30 minutes, he would end up with little more than an ounce of pure alcohol in his blood stream. This is not enough to produce intoxication. Five ounces of whiskey contain only around two ounces of alcohol and while they are being absorbed into the system, food, especially fat food, will act as a retarding agent.

Some of the alcohol is also absorbed by the liver and eliminated.

But if the man were to keep on drinking he would reach a level of intoxication in which his liver became so taxed with its alcoholic load that instead of burning it off and eliminating it, the liver allowed it to pass on into the blood stream. In short, the amount of liquor a man drinks does not determine how drunk he will get. The governing factor is the amount of alcohol that is finally absorbed into the body fluids.

As formidable as all this may sound, medical studies do not indicate that drinking is entirely useless. On the contrary many authorities feel that a nip or two now and then to quiet squirming nerves is of definite value. Taking too much, however, is what leads to drunkenness, and its manifold problems.

Industry's new outlook treats inebriety as a symptom of something that has gone wrong with a personality. This, many authorities feel, is the first, and perhaps the most important, step in overcoming the problem of alcoholism.



THE PRESIDENT TAKES OFFICE

(Continued from Page 11)

affair in contrast to the inaugural reception of James Buchanan on the evening of March 4, 1857. A temporary building had been put up in Judiciary Square, midway between the Capitol and the White House. It is recorded that before the evening ended, the guests consumed "8 rounds of beef, 75 hams, 60 saddles of mutton, 4 saddles of venison, 400 gallons of oysters, 500 quarts of chicken salad, 500 quarts of jellies and 1200 quarts of ice cream."

Today, it's a tradition that the incoming president ride to the Capitol with his predecessor (and, since the time Mrs. William Howard Taft rode with her husband, in 1909, it has been customary for the wives to go along, too). But that wasn't always so. Legend has it that Jefferson walked alone to the Capitol from his lodgings across the plaza.

Sometimes through choice, or accident, the outgoing president hasn't been on hand for the swearing in of the new one. John Adams, weary from working long past midnight signing new appointments and clearing up White House affairs, hastily left town before Jefferson was sworn in. When Woodrow Wilson turned over the presidency to Warren G. Harding, he made a heroic effort to attend the ceremony. The stricken Wilson was driven to the rear entrance of the Capitol and helped into a wheel chair waiting to take him to the lower corridor of the building. But just before the ceremony the outgoing executive found his strength unequal to the occasion. Turning to a companion he whispered, "The Senate threw me down before, and I don't want to fall down myself now." He limped to his waiting car, to be driven back to his future home on "S" Street.

Another Rough Ride

Some of the most impressive inaugurations haven't even taken place in Washington. There was the time, in the autumn of 1901, when vice-president Teddy Roosevelt was vacationing in the Adirondacks. He was hiking in the late afternoon near the summit of Mt. Marcy when a search party found him and gave him the word of President McKinley's death. Teddy's rough-riding days were duplicated when he covered close to 500 miles by foot, horse and train in 19 hours, to be sworn in to the presidency at Buffalo, N. Y.

Just as dramatic as any capital inaugural was the simple ceremony by which Calvin Coolidge became president on an August night in 1922. It was midnight when word came to the Coolidge homestead at Plymouth Notch, Vt. that Harding had died. A kerosene lamp cast flickering shadows around the familiar sitting room as Coolidge's father, a notary public, read the oath of office. A few country neighbors stood at open doors and windows, shivering a bit in the chill night air as Calvin Coolidge became the nation's 29th president.

But this year the big event is in Washington — and many an American is out to make the most of it. This time, too, President Truman's dramatic victory at the polls betokens changes and a certain amount of political ferment as his Administration gets off to a fresh start.

Many people are in Washington this month to size up all these changes at first-hand. Some are seeking jobs, others are Truman admirers or merely curious sight-seers. Whatever their motives they share one thing in common — the desire to be part of the Big Show that happens only once every four years.

OUR COVER: courtesy of Louisiana Department of Commerce and Industry. **OUR PICTURES:** Page 8 (inset), Press Association; Pages 8-11, Culver Service; Pages 12-13, courtesy Allied Van Lines; Pages 16, 18, 22, art work by Harold Newman; Page 20 (top and left center), courtesy *Paper Trade Journal*, (bottom right), courtesy of Johns-Manville, (bottom left), courtesy *Paper Mill News;* Page 21 (bottom right) courtesy *Paper Mill News*; Page 23, courtesy Old Print Shop; Page 24, courtesy Alcoholics Anonymous.

BLUE BLOOD BOOK

Back in 1787 Mrs. John Jay, wife of the Secretary for Foreign Affairs, made public a little book entitled "Dinner and Supper List for 1787 and 1788." This is said to have been the start of the Who's Who business, which takes in the Social Registers now published in virtually every large city of the United States.

The practice was carried on in 1846 by a member of the bar who published "The Wealth and Biography of the Wealthy Citizens of Philadelphia." Then, in the eighties, came whiskered Ward McAllister's 400. Society in New York was said to have been limited to that number because it was all who could dance comfortably in Mrs. William Astor's ballroom.

Now, everybody in New York City with social aspirations is trying to get a copy of the "500" — a book that was limited to just that number. It was prepared by members of 12 leading families of Newport, and it lists 500 families as socially elite.

McAllister, who believed that only the people who did not have to work were worth anything, was once quoted as saying that when you went over 400, you met people who either were not at ease in a ballroom, or else you had to invite people who worked for a living, such as "doctors lawyers, editors, artists, and the like." Now, persons who have been privileged to look over the 500 list say it contains members of all those professions.

ETC 24008

FUEL IN THE SUN

Sitting out in the blistering sun of Southern California's lush Imperial Valley are 56 drums of experimental aviation fuels that may help determine the final composition of the gasoline that powers America's military aircraft in the future.

The drums are part of a combination laboratory-field program being conducted by Ethyl Corporation to determine the storage stability characteristics of the components of various experimental antiknock compounds and other gasoline additives. The project began seven months ago and will last two years, according to present plans.

Location of the drum storage field is near El Centro, where natives consider it a cool day when the thermometer does not go above 100 degrees. Official temperatures as high as 119 degrees are not too rare in El Centro proper, and usually it is five degrees hotter at the storage area.

Several sites were considered for the field phase of the project. Imperial Valley was selected because other gasoline storage stability work conducted there during the recent war by the Coordinating Research Council demonstrated that few, if any, locations offered more severe test conditions. The Navy Department is cooperating to the extent of supplying the storage area, but is not a co-sponsor of the project.

In a sense, the current Ethyl program is an extension of the storage stability work carried on in the Southern California desert region by the CRC. Ethyl Corporation's interest in its antiknock compound does not end with sale of the product to oil companies for use in improving the quality of their motor and aviation fuels. It is concerned with the behavior of "Ethyl" antiknock fluid at all stages of gasoline storage and use. For that reason, the characteristics of components that make up present and possible future "Ethyl" fluid mixes are under constant study. The storage project is a phase of that overall effort to produce better fuels.

Each of the 56 drums stored contains some 50 gallons of aviation fuel of 115/145 Performance Number with 4.6 ml. of tetraethyl lead per gallon added. Each batch of fuel also contains proper quantities of the various additive materials being tested.

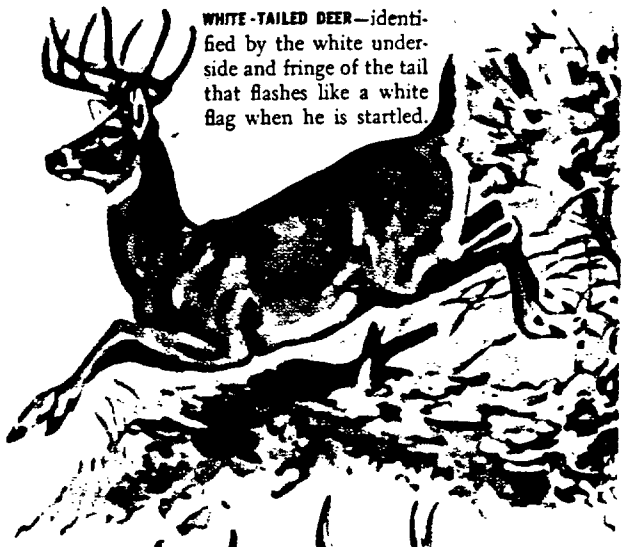
To add to the severity of the test conditions, the fuel drums have been painted black so that they will absorb and retain the maximum heat. Samples are withdrawn only between the hours of midnight and 6 A. M., when atmospheric temperatures are 35 to 40 degrees lower than in the simmering daytime. Thus, the exposure of the samples to light is avoided and the loss of fuel through evaporation is minimized.

Samples have been withdrawn for analysis at three-month intervals, and additional samples will be taken next June, at the end of one year's storage. The samples are analyzed at the Ethyl Corporation Research Laboratories in Detroit, where the laboratory phase of the storage stability project is in progress.

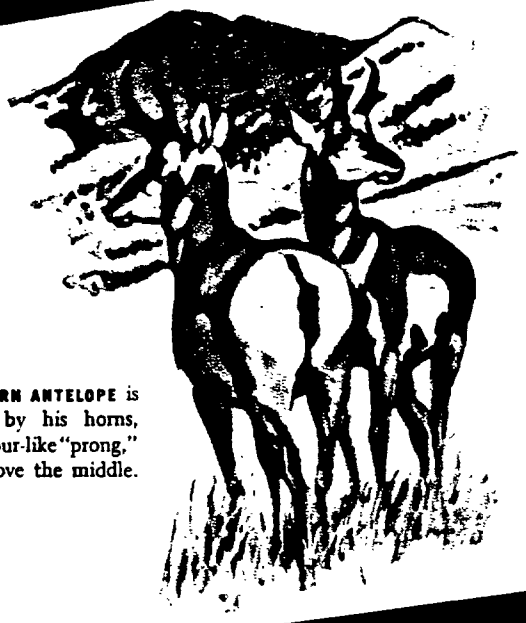
When you go hunting

THE "TRADE-MARKS" OF NATURE*

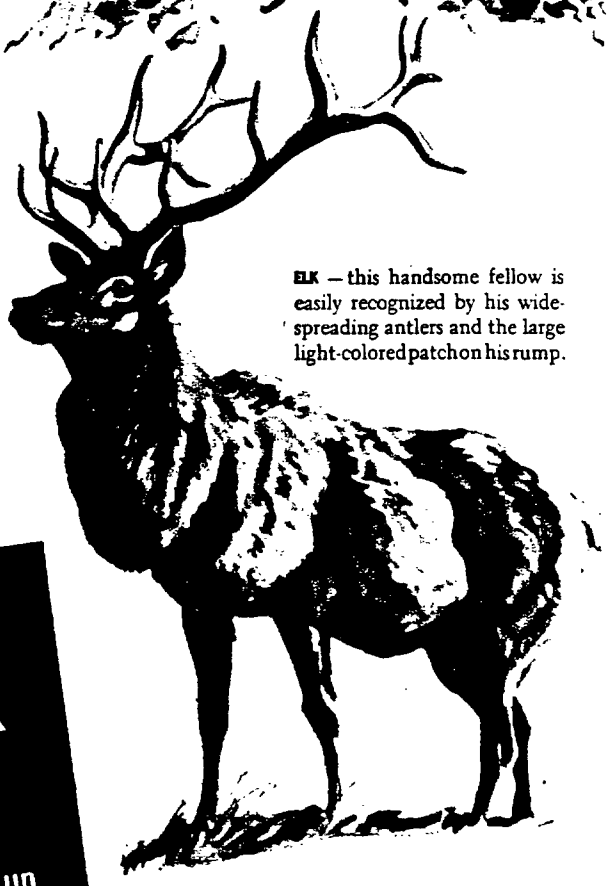
identify your game



WHITE-TAILED DEER—identified by the white underside and fringe of the tail that flashes like a white flag when he is startled.



The **PRONGHORN ANTELOPE** is distinguished by his horns, which have a spur-like "prong," or branch, above the middle.



ELK — this handsome fellow is easily recognized by his wide-spreading antlers and the large light-colored patch on his rump.

When you buy gasoline...

THE TRADE-MARK "ETHYL"

identifies gasoline stepped up with "Ethyl" antiknock fluid

The **ROCKY MOUNTAIN GOAT** is identified by a coat of long, white hair and his short and sharp, black horns.

To get the best performance from your car, use high quality gasoline improved with "Ethyl" antiknock fluid — the famous ingredient that steps up power and performance.

To show you their best gasoline contains "Ethyl" antiknock compound, oil companies display "Ethyl" trade-marks on their gasoline pumps. "Ethyl" fluid is made by *Ethyl Corporation, Chrysler Building, New York 17, N. Y.*

**Prepared in cooperation with specialists of American Museum of Natural History, N. Y. Animals illustrated are males of the species.*

ETC 24010

ETHYL NEWS

ETC 24011

FEBRUARY ★ 1949

IN THE

ETHYL NEWS

FEBRUARY 1949

One of the busiest men at the Ethyl manufacturing plant in Baton Rouge these days is William J. Henry, manager of the Engineering and Maintenance Section. Much of his responsibility centers around the progress of the company's $40 million plant expansion program, which is being pushed ahead rapidly this year.

Working closely with B. Bynum Turner, assistant manager of the plant, and general coordinator of expansion projects, Mr. Henry is giving particular attention to directing and supervising the activities of his section construction group. This group works cooperatively with the construction and contracting firms which are employed by Ethyl to build the new units.

Engineering and Maintenance also has charge of planning, design control and general engineering for all new installations, including expanded utilities. One of Mr. Henry's major interests is to see that the expansion program progresses on schedule.

Mr. Henry, a native of Pittsburgh, studied industrial engineering at Carnegie Institute of Technology and civil engineering at the University of Pittsburgh, where he received his Bachelor of Science degree in 1930. After graduation he was employed for a year at the Bayway refinery of Esso Standard Oil Co. Then he was transferred to the Baton Rouge refinery, where he became technical supervisor in charge of maintenance and construction until he joined Ethyl Corporation ten years ago.

A MESSAGE TO YOUR SON 3

The story of the advent of the automobile and what it means to America is familiar to many of us — but it takes a man like "Tab" Boyd to tell it with warmth and understanding.

KNOCKOUT POWDER FOR PESTS 8

An insecticide known as benzene hexachloride — BHC for short — is proving itself a virile combatant against many of the pests which destroy $4 billion worth of crops a year. Now being manufactured by Ethyl Corporation, the chemical is an especially useful ally of the cotton farmer.

A PAPER IS BORN 11

It may take only a half hour to present a report at a technical society's meeting, but behind the scenes lie months of experimentation, study and analysis before the author can even sit down to prepare it. Here's an idea of the work that went into a typical paper, one of some 3,000 given before various scientific groups each year.

UNIQUE RESEARCH CENTER 14

To help the Southwest realize more of the potentialities of applied industrial research, a privately endowed research center in Texas is using a novel approach to solve the problems of commerce and industry.

SHOWCASE FOR COMMERCE 18

Romantic novelists often describe New Orleans as a nostalgic place, day-dreaming on the banks of its levees — but in reality the city has grown into the nation's second largest port. Determined to expand its foreign commerce still further, New Orleans has opened an ultra-modern International Trade Mart, the first of its kind anywhere.

In order to widen the fields of reader interest in Ethyl News, we frequently publish articles contributed by writers not associated with Ethyl Corporation. Opinions expressed in signed articles are the authors'. The editors of the News welcome articles of timely interest submitted from outside sources.

Published by ETHYL CORPORATION, 405 Lexington Avenue, New York 17, N.Y.

Manufacturer of "Ethyl" antiknock compound, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, secretary

ETC 24012

A Message to Your Son

By T. A. Boyd
Research Laboratories Division, General Motors Corporation

One of the most difficult things any of us ever has to do is to tell the story of what we know, and what we believe, to a young man in such a way as to command his interest and understanding. Here is an excellent example of how one man, T. A. Boyd, did that, in an informal talk he delivered before groups of college students. It also happens that "Tab" Boyd is talking about a subject of interest to all *Ethyl* News readers. We are happy to print a portion of his talk.

THE EDITORS

YOU HAVE HEARD that the automobile has transformed life in the nation. But, because you are young enough to have been accustomed to the automobile all your lives, you perhaps cannot quite realize what things were like before it came. When I was born there was not a single automobile in the whole country. We traveled then by horse and buggy or on horseback — or else not at all.

It happens that my early life was spent on a farm in eastern Ohio. I don't suppose that you have ever seen any roads as bad as those that wound up hill and down dale in that hilly region of clay and limestone. Our roads were narrow, crooked, and mostly muddy. But we used to crawl along them on the darkest nights with no lights at all. I can still hear the mud squashing under the horse's hoofs as he toiled over those roads, and the sloshing of the mud as the buggy wheels rolled slowly through it.

The horse was so slow and unsatisfactory that the wish for a carriage to go without horses is almost as old as history. And it was while I was a boy that the long-wished-for horseless carriage finally did become a reality. Thus I had the luck to be on hand in the years during which occurred one of the most important events in all history.

People did not know what to call the motor at first. They gave it various names, including horseless carriage, motor wagon, gasoline buggy, and buggyout. But they finally settled on the French name automobile.

The automobile was not invented

ETC 24013

In reviewing automotive progress, "Tab" Boyd can speak out of rich personal experience

by any one man. It was something which came at last as an evolution. It was assembled out of elements some of which were very, very old.

The sliding gear transmission, for instance, is almost 150 years old, and the differential gear is over a hundred. The rubber tire was patented more than a century ago. As for the internal combustion engine itself, the first crude one was made before Benjamin Franklin was born. It was 125 years ago that Sadi Carnot, the Frenchman of Carnot Cycle fame, gave a full explanation of how to get high powers and efficiencies in engines. The way to do it, he said, is not by means of a steam engine, but with an internal combustion engine, of which there was none in existence at that time. That engine, Carnot said, should be designed to squeeze the charge of air and fuel to a high compression before firing it. So you see that knowledge of the need for high compression in engines is not new.

Those first automobiles of the 1890's and early 1900's were not very good, to be sure. The greatest question about them was whether they would run or not. So often they wouldn't run that their most useful accessory was a tow rope. "Get a horse!" was a common gibe of that time. When in 1899 three automobiles were purchased for the use of Army officers, it was stipulated that provision be made for hitching mules to them for towing purposes.

After a few years cars got more dependable, but they were so scarce and so costly as to be little more than a rich man's toy. It was that circumstance which caused the late Woodrow Wilson to say in 1906, when he was president of Princeton University, that "Nothing has spread socialistic feeling in this country more than the use of the automobile." The reason was, he said, that "to the country man they are a picture of arrogance and wealth with all its independence and carelessness."

But when Woodrow Wilson spoke there were a number of things he did not and could not know about the future.

He did not know that before long cars would become so plentiful that every Tom, Dick, and Harry would have one. A hundred million automobiles have now been built in the United States. There are enough cars in service today for every one in the nation to go riding at once — and on Sunday afternoons it seems

ETC 24014

sometimes that everybody has. In the nation now there are 50 million persons who have licenses to drive. The number of automobiles in service today greatly exceeds the number of horses and buggies in use in 1906.

This Woodrow Wilson could not foresee. Nor could he imagine that, because of the large increases in wealth and wages which were soon to come out of advances in technology, millions of families, who at the time he spoke could not afford a horse and buggy, would one day have much better automobiles than those he looked upon in 1906 as "a picture of arrogance and wealth."

More Power on Farms

On farms there are now so many cars, trucks, and tractors that, believe it or not, there is more mechanical power on U. S. farms today than there is in all the factories of the nation. Such has become the sad state of the country man whom Woodrow Wilson feared was turning socialist from staring at the few cars which dusted along the roads of that day. As one of those country men myself at that time – or rather, country boy – I can say in passing that some of us were worried about the way those noisy cars scared the living daylights out of our farm horses, but turning socialist was something that we did not think of doing.

What has happened since 1906 is thus the direct inverse of what Woodrow Wilson feared. But he was one of the best informed and most far-seeing men of his time. Why was it, then, that his judgment turned out to be so far wrong? It was because in this present century the research worker, the engineer, and the production man have joined forces so effectively as to transform life in the nation.

Organized experimentation in industry, which has come to be called industrial research, is a powerful new factor in the life of the nation. It is a factor which existed hardly at all in 1906 when Woodrow Wilson spoke. But, shortly after that time, research in industry began to take hold and it grew, slowly at first and then more rapidly. Just since 1920, the number of workers in the industrial research laboratories of the nation has increased from only about 7,000 then to more than 135,000 today. That is a growth of nearly 20-fold. In addition, many research institutes and about 300 universities and colleges now offer research service to industry.

I once made an analysis of industrial research laboratories in the United States which showed that about one-fourth of all of them contribute to the automobile. The laboratories referred to are either those within the automobile industry proper or those maintained by companies which serve as suppliers to the makers and users of automobiles. It is all this research and experimentation and the utilization of its output by the engineer and the production man which have made cars so much better and so much cheaper.

There is nothing I can say that could possibly give an adequate impression of how greatly the automobile has been improved over the years. Such an understanding can really come only from direct comparison – from seeing the two cars together and from driving them side by side.

The first car bought in my own family, back in the early 1920's, had a rough 4-cylinder engine. It could not well be driven faster than 40 miles an hour, so badly did the engine shake; and it was hard to hold on the road even at that speed. In accelerating capacity and hill climbing ability that car was mighty low by present standards. It had a closed body, but the roof was of coated fabric which rotted out in the rain and sun until at last it let the rain come through. The paint was baked black enamel which in the sun soon cracked and got rough and lustreless. The tires were small, the springs were hard; and the ride, particularly in the back seat, was very rough.

But research and engineering effort since that time have changed all that.

Those efforts have yielded more dependable, more powerful, more economical, lighter and smoother engines; better means of carburetion, of ignition, of cooling; greatly improved transmission; easier and safer steering devices; better and safer brakes; better springs and suspensions; and mechanical advances of many, many kinds. We have more beautiful, more comfortable, and safer bodies; better and cheaper fuels and lubricants; better and less costly tires; and a great many other improvements.

Fruits of Research

Because of all this, the present-day car is a great deal easier and more pleasant to drive. It has much better performance and speed characteristics. It is quieter, smoother, and more comfortable to ride in. And it is so dependable and so automatic in operation as to be driven successfully by people with no understanding whatever of its working mechanism.

Now I would not give you the impression that all this has come about easily – neither would I want you to think that progress in the field has come to an end at all. Such advances are made not by magic but only by hard work – and by a great deal of it.

The big improvement in the

ETC 24015

motor car over the years has come because of intensive engineering and research effort and because of the custom of the yearly model. The importance of the yearly model is that it has provided an opportunity for changes to be made frequently, which in a mass production industry like ours would otherwise have been difficult. The yearly model has thus made it possible to change by evolution rather than by revolution, and that is an accepted American way of making progress.

Every car-making company has had a staff of engineers to solve problems in the car currently being manufactured, and to make improvements in the next model. In addition, there have been research laboratories, as well as product study and process development groups, which have been concerned chiefly with improvements on a longer range basis. These latter are the "finder-outers," and the engineers in the actual car-making company are more the "getter-doners," although they find out new things, too. There is also cooperative effort between the various groups in which the commercial background of the one and the specialized abilities of the other combine to yield a solution that is commercially sound. In General Motors the total of workers in these groups is over 4,000.

All Play a Part

In addition to all these, there are those many, many men – engineers, metallurgists, chemists, and physicists – who work in the several industries which serve as suppliers to automobile makers: first, of accessories, such as spark plugs, ignition systems, carburetors, and tires; and, second, of materials of construction. Just how many engineers and other technical men contribute to the automobile through such materials as steel and other metals, and as finishes, safety glass, and rubber is not known, but it is quite large, of course.

As a concrete case history showing in more definite fashion how advances are made through research and engineering, I shall now relate a little of the story of the long battle against knock. This particular case has been selected because I have myself participated in it in a small way, and so have first-hand knowledge of the events to be related.

Knock, as you know, is that annoying engine noise which, because it gets worse as cylinder pressure is raised, keeps the compression ratio of automobile engines from being boosted as high as would be desirable. The most recent event in the investigation spoken of was the building in our General Motors Research Division of a number of automobile engines of very high compression. The compression ratio of those engines is 12.5:1, which is just about double that of present-day automobile engines. Those engines give a third more miles per gallon than a present-day automobile engine of like performance. And that large gain in economy is obtained without any sacrifice whatever in car performance or in engine smoothness.

Such a big boost in economy, when it can be attained in practice, will be very much worth while. As the consumption of gasoline in the nation is now about 100 million gallons a day, each per cent saved represents a million gallons every day of the year. And finding an oil well to yield a million gallons a day (25,000 barrels) would surely represent an important discovery.

But the building and operation of such a high compression engine was possible only because of two things. The first was knowledge of engineering and design gained by years of experimentation and experience. The second was the availability of a fuel free enough from knock to run it on. That fuel came into existence only through long years of research. And it is a brief account of that research which is now to be given.

The effort to pierce the barrier of knock covers a period of over thirty years. That is such a long time that, of course, I can do no more than brief the events of the period. "By thirty years," Mark Twain remarked once, "I mean forever." And it *is* a long time to pursue one objective, but I shall try to give you just the highlights.

The man who first appreciated that the noisy bugbear of knock is the great shortcoming of gasoline, a shortcoming which stands as a barrier to better economies, and who set out to do something about it, was Charles F. Kettering. Mr. Kettering retired as head of our Research Laboratories Division in 1947, and was succeeded by Charles L. McCuen. In 1919, speaking before the New York Section of the Society of Automotive Engineers, Mr. Kettering said the following:

> "Some three or four years ago, we started a little laboratory over home – just a sort of playhouse in which to study, from various angles, the application of fuel to an engine. We intended to do this studying in about the same spirit as a man plays golf, but I don't think we used the same proportion of profanity as is used in that game."

Of the several discoveries made in the important research which was begun in that small way, two were of outstanding importance. The first in point of time was the chemical antiknock agents. These are compounds which when added to

gasoline in extremely small concentrations suppress knock to a large degree.

The first antiknock compound discovered was iodine. Iodine is quite effective as a knock suppressor, but it is not a substance that can be used in practice. After much further searching, during which a good many other compounds were found that were effective as antiknock agents but not practical for one reason or another, the quest finally led to tetraethyl lead. Tetraethyl lead is a liquid which when added to gasoline in minute amounts, usually about one-twentieth of one per cent or less, cuts down to a large degree the tendency of gasoline to knock.

But it was found that tetraethyl lead alone could not be used in gasoline, for when burned in the engine it left solid deposits there. The effort to find a way of overcoming that shortcoming led after awhile to the discovery that the trouble could be corrected by adding a bromine compound to the gasoline along with tetraethyl lead.

Applying that discovery in a practical way made it necessary to search for new sources of bromine. It was known that bromine is present in the sea, although in very, very minute concentrations. The concentration of bromine in sea water is only 65 parts per million. That means that it takes about ten tons of sea water to yield one pound of bromine. Nevertheless the problem of getting bromine out of the sea was attacked with courage and vigor. And in time a way was found to do it. Today, about 75 million pounds of bromine are being taken out of the sea each year, the most of which goes into gasoline.

The chemical agents which influence knock are very interesting substances in that the actions of the different compounds may vary all the way from a powerful knock suppressing effect to an equally powerful knock inducing effect. Furthermore, the effectiveness of any one compound varies widely with the kind of fuel to which it is added. Thus tetraethyl lead, which ordinarily is a powerful suppressor of knock, will in some fuels of special composition completely reverse its action and become an inducer of knock. But in gasoline tetraethyl lead is an effective antiknock agent, and in a practical way it has already been employed to boost the antiknock quality of nearly 500 billion gallons of gasoline. Without it, we could not have the kind of gasoline we have today.

Second Step Forward

The second discovery of outstanding importance made in this long research was that the knocking properties of a fuel itself are determined by the architecture of the compounds contained in it. That is to say, the knocking property is determined not by the percentages of carbon and hydrogen in the compounds composing the fuel, or by their ultimate composition, but by the way in which the carbon atoms are grouped or linked together.

It was found that the worst possible hydrocarbons for giving knock-free power are those in which the carbon atoms have the straight chain grouping. Unfortunately, those are the very kind which occur in petroleum for the most part. And that is the reason why, when years ago gasoline was made by direct distillation out of petroleum, it was so low in octane number — only 50 or 55.

Thus, among the 7-carbon paraffin hydrocarbons, which are called the heptanes, the heptane with straight chain grouping is a very bad knocker. On the octane scale it is zero. If you had to run your car on that straight chain heptane you have little conception of how badly it would knock. A demonstration we used to make at the laboratory was to run an engine on normal or straight chain heptane and watch it come quickly down to a stop from the violence of the knock. If we had to use normal heptane as fuel, automobile engines would have to have a compression ratio of only about 3:1.

The best hydrocarbons, those freest from knock, it was found, are those in which the carbon atoms are closely compacted in arrangement. Thus, the most closely compacted heptane, called triptane for short, is one of the most knock-free hydrocarbons known. If our gasoline could only be made out of triptane, knock would be no problem whatever, but engines could have compression ratios just as high as desired . . . In aircraft engines, where power is emphasized more than economy, an engine operated on triptane can give ten times as much power as one running on straight chain heptane.

These and other items of knowledge which came out of the research mentioned were promptly made available to everybody. And they stimulated others to extensive researches on how to make gasolines in practice which would contain hydrocarbons of more knock-free types. This phase of the work was conducted chiefly within the petroleum industry. The result of it has been that, through improvements in thermal cracking and through such new processes as catalytic cracking, polymerization, hydroforming, and alkylation, coupled with the use of the antiknock agent, tetraethyl lead, gasoline has been greatly improved in octane number.

(Continued on Page 22)

KNOCKOUT POWDER FOR *Pests*

Benzene hexachloride, now being produced by Ethyl, gives farmers a potent weapon in their constant battle against harmful insects

EVERYONE HAS heard of such agricultural pests as the boll weevil, the corn borer, and the locust, but only a farmer can tell you how destructive they are. Insects such as these destroy an estimated $4 billion worth of crops a year — curtailing production, contributing to higher costs and hence higher prices, and depriving mankind of the full measure of food and fiber which would otherwise be available.

In cotton alone, it is estimated, the boll weevil and other pests take more than a $400 million annual toll. In 1947, marauding insects ate their way through a million and a half bales of cotton, thereby raising the cost of producing cotton an estimated 5.8 cents a pound.

To lessen, if not eliminate, the ravages of these insects, farmers today are spending around $100 million yearly on insecticides of all kinds. For their part, insecticide manufacturers are making every effort to meet the unprecedented demand for these agricultural weapons.

Besides an over-all increase in the supply of insecticides, recent years have seen growing interest in newer synthetic products, especially that group known as chlorinated hydrocarbons. Of these, one such member showing great promise is a product named benzene hexachloride (called hexachlorcyclohexane by chemists) — or BHC for short — which investigations have shown is a highly effective agent against many of the farmer's insect ene-

Drums of BHC, produced at Ethyl's plant in Baton Rouge, La., being stored in a warehouse prior to being shipped

ETC 24018

mies. Today, in view of the demonstrated versatility of benzene hexachloride, Ethyl Corporation is producing this chemical at its Baton Rouge, La. manufacturing plant, and making it available to farmers through agricultural insecticide manufacturers who convert the chemical into concentrates and into dusts ready for application.

Students of chemical history differ as to when the insect-killing properties of BHC were first discovered. Michael Faraday, the electrical wizard and chemist, first made it as a compound in 1825, but, like DDT, it lay dormant in technical files until 1941.

During that year, a French chemist noticed that BHC quickly killed clothes moths. He suggested that it be tested as an agricultural insecticide, and in 1943 a report was published in France. The official report did not reach the United States until 1946. But advance news of BHC's insecticidal properties arrived in this country a year earlier, when reports of British tests and manufacture were received.

Benzene hexachloride is made in the presence of actinic light by reacting chlorine gas with benzene, a derivative of coal tar or petroleum. The final product, BHC, is a fine white powder.

The insecticidal properties of BHC are determined by its molecular structure. The variations of the $C_6H_6Cl_6$ molecule are known as isomers, and ordinarily, BHC comprises at least five isomers which are designated alpha, beta, gamma, delta, and epsilon. Of these, the gamma isomer is by far the most deadly against insects.

BHC reacts on insects as a stomach poison, contact poison, and a fumigant. In other words, if an insect susceptible to BHC eats it, steps on it, or breathes it, the insect will die as a result. As with other insecticides, BHC will not kill all harmful insects, but when blended with other chemicals, it has proved to be effective against a wide variety of pests. Despite the deadliness of BHC to many insects, it has been found to be comparatively harmless to higher forms of life, when proper precautions govern its use.

When applied to prevent insect attack on the South's valued cotton crop, BHC controls the boll weevil, cotton aphid, cotton fleahopper, tarnished plant bug, rapid plant bug, cotton leafworm, thrip, southern green stink bug, garden webworm, and fall armyworm. With DDT added to the BHC dust, the bollworm is also brought under control, and with sulfur added, the red spider can also be successfully combatted.

The most widely used cotton dust is the so-called 3-5-40 mixture, consisting of 3% of gamma BHC, 5% of DDT, and 40% of sulfur. This balanced insecticide is effective in preventing the depredations of all principal cotton insects, when ap-

Besides combatting other destructive insects, BHC is particularly effective against the cotton aphid and the boll weevil, both of which are large-scale destroyers of the cotton crop

ETC 24019

plied as recommended by Federal and State entomologists.

In areas subject to severe insect attack, the 3-5-40 dust has, in effect, as much as doubled the cotton yield which would otherwise have been attained. To cotton farmers, an investment of five to ten dollars per acre in insecticide has returned upwards of $100 in the form of higher crop yields. Such results led Texas farmers to dust an estimated 7,500,000 pounds of BHC-DDT mixture on their cotton crop in 1948, as against 600,000 pounds in 1947 and less than 10,000 pounds in 1946, when the material was first available. Oklahoma's 3-5-40 dust consumption grew from 1,650 pounds in 1947 to 1,090,000 pounds in 1948.

Interestingly enough, through the use of cotton insecticides, food as well as fiber is saved. This becomes apparent when it is realized that cottonseed oil and cottonseed meal – two "byproducts" of cotton – are used to make margarine and vegetable shortening as well as a livestock feed.

The National Cotton Council estimates that in 1946 – when cotton insects destroyed 15.1% of the entire crop – universal use of insecticides could have saved enough cottonseed oil to make over 200 million pounds of margarine and enough cottonseed meal to have served as the protein source for producing 178 million pounds of beef. Thus, the control of insects attacking cotton, as well as those that infest food crops, has a direct bearing on the problem of human nutrition.

BHC is poisonous to many insects other than those attacking cotton.

The many insects which entomologists have found to be controlled by this chemical are too numerous to be listed here. They do include, however, such diverse pests as locusts or grasshoppers, termites, ants, various fleas, a number of kinds of beetles, various mosquitoes, wasps, houseflies, ticks, lice, mites, many kinds of aphids or plant lice, wireworms, the sugarcane borer, the onion maggot, the corn lantern fly, the gladiolus thrip, and the turnip aphid.

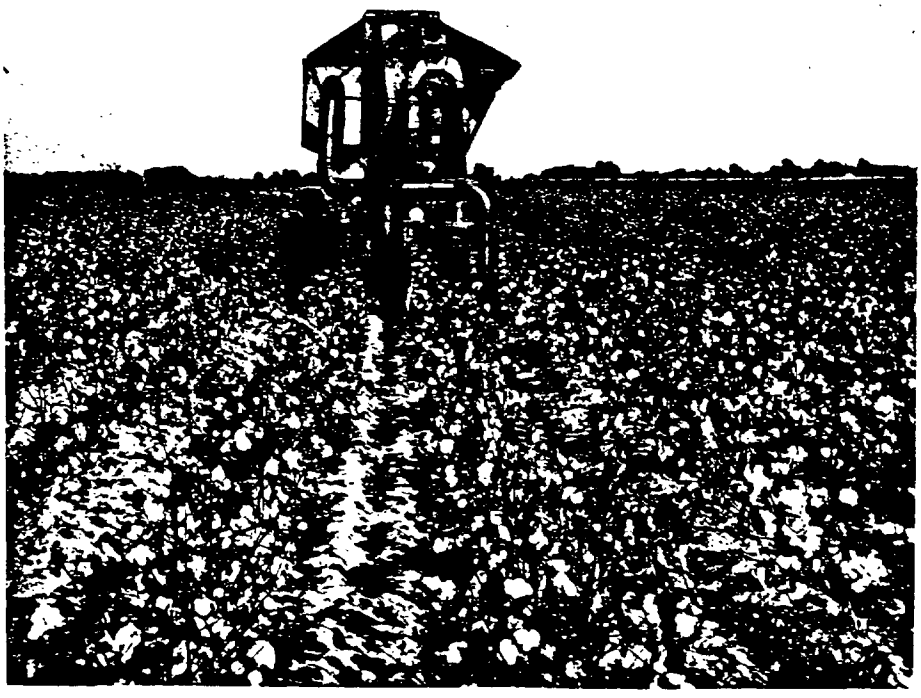
Growers of livestock and various food crops are cooperating with the U. S. Department of Agriculture's Bureau of Entomology and Plant Quarantine, various State Agricultural Experiment Stations, canners, toxicologists, insecticide manufacturers, and other groups to determine how BHC and other new insecticides can be used most effectively and safely in protecting livestock and food from destructive insects.

Ethyl's ability to produce benzene hexachloride arises from the diversified nature of its manufacturing operations.

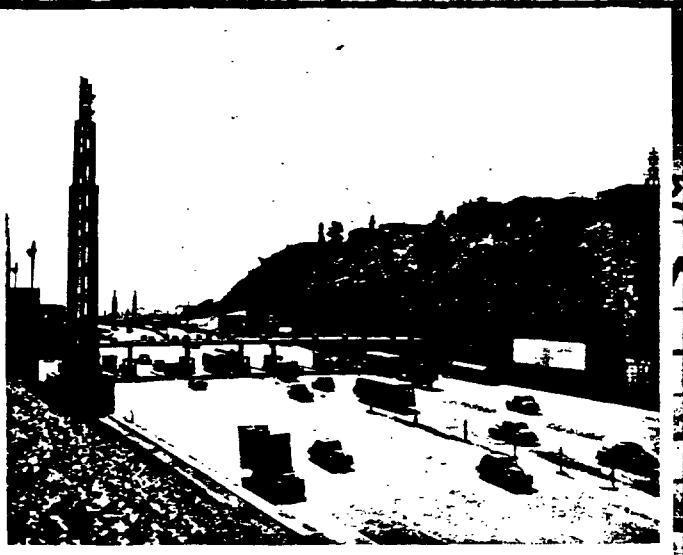
In order to manufacture "Ethyl" antiknock compound, the Corporation's principal product, a number of basic chemicals must first be made. These include chlorine, sodium, and ethyl chloride, with such other products as salt cake arising as byproducts during the manufacturing steps. The manufacturing requirements of "Ethyl" fluid are so large that the Corporation has become, as a result, a leading producer and marketer of many of these intermediate chemicals.

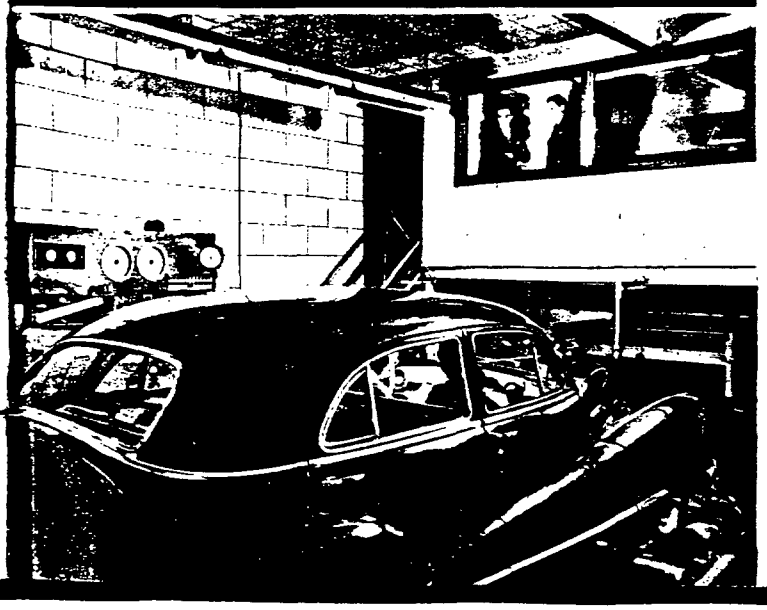
Thus, in entering the manufacture of benzene hexachloride, Ethyl Corporation is simply adding another chemical to the number already being sold under the "Ethyl" trade-mark. But more than that, the Corporation is entering a field in which it hopes to be of valuable service to farmers throughout the cotton states in their battle against destructive insects.

Unchecked, the boll weevil and other pests eat their way through 1½ million bales of cotton annually, causing an estimated $400 million loss



A PAPER IS BORN





Unknown to many people is the prodigious amount of research work that lies behind a technical paper. Here's an example

PROBABLY NO ONE knows exactly how many technical papers are introduced at meetings of the Society of Automotive Engineers, the American Chemical Society, and other scientific organizations each year — but the number is no less than 3,000.

Even so, statistical-minded Americans — who can't appreciate the magnitude of an undertaking unless the results are figuratively stacked against the Empire State Building

Seeking to develop a new engine warm-up test method, Gulf research personnel (above left) conferred often to establish the types of fuels to be used in the tests . . . Countless "runs" were made on this chassis dynamometer at the Gulf laboratories, using different types of motor fuels

Gulf engineers discussing curves plotted from the results of the dynamometer tests. The data obtained established the accuracy and reproducibility of the new method, but a wide difference in the performance of cars during the warm-up period was noted

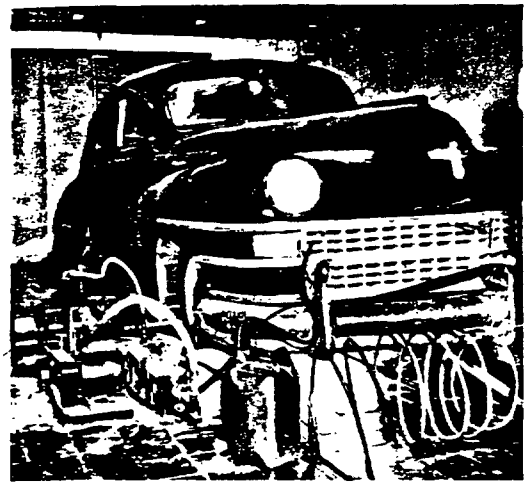
— wouldn't attach much worth to the annual outpouring of technical papers. At best, 3,000 such reports would make a pile only about 30 feet high or would stretch not quite half a mile.

But to men and women of the sciences, technical papers have a value that cannot be measured by any statistical gauge. They are the medium of communication by which scientists and research workers advise each other, and keep themselves advised, on the progress of their common effort to promote a better civilization. They are the open door through which passes knowledge that might otherwise remain unavailable to the many.

Technical papers don't just happen. Neither are they produced overnight. Behind every paper — be it one man's opinion or the findings of an entire research laboratory — lie months, often years, of diligent study, experimentation and analysis.

Consider, for example, a 1948 report entitled "A New Approach to the Evaluation of Fuel Volatility and Associated Engine Variables." Together, it and the project upon which it was based required 18 months. The behind-the-scenes activities that culminated in presentation of this technical report before the SAE in French Lick last June

When the advent of summer threatened curtailment of the chassis dynamometer work at the Gulf laboratories in 1947, Ethyl representatives (at left side of table, picture above) offered the use of the "cold room" facilities at Ethyl's Detroit research laboratories to continue the project . . . Left, J. E. Taylor, of Gulf, and Harold J. Gibson, of Ethyl, who co-authored the final paper



Above, one of the test cars on the chassis dynamometer in the Ethyl Laboratories' cold room. Some 500 test runs were made, and over 60,000 engine operating temperatures recorded, during the joint Gulf-Ethyl project . . . Right, engineers in heavy protective clothing stand by as a test car is driven from the cold room

are highlighted by the accompanying photographs.

The paper reported a new engine warm-up test method which was developed at the Gulf Research Laboratories, located about 15 miles from Pittsburgh, and which Ethyl Corporation helped to perfect by providing laboratory facilities and part of the manpower for hundreds of low temperature test runs. J. E. Taylor, assistant chief automotive engineer of the Gulf Research & Development Company, and Harold J. Gibson, an Automotive Products research coordinator at the Ethyl Laboratories in Detroit, co-authored the report.

The new technique of evaluating car warm-up is based on the belief that the average car owner is more interested in the performance of his vehicle during the warm-up period than in the length of time required to attain fully warmed-up performance. Thus, the test procedure attempts to express the "driver feel" of the car in terms which can be compared on a sound technical basis.

Three automotive manufacturers are known to have employed the warm-up test already, and one oil magazine has cited it as "proving an important tool for use by both refiners and engine designers in evaluating gasoline volatility in terms of actual engine performance."

Thus was born a typical technical paper. The Gulf-Ethyl report gives promise of being useful to the industries directly concerned with promoting ever-better automotive transportation. The 2,999 other technical papers offered last year were of corresponding value in their respective fields of interest. Each was a new milestone on the road of technological progress.

Laboratory findings were checked with actual highway experience. Both Gulf and Ethyl used road research fleets to supplement the results obtained from the dynamometer tests

ETC 24023

Unique
RESEARCH CENTER

Applying the benefits of industrial research to the problems of the Southwest is the aim of this three-way research team

Tom Slick realized a boyhood ambition when he founded his group of research organizations

WHEN TOM SLICK was a student at Yale, he was deeply interested in industrial research. While majoring in biology at the university, he became acquainted with the work being done by leading organizations in the East and Mid-West, and he was deeply impressed. Why wouldn't it be possible, he asked himself, to undertake comparable research work back home in the Southwest?

In particular, Tom wanted to do three things when he returned home from college.

He wanted to help frustrated inventors get a start. He wanted to see business organizations, large and small, tackle research problems long dormant. And he wanted to see original research work undertaken which would be of particular benefit to the Southwest, where the mesquite tree, for example, is as much a bane to mankind as cotton and oil are a boon.

Today at 32, Tom Slick is known not only as the son of one of the most famous oil wildcatters in history, as a prominent rancher in the state of Texas, and as a notable oil producer in his own right. He is also the sponsor of three unique scientific organizations. These three institutions, located in San Antonio and Houston, can point to substantial progress in their brief span of years. For example, through research and development work undertaken by them, a number of promising mechanical devices are coming along.

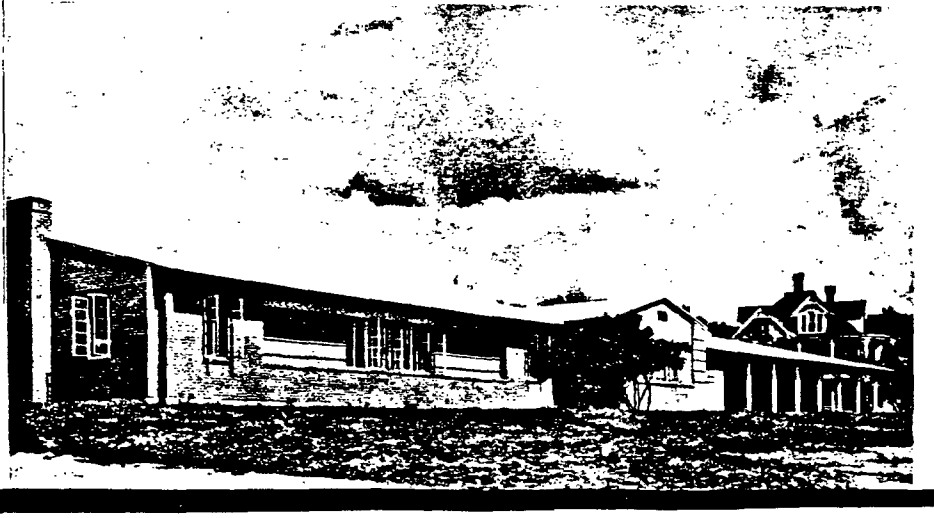
Novel Inventions

One is a hydraulic tree puller that can lift trees up to eleven inches in diameter right out of the ground, roots and all. Another is a "bump gate" which, when nudged by a car, will spring open and automatically close after the car has passed through. Still others are a directional lawn sprinkler soon to be marketed and a hydraulically operated device for demounting airplane tires. In addition, one of the research organizations helped develop a novel coin-operated bottle opener (for use at roadside stands and service stations), while another is assisting in the development of a new mechanical cotton picker.

Besides projects of a mechanical nature, one of the institutions is specializing in research related to agriculture, chemistry and medicine.

One of this latter organization's projects involves a new approach in the battle on cancer. Another is a search for new antibiotics similar to penicillin. Still another is a specific quest for a more positive method of combating brucellosis, or Bang's disease, in man and cattle. Through an arrangement with nearby Essar Ranch, which is owned by Mr. Slick, the research organization makes use of the ranch's resources for its continuing work on livestock improvement and the development of more effective preventives and cures for cattle diseases.

The three institutions, all endowed by Mr. Slick, are the Foundation of Applied Research, the Institute of Inventive Research, and the Southwest Research Institute, and they were respectively organized in 1940, 1946 and 1947. The Foundation devotes itself to long range biological studies. The Institute of Inventive Research, called "the Institute" for short, aids inventors in developing their inventions without any original charges.



This laboratory building of Southwest Research Institute was opened a year and a half ago in San Antonio, Texas

"Southwest" conducts research projects for industry on a cost basis.

In establishing these institutions, Mr. Slick's central idea was to create a new regional research center devoted primarily to industrial problems. The Southwest already boasted of some fine research organizations, for the most part sponsored by institutions of higher learning. But by supplementing, on a non-competitive basis, these existing research facilities, Mr. Slick felt that his new research center could materially aid in the development of the Southwest by concentrating on problems of particular interest to commerce and industry.

Thus, in creating his new research center, Mr. Slick patterned it after leading organizations in the East and Mid-West. In fact, his Southwest Research Institute is laid out along the lines of such organizations as the Mellon Institute in Pittsburgh, the Battelle Memorial Institute in Columbus, and the Armour Research Foundation in Chicago. More than that, Mr. Slick brought in able men to staff the several research organizations and direct their activities.

In over-all charge is Dr. Harold Vagtborg, president of Southwest Research Institute, who formerly directed the Armour Research Foundation and more recently established the Midwest Research Institute at Kansas City. Assisting him is Dr. John V. Pennington, who was formerly vice president in charge of research for a Houston tool manufacturing company, while W. H. Hammond, formerly treasurer for the Armour Foundation, serves as business manager and treasurer.

Other staff members or consultants include Dr. H. C. Dyme, chemist and bacteriologist; Dr. John B. Loefer, biologist; Robinson Brown, mechanical engineer and specialist in oil well drilling equipment; Dr. Judson S. Swearingen, chemical engineer and specialist in hydraulics and turbines; Dr. F. W. Bieberdorf, botanist and isotope specialist; Dr. Paul A. Keeses, veterinarian; I. O. Gilbert, specialist in electronics and machine design; Wayne A. Kalenich, scientific research librarian; Maurice Holland, consulting authority on industrial research; Victor A. Schoffelmayer, consulting chemurgist; A. J. Baxter, inventions specialist; and Reece Hatchitt, market analyst and sales director.

Biological Studies

The oldest of the three institutions, the Foundation of Applied Research, was given a free hand from the start to investigate any field of scientific inquiry which gave promise of yielding practical benefits to mankind. In the nine years it has been in operation, the Foundation has been conducting many long-range biological studies. These projects include programs in cancer research, artificial insemination, cattle cross-breeding, ova transplantation, antibiotics and allergenic extracts.

One of its present projects came about when some laboratory rats, stricken with cancer, also developed pneumonia. Most of the rats died, but among the few who survived it was noticed that the cancer's growth

Left, taking a sample of blood from a test animal during the course of a research project . . . Right, one of the long-range biological studies being conducted concerns allergenic extracts

had been modified in some instances. On this slim lead, a full-time biologist and his assistants are conducting hundreds of tedious tests to determine the effect of this particular type of pneumonia upon this particular type of cancer.

Another broad field of investigation has centered around livestock improvement. Seeking to develop a breed of cattle well suited to subtropical regions, the Foundation crossbred Brahman cows of excellent conformation and hardiness to champion Aberdeen Angus bulls. The resulting hybrids are said to be promising from the standpoint of weight and uniformity of color and type. In a related project, artificial insemination in the registered Hereford and Aberdeen Angus herds of Essar Ranch made it possible to breed a greater number of cows to selected outstanding bulls. In addition, plans are underway to develop new and improved breeds of dairy cattle by crossing milking strains of Brahman cattle with established dairy breeds.

The Foundation, moreover, is seeking to improve native grass crops, on the one hand, and is investigating foreign grasses, legumes and plants which might be adaptable to the soils and climate of the Southwest, on the other. It is investigating the chemurgic potentialities of such native woods as mesquite and cedar, and plants like the cactus, and is seeking fast growing types of trees which might serve as sources of pulp, paper, plastics and chemicals. More than ten thousand trees of numerous varieties have been planted as part of its forestry project.

Second among the Slick-endowed foundations is the Institute of Inventive Research. Its avowed purpose is to furnish a comprehensive service to inventors at no initial cost to them, thereby helping, it is hoped, to develop processes and products which might otherwise be neglected or abandoned. Its services to inventors include every aspect of development, patent search, engineering search, and marketing. If the invention is successful, the inventor shares the proceeds with the Institute on a basis previously determined by contract; if it yields no profits, the Institute's services cost the inventor nothing.

To date, more than 6,000 inventions have been submitted to the Institute for consideration. Of these, however, only 16 have been deemed worthy of development.

One of these is the hydraulic tree puller, previously mentioned, and which can be attached to a farm tractor for locomotion. Useful in clearing land, the tree puller, it is hoped, will prove to be particularly effective against the scourge of the mesquite. These trees, which cast no shade and provide no forage for cattle, grow rampantly, and unless they are removed roots and all, a new growth quickly springs up. At present, a full-sized model of the tree puller is slated to undergo extensive field tests by the Institute.

Directional Lawn Sprinkler

Another interesting invention is a directional lawn sprinkler that can be set to sprinkle at a 90 degree angle, or at any other angle, to cover a given area. The two inventors who thought it up had gotten tired of seeing their previous lawn sprinklers wash away the gravel in their driveways while watering the lawn. The new sprinkler has been licensed to a manufacturer of garden tools who intends to introduce it this Spring.

Still another invention was born out of a man's annoyance at having to stop his car at a gate, get out and open the gate, drive through, stop his car, go back and close the gate, and then drive on. The result is a novel bump gate which springs open when nudged by the car, and swings back and closes itself.

This hydraulic tree puller, which can uproot trees up to 11 inches in diameter, was developed by the "Institute"

Once again, a mechanic employed at Slick Airways got tired of having to run a truck over huge airplane tires to break the bead, in order to dismount the tire. His inspiration is a hydraulic operated airplane tire dismounter. Manufacturing rights to the dismounter are now being offered to airplane accessory and tire manufacturers.

Only recently, the Institute announced a new seismic method for use in exploring for oil. The method, developed by Dr. Thomas C. Poulter, is intended to develop better information as to the nature of underground strata, thereby facilitating the search for possible oil-bearing formations. In one form, the Poulter method employs a pattern of small, specially shaped explosive charges which are detonated above the ground as contrasted with conventional methods of firing a single, large charge in a shot hole at various depths beneath the surface. Although the Poulter method is still

in an experimental stage, it will, if completely successful, eliminate the drilling of shot holes in seismographic work, permit greater speed in the seismic mapping of given areas, and allow seismic exploration in areas presently not suited to it, according to the Institute.

Southwest Research Institute, which was formed two years ago, was set up to provide large and small business firms with full-fledged research service on a non-profit, cost basis. The Institute undertakes technological problems and projects under contract for a fee, and all findings of patentable discoveries automatically become the sole property of the sponsoring company or individual.

Southwest, like the Institute of Inventive Research, concerns itself largely with projects of a confidential nature. Currently it has some $75,000 worth of contracts on its books, underwritten mostly by corporations seeking to improve their products.

One recently completed project can be mentioned.

It seems that a San Antonio business man became interested in soft drinks as merchandised by roadside stands. He noticed that a motorist, say, would stop at a service station, and while his gasoline tank was being filled, would walk over to the ice chest and help himself to a bottle of pop. Sometimes, though, he would forget to pay for the drink, or the busy service station attendant would forget to ask him about it.

So, the San Antonio business man took his problem to Southwest, and the result was a very practical, though humble, invention. Now, after the motorist helps himself to a bottle of pop, he has to take it to a coin-operated device which opens the bottle in return for a nickel. The bottle opener then recesses until the next customer comes along, nickel in hand.

Research in Oil

For a group of research organizations founded on oil, it is to be expected that they should be devoting their efforts, in no small measure, to furthering oil's technological progress. For example, approximately one-fifth of all the inventions accepted by the Institute for development concern oil exploration, development and production. Currently, Southwest Research Institute, with a laboratory in San Antonio, is negotiating for a site in Houston where it intends to construct a laboratory to be used largely for research in petroleum.

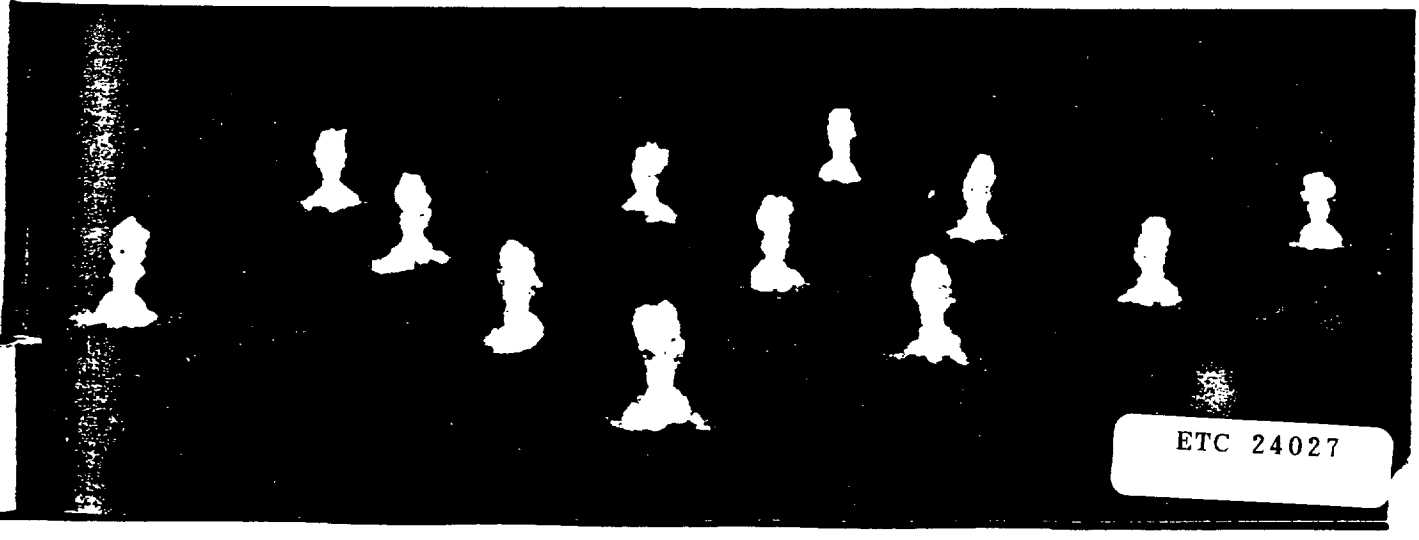
Tom Slick, who has seen his boyhood dreams come true with the establishment of this new research center in Texas, was born in Clarion, Pa., but spent his childhood in Oklahoma and Texas. And it was there, in the Southwest, that his late father made his important oil discoveries during the 1920's and 1930's.

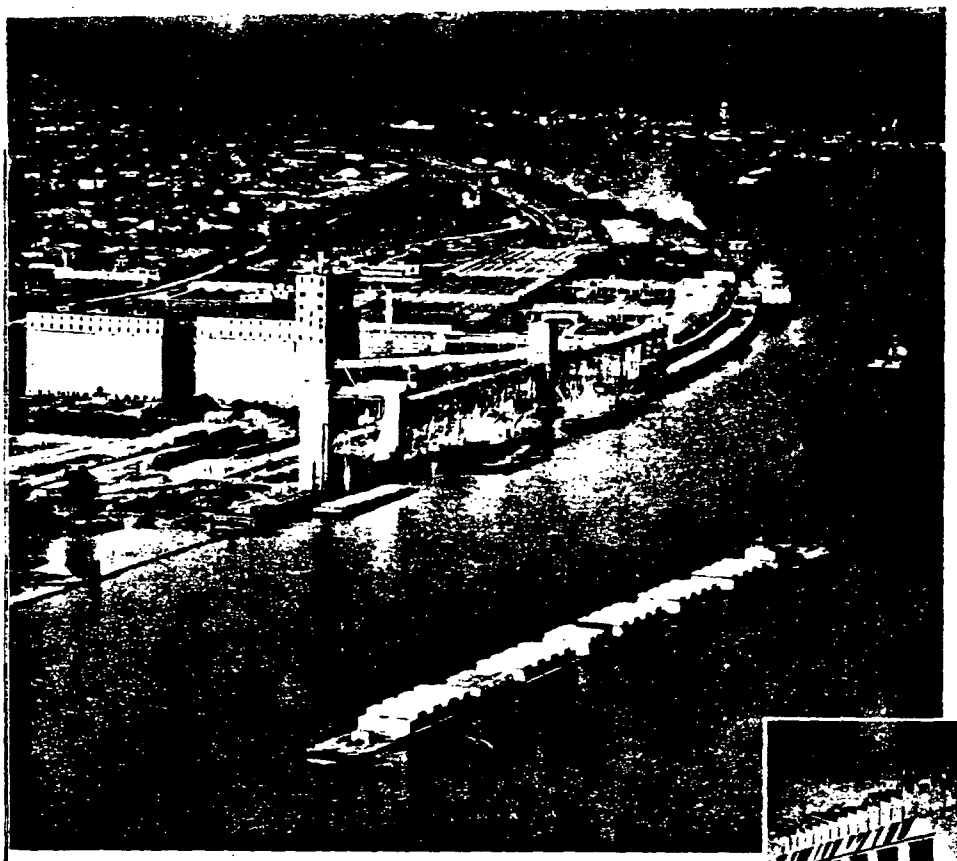
Upon completing his education in the East, Tom returned to Texas in 1938, and a year later formed the Slick Oil Co. together with his brother, Earl. The brothers are also interested in the Slick-Urschel Oil Co. in company with Charles F. Urschel, Sr., their stepfather. Mr. Urschel, incidentally, had been the elder Mr. Slick's partner for many years, and he became the boys' stepfather when he married Mrs. Slick some years after her husband's death.

While Tom devoted his business career to oil and cattle, Earl went on to pioneer a new air freight service in Slick Airways. Today, that airline is the largest of its kind in existence. Tom, meanwhile, gained national attention late in 1947 for his part in completing the discovery well in the new Benedum field in west Texas.

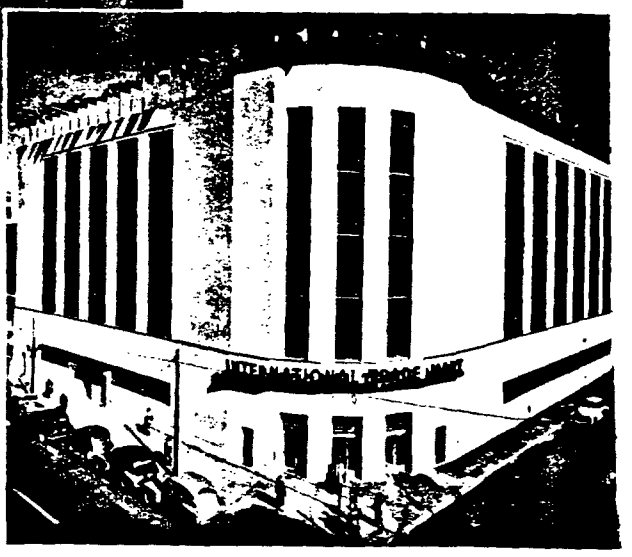
In watching his research center take root and grow, Tom Slick has seen more than the fulfillment of a personal ambition. He sees in it another means whereby the Southwest may realize even more of its potentialities than at present. The Southwest's natural resources have made it great. Applied industrial research may make it even greater.

Twelve explosive charges going off simultaneously during a demonstration of the Poulter method





SHOWCAS FOR COMMERC



The Trade Mart, right, is streamlined and modern. A Free Trade Zone, above, has helped New Orleans become the second largest seaport in the U.S.

IF YOU THINK of New Orleans only as the place where they hold the Mardi Gras, or merely as the city where famous French restaurants excite the appetites of gourmets, you are a good deal behind the times. In fact Thomas Jefferson foresaw the real future of this picturesque metropolis as long ago as 1803, when he predicted that New Orleans would become a "mighty mart of merchandise brought by more than a thousand rivers" from all parts of the world.

Time was when New Orleans slumbered beside the banks of its levees, basking in nostalgic dreams of yesteryear. But a group of New Orleans business men, sparked by the new tide of commercial enterprise characteristic of the New South, determined a few years ago that their city should really go places.

With New Orleans facing the rich potential markets of Latin America, and with the entire Mississippi Valley as its source of supply, they reasoned that their city should logically become a permanent focal point for the development of a greater peacetime foreign trade. Looking at it from the standpoint of New Orleans alone, every 10,000-ton freighter warped into the docks along the river means about $100,000 to the Crescent City.

Today, New Orleans has translated its foreign trade ambitions into a working reality which has other ports, especially in the East and North, looking at their lusty Southern rival with something very close to covetous alarm. Seventy percent of the city's income comes from the port. In 1947, the last year for which complete figures are available, exports from New Orleans totalled $923 million and imports $340 million, an increase of 68% over the city's total trade volume in 1946, the previous peacetime high. Only New York had a greater dollar volume of water-borne foreign commerce.

The latest addition to New Orleans' already well-established foreign trade enterprises – and typical of the long-range policies being developed by business leaders of the community – is the city's new

ETC 24028

Combining the new with the old in merchandising, New Orleans' unique International Trade Mart helps to sell the world's wares

International Trade Mart. Sponsors of this unique establishment are more than a little cheered by the results of its first few months of operations, and are already talking about expanding its facilities.

Opened last July and dedicated in November, the International Trade Mart is a kind of 20th century marketplace for the wares of North and South America, Europe and the Far East. In many ways it combines the idea of the older European fair —where buyers from many nations convene for a few weeks each year —and the modern domestic merchandise marts of this country, like the ones in Chicago and San Francisco. The whole idea of the Trade Mart is to make international exchange of goods easier for buyer and seller alike.

Here foreign countries, without having to spread their efforts over many mid-continent cities, can concentrate their goods for the buyers of the United States to see. And in the same building, mid-continent concerns with merchandise to sell display their products to visiting buyers from other countries. The project is the first of its kind anywhere, but it may very well induce other ports to follow the example of New Orleans.

Much of the initial success of the International Trade Mart hinges upon the simple fact that its appeal touches fundamental human nature when it comes to buying habits.

Seeing for Themselves

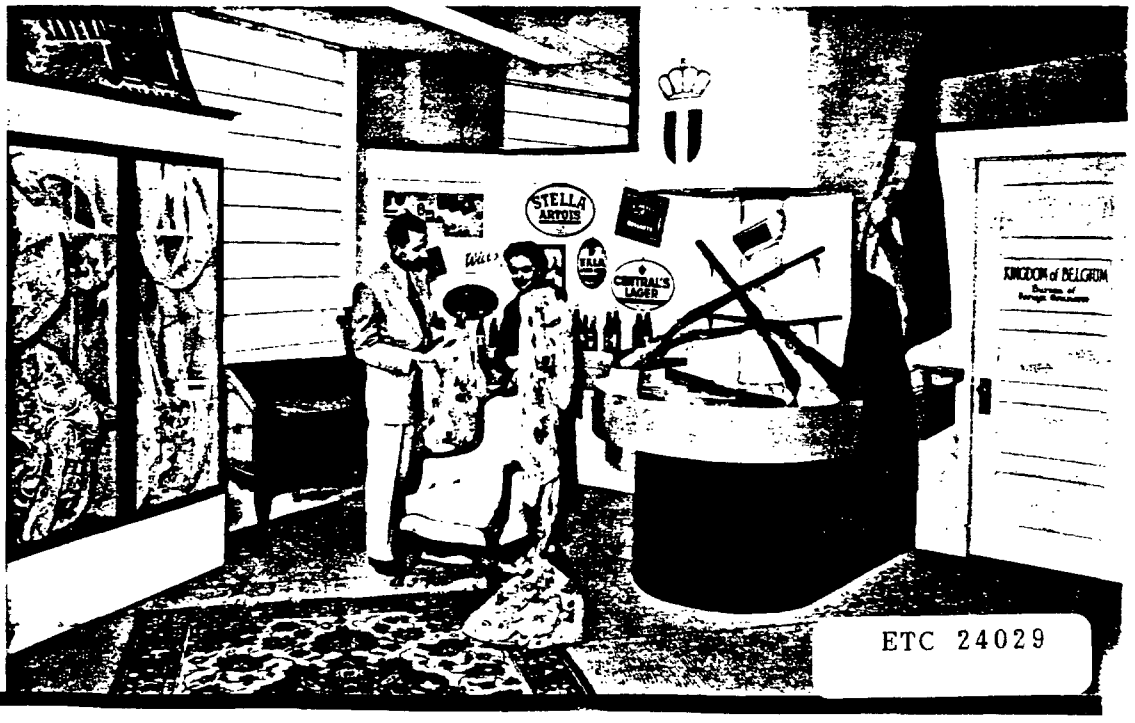
People usually prefer to see, examine and ask questions about what they are going to buy, whether their purchase is from a local supplier or from a foreign country. Now they can get the same firsthand satisfaction from Nicaraguan goods displayed at the Trade Mart as from products seen at some wholesale house around the corner in the buyer's own home town.

The Mart, too, has capitalized on the well-established merchandising principle that goods should be attractively exhibited in order to interest purchasers. The five-story $1.5 million building in downtown New Orleans is streamlined and modern and air-conditioned throughout. Spacious corridors, liberal use of plate glass and glass brick, indirect lighting and pastel colors have provided tenant companies with ideal settings and backgrounds for modern display techniques. On some walls there are murals of agricultural, mining, manufacturing and trading scenes.

Like other projects designed to boost foreign commerce for New Orleans, the International Trade Mart is a civic undertaking in a very real sense.

The community had already benefited from earlier trade development programs, starting in 1940 with the establishment of the Port of New Orleans Authority. People had given their support and contributed their dollars in 1945 towards International House, an agency to help promote better commercial relationships. When business leaders decided to establish the Trade Mart as a working partner of International House, funds were again subscribed not only by banks and insurance companies, but by the citizens of New Orleans as well.

Like International House, the Trade Mart was built as a non-profit institution. It operates entirely as a tax-free wholesale trading center, conceived and founded by civic



Belgium was the first foreign nation to open an exhibit at the trade center. Here a buyer is looking over some rare tapestries. Other goods available include laces, guns and Belgian beer

enterprise. Rents are moderate and are used only to help meet operational and maintenance expenses.

This is how the Trade Mart works:

Let's say, for example, that you are a dealer in hardware, and you live in Caracas, Venezuela. You decide to make a trip to the United States to see what different manufacturers have available. Ordinarily you might have to spend several months in this country visiting manufacturers in a good many states before you could get what you wanted. Your search is likely to be much simpler, however, if you go to the Trade Mart first.

Here there are show rooms where a number of hardware manufacturers have offices and displays. If you cannot find what you need from these companies, at least your trip to other points can be shortened to include only those plants not represented at the Trade Mart.

Possibly you're in the home furnishings business in the Mid-West, and you want to add South American pottery to your line. Instead of traveling all the way to Guatemala, Ecuador and Peru, you can go to New Orleans and make selections from the wares of Latin American firms with displays at the International Trade Mart.

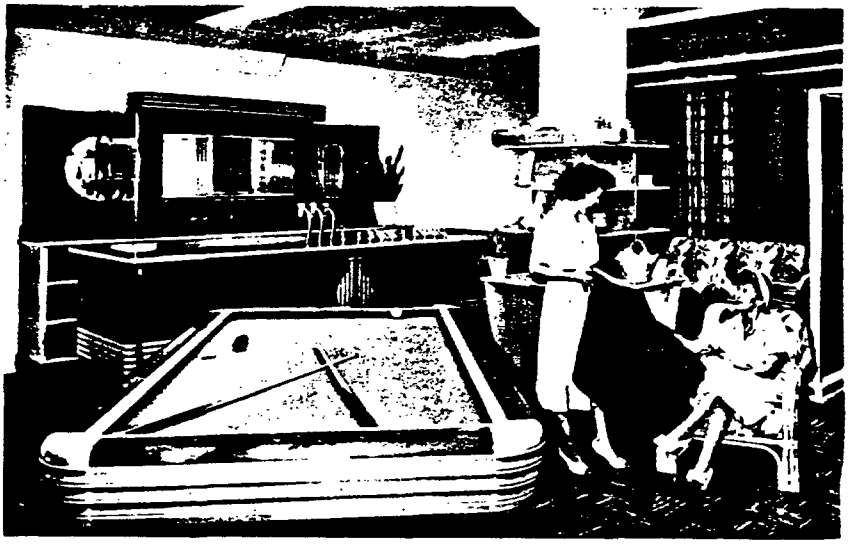
The convenience of the trading center also holds true for concerns which want outlets in the United States. Instead of attempting to establish offices or show rooms in a number of different places, firms can concentrate on the Trade Mart as a single focal point where American buyers may be contacted. Individual firms, of course, have to do their own spade work to develop business, but the Trade Mart and other New Orleans agencies like the Association of Commerce lend a helping hand.

All told, the Mart has displays by more than 400 different American manufacturers from 34 states, and by 100 foreign concerns from 22 countries overseas, 14 of which are Latin American nations. Trade Mart officials estimate that by midsummer there will be at least 500 American firms represented, and close to 175 foreign exhibitors. Before the first year of operations is over, tenants of the "world market place" will sell somewhere between $5 and $7 million in goods of all kinds. This, the Trade Mart sponsors believe, is a modest but gratifying beginning for an enterprise with no international precedents to go by.

The list of goods for sale at the Trade Mart, however, already reads almost like a manufacturers' directory. You can buy, for example, animal pharmaceuticals, encyclopedias, clocks, hosiery, lawn mowers, office safes, portable sawmills, refrigerators, safety equipment, tricycles, venetian blinds and welding apparatus. For sleek Latin American caballeros, one company offers a full line of hair tonics. American-built bird cages are in popular demand in Brazil— and you can buy Brazilian canaries at the Trade Mart, too.

The automotive and petroleum industries are among those well represented. Companies handling car and truck accessories, valve and piston grinding machinery, tires, auto parts and service station equipment have show rooms and offices. Eleven different firms, with an interest in developing business at Latin American oil fields, are displaying drilling and field equipment of various kinds.

Diversity of goods and tenants is one of the basic policies of the Trade Mart. Although more space is taken by American firms than by foreign ones, the center lives up to its international ambitions by limiting the proportion of domestic companies. All exhibitors must show only goods available for immediate import or export in order to avoid any museum tendencies. No one company is ordinarily alloted more than approximatey 1,000 square feet of floor space, so there will be room for the greatest number of occu-



Sporting goods and other equipment for leisure time use are among the wares displayed for prospective customers

pants for the Mart's 80,000 feet of available accommodations.

Based upon its experience so far, and upon surveys by such agencies as the Federal Reserve Bank of Atlanta, it is apparent that the International Trade Mart and its affiliated International House play a particularly useful role for domestic and foreign companies either too small to have special foreign trade departments, or for companies new in the import-export business.

The Trade Mart and International House are prepared to guide the stranger around any corner of the maze. If a buyer from Rio cannot speak English, he can obtain the services of a bi-lingual secretary or translation expert. International House has a Research Department where an exporter can find out about the demand for razor blades in Chile, or the kind of electric current used in the Philippines. Consular offices and freight forwarding agents have offices in the $1 million International House building. The agency's Development Department takes credit for introducing more than 2,000 American firms into the mysteries of foreign commerce.

New Orleans believes commerce can be pleasant as well as profitable.

Many a deal has been settled in the spacious lounges, suites and other club facilities of International House, and in the leisure hour rooms of the Trade Mart. Such organizations as the Port of New Orleans Authority, the Association of Commerce, the New Orleans Traffic and Transportation Bureau, the Board of Trade, the Cotton Exchange and other groups are as quick to make a dealer's stay in the city enjoyable as they are interested in helping him conduct his business affairs.

Certainly one of the most important inducements to the development of overseas business through the Port of New Orleans is the city's International Free Trade Zone. One of the three sole free trade areas in the United States, the zone was established in 1947 to permit firms to import goods duty-free for transshipment to other countries. Argentina has recently announced plans for spending over $200 million for processing and cold storage plants within the zone.

One of the most direct methods for developing the city's commerce is the way business men are attracted to New Orleans in the first place. Like Renaissance Venice, New Orleans has stationed "trade ambassadors" in foreign ports to encourage shipping into and out of the Crescent City. At home, New Orleans has a corps of representatives throughout the country, busy developing trade through the Louisiana port.

Circumstances, of course, have helped New Orleans win her present position as the nation's second largest port, with a pick-up of $1 billion in total trade volume since 1940. Favorable freight rates have brought long trains rolling into the city's eleven miles of modern docks in increasing numbers. Nature has given New Orleans an ideal trade location and all-weather harbor.

The core of New Orleans' success, however, lies more in its enterprise than in its luck. Its practical accomplishments tell the true story of its growth and progress.

Buyers can obtain the services of a bi-lingual secretary without cost from the Trade Mart or International House

Opening the Mart, Manager Clay Shaw, left, gets a key

A MESSAGE TO YOUR SON

(Continued from Page 7)

Within the decade from 1930 to 1940, the average octane number of regular-grade gasoline went up from only 60 to about 75. At the end of that 10-year period, regular-grade gasoline was freer from knock than premium gasoline had been back at the beginning of the decade. During that same period, automobile makers on their part took advantage of the better gasoline as it came along to boost the compression of automobile engines. Compression was raised gradually from a ratio of only 4.5 on the average to about 6.5.

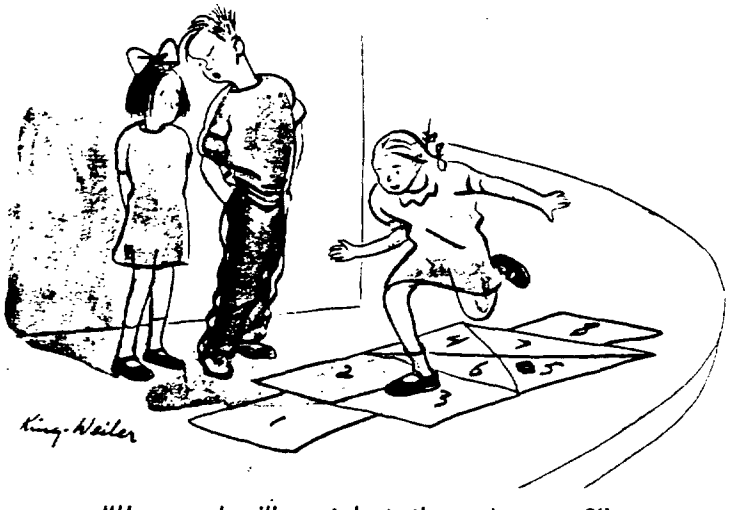
The improvement in automobile engines thus brought about was in part an increase in the performance factor, so highly prized by American drivers, and in part an increase in the economy factor. Performance was boosted about 25% and economy more than 30%. Thus, by appropriate changes in cars, based in part upon the more nearly knock-free gasolines available and in part upon refinements in design, the automobile engineer has made substantial increases both in performance and in ton miles per gallon.

Now all the gains that are possible have not yet been attained, of course. The high compression engines built in our laboratory and already mentioned have demonstrated that. Those engines give a third more miles per gallon than those of the present. This gain in economy comes about in part because of the higher specific power output of the high compression engine which gives it the advantage of lower piston displacement and lower friction horsepower. At full throttle those engines give fuel economies comparable to that of the diesel engine.

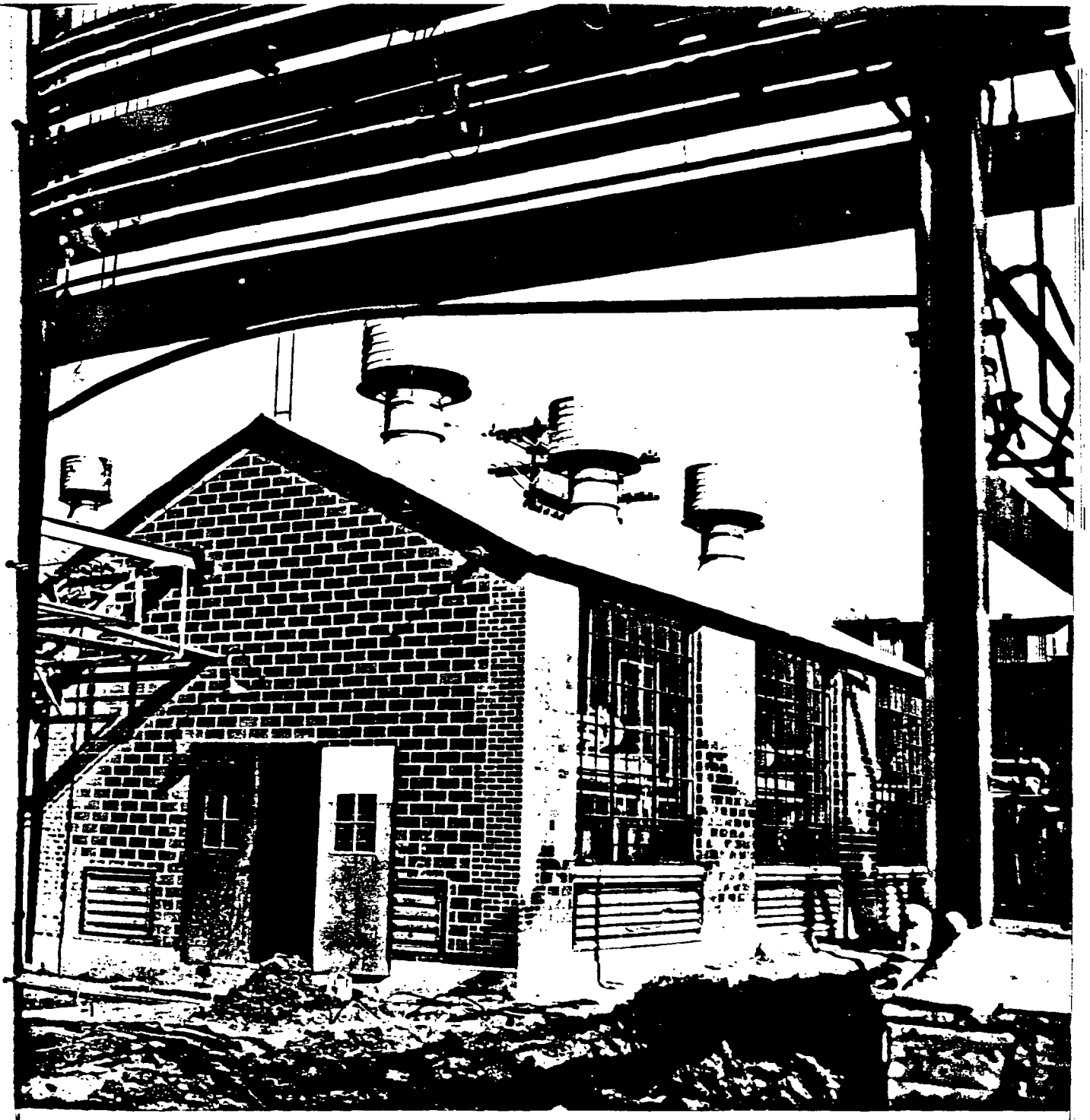
Higher octane fuels to run them on are needed before such engines can be made generally available, of course. However, thanks to the extensive research already mentioned, it is known that such fuels can be made. In fact, the fuel required for those engines is no higher in octane number than can be produced experimentally in United States refineries at the present time. It only remains to find how it can be done economically enough to be practicable. But the further gains to be had in respect to fuel economy, and the consequent conservation of our valuable petroleum resources, are so large as to make it desirable that they be put into effect just as soon as possible.

The opportunities for making further improvements in the automobile are not limited to the case just related, of course. The motor car is still far from being so perfect that nothing is left for the men of your generation to do. To be sure, I do not have enough imagination today to say just what the further improvements will be that you men will make. If we had that much imagination, we might just as well go ahead and make those improvements ourselves. But we have neither the imagination nor the knowledge required. I am so confident that the men of your generation will do a great deal to advance the automobile further that I should surely like to be around 20 years from now to drive your 1969 model.

OUR COVER: The colored flasks laid out in a neat pattern add up to more than just an attractive photograph. Taken from beneath a glass table top, the picture shows a group of sulphur tests in progress at Ethyl's gasoline testing laboratory in Yonkers, N. Y. The test, which determines the percentage of sulphur in a gasoline, begins when a sample of the gasoline is burned in a wick lamp and the resulting fumes are absorbed in a sodium carbonate solution. This mixture is then neutralized with hydrochloric acid. The percentage of sulphur in the gasoline is computed from the amount of acid required to bring about neutralization. This is but one of eleven tests which are performed at Ethyl's five gasoline testing laboratories. The color photograph was taken by O. Winston Link. **OUR PICTURES:** Page 3, Philip Gendreau; Page 4, courtesy General Motors; Pages 8 (top), 9, 10, courtesy U.S. Department of Agriculture; Page 11 (top), courtesy Standard Oil Co. (N.J.); Pages 14-17, courtesy Southwest Research Institute; Pages 18-21, courtesy International Trade Mart.



"How much will you take to throw the game?"



NEW NITROGEN PLANT AT BATON ROUGE

The recently completed nitrogen plant at the Ethyl manufacturing plant in Baton Rouge is one of a number of smaller installations being built as a part of the over-all expansion program for increased production of "Ethyl" antiknock compound.

Since it first began operations, the new nitrogen plant has turned out 100% more of the inert gas than older equipment would have produced. It houses three complete units, which can easily meet requirements anticipated after the alloy building addition and the two new tetraethyl lead buildings at the plant are completed. Nitrogen is used as a protective blanket during certain steps in the manufacture of the lead-sodium alloy and tetraethyl lead.

The plant uses hydrogen to burn oxygen out of air, leaving nitrogen as a residual gas. Before it is piped over for its part in alloy and tetraethyl lead operations, the nitrogen is purified and dried. With the atmosphere as its source, the supply of nitrogen is, of course, unlimited.

ETC 24033

FROG OR TOAD?

They're so much alike that some species are called toads by some people and frogs by others. However, frogs usually have smooth, moist skins and webbed hind feet. Most toads have rough, "warty" skins, and less webbing between their toes.

**Prepared in cooperation with specialists of American Museum of Natural History.*

When you see these "look alikes"

THE "TRADE-MARKS" OF NATURE*

identify which is which

When you buy gasoline . . .

THE TRADE-MARK "ETHYL"

identifies gasoline stepped up with "Ethyl" antiknock fluid

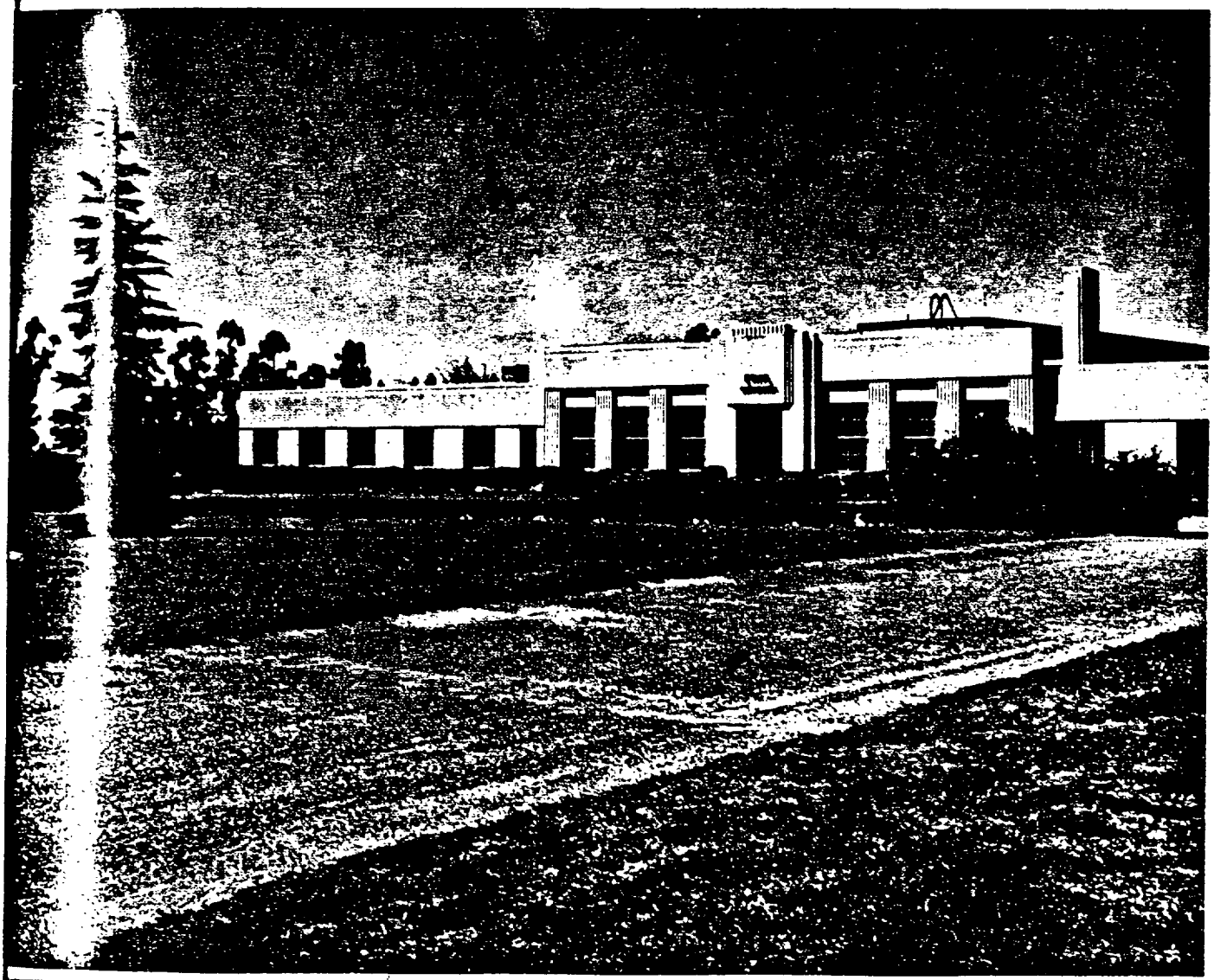
ON A SHORT HOP OR A LONG HAUL . . .

get eager, alert performance that snaps you through traffic . . . feel smooth-flowing power that adds pleasure to open-road driving . . . ask for "Ethyl" gasoline — high quality gasoline improved with "Ethyl" antiknock fluid, the famous ingredient that steps up power and performance.

ETHYL CORPORATION, *Chrysler Building, New York 17, N.Y.*

ETC 24034

ETHYL NEWS



MARCH 2 1942

ETC 24035

One of the featured speakers at a meeting of the Automotive Transportation Service Superintendents' Association in Toronto last month was Edwin C. Paige, who heads up Ethyl Corporation's fleet work.

The large gathering of Dominion maintenance specialists heard Mr. Paige discuss engine design and maintenance in relation to its effect on valve life in commercial vehicles. He had led a panel discussion on the same general subject before the New York Section of the Society of Automotive Engineers a few days earlier.

Mr. Paige has been head of the Commercial Engine and Fleet Section of the Technical Service Division, with headquarters at the Ethyl Corporation Research Laboratories in Detroit, for the past year and a half. Prior to that, he was an engineer in Technical Service for seven years.

He began his long association with Ethyl Corporation in 1930, two years after graduating from the University of Maryland with a Civil Engineering degree. For five years Mr. Paige served as a field representative and fleet engineer in the former Ethyl division office in Baltimore, his home town. From 1935 to 1940, when he transferred to the Technical Service Division, he was fleet engineer on the staff of the company's division sales office in New York.

As a member of the SAE, Mr. Paige has been active in committee work. Presently, he is on the membership committee of the SAE Truck and Bus Activity. He also has served on several committees of the American Transit Association.

IN THE

ETHYL NEWS

MARCH 1949

PUTTING PEOPLE IN THEIR PLACES 3

Today, people of all ages are turning to psychological testing for a good reason: These tests help uncover their best aptitudes and point the way to successful careers.

CLOWNING ACHIEVEMENT 7

Every day is April Fool's Day to the practical joker. His pranks are often carefully planned affairs. He has been known to dig up streets, put red ink in the liquid soap dispenser, send cigars to a girls' school, and build an "upside-down" room for tipplers.

FAME AT THE PUMP 10

Many service stations throughout the country are operated by a wide variety of noted people. Here is a picture story about a number of station operators who have gained prominence in other fields.

ELBOW ROOM FOR RESEARCH 12

Muroc Dry Lake is today the setting for pioneering research in aviation. A decade or so ago, another group of pioneers used it for tractor and automotive research.

FUR, FEATHERS, AND DECEIT 16

The manufacture of fishing flies is an industry that defies mechanization. Several thousand people scattered about the country are engaged in the handicraft which dates back to the ancient Macedonians.

WHERE DOES THE FARMER STAND NOW? 19

After World War I, American farmers suffered severely in the aftermath of the postwar inflation. This time, however, they ore in a strong economic position as they pass through the broad transition from war to peace.

In order to widen the fields of reader interest in Ethyl News, we frequently publish articles contributed by writers not associated with Ethyl Corporation. Opinions expressed in signed articles are the authors'. The editors of the News welcome articles of timely interest submitted from outside sources.

Published by ETHYL CORPORATION, 405 Lexington Avenue, New York 17, N.Y.

Manufacturer of "Ethyl" antiknock compound, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, secretary

ETC 24036

1949

Increasing numbers of people are using psychological tests to learn more about themselves and their abilities

PUTTING PEOPLE IN THEIR PLACES

WHAT CAN YOU tell about a man simply by looking at him? Years ago a group of Army psychologists decided to try an interesting experiment.

They selected a group of soldiers and proceeded to judge them at "face value." Simply by looking the soldiers over, they wrote down their impression as to each soldier's probable mental ability. Afterwards, they compared their guesses with the results of scientific intelligence tests of the men, which had previously been taken.

The tests showed the psychologists to be poor guessers. They made many errors when they guessed on looks only.

Through tests such as these the Army has learned you can't judge a book by its cover – or a man by his face. So, too, has industry. In recent years, a growing number of business firms have turned to scientific analysis in the selection of applicants for jobs. To insure that they select the right man for the job, they make use of carefully developed psychological tests.

Psychological tests are available which can measure other things besides a person's intelligence quotient. They give a pretty good idea as to whether a man would make a butcher, a baker, a banker, or almost anything else. As many as a dozen tests are given to measure an individual's potential abilities. He may be tested for finger dexterity, mechanical aptitude, and aggressiveness, besides his general intelligence. The results of these tests usually provide a good clue to a person's aptitudes, personality and interests.

Help Many People

Many kinds of people take psychological tests. They are taken by students, debating what professions to follow. Applicants for jobs and candidates for promotion within companies take them. Also those dissatisfied with their present jobs and anxious to learn where and how they can better themselves have been

N.Y.

secretary

ETC 24037

helped by testing. They are sometimes even taken by men and women who wish to know if their likes and dislikes spell out the prospect of a suitable marriage.

Industry has been increasingly turning to these psychological tests as a means of screening applicants scientifically. To many firms, these tests provide a means of fitting square pegs in square holes. As a result of using psychological tests trends in hiring are away from selecting an employee simply because he "makes a good impression" during his first interview. For instance, after one firm started using aptitude tests for the selection of clerks, 90% of those hired performed their work successfully. Before aptitude tests were used only 70% of those hired could meet the standards set by the company.

Psychological testing has been growing in acceptance. In 1936 the National Industrial Conference Board reported in a survey that less than one firm in 14 used tests. Eleven years later another survey showed that one out of every six firms were using tests.

Selecting Salesmen

In the field of selling it is an accepted axiom that good salesmen are hard to find and "harder to pick." Psychological testing has even gone into that field and come up with an answer. The Personnel Institute, Inc., a nationwide firm specializing in scientific selection, has studied large groups of successful salesmen, and the data from these observations have produced a "composite successful salesman."

The Institute learned that the successful salesman is pretty much the man you'd expect him to be. He is married. He is aggressive and realistic. He is interested in making money, and a lot of it. He likes a lot of action and becomes restless if he has to sit still too long. He likes to meet people. He is sure of himself and sometimes a little on the cocky side. With these and other traits in mind, the Personnel Institute mapped out a battery of tests that would measure a man for these qualities.

If an applicant indicated that he preferred to be with people, that he liked to make public speeches, and that he liked to dominate others; he has definite extrovert characteristics — a necessity for selling. On the other hand, if he disliked all of these characteristics and preferred to work alone, he has definite introvert characteristics and is more likely to find success in fields where he must work alone.

A large manufacturing company reduced turnover among its salesmen by 36% and it attributes this record almost entirely to effective selection by scientific interviewing and aptitude testing. Other companies have shown results which are just as gratifying.

To be successful, aptitude testing

Psychological tests measure everything from mechanical aptitudes (left) to possible sales ability (below)

ETC 24038

must be carefully tailored to fit each job. There are, however, certain generalizations that apply to types of jobs.

It is simple logic that a man who likes desk work and who prefers to work by himself probably will make a better adjustment to bookkeeping than to selling. These traits are determined by asking an individual a series of questions such as "Do you usually try to take added responsibilities on yourself?" "Do you like to make public speeches?" "Do you take chances?" An aggressive person will usually answer these questions with a "yes." In a long series of questions of this nature (some of them seemingly foolish), he will answer at least 80% of them in a positive manner.

What makes for a successful executive? The sum total of research in this field indicates that a successful executive has these traits:

1. He acts on his own.
2. He has a strong drive toward his goals and a strong desire for material rewards and prestige.
3. He is constantly achieving in order to be happy.
4. He is an able organizer.
5. He is strongly realistic.
6. He has a constant urge to be on the go.
7. He is sure of his beliefs and decisions.
8. He is decisive, without necessarily making snap decisions.
9. He is able to take orders.

Interestingly enough he frequently has a strong fear of failure and many doubts of his ability to do as good a job as he wants to. And in his thinking he tends to identify himself with his superiors rather than his subordinates and he chooses his friends accordingly.

A man without an abundance of these qualities will rarely make good as an executive. But for those who believe that the executive's life is an ideal one, there are some rude jolts. Successful executives are not usually easy-going and their life is a constant cycle of hard-hitting drives interspersed with sessions of relaxation, a necessity to anyone who must keep up a fast pace. The pleasantries of life and the slow-easy-going pace enjoyed by most professional persons are almost never part of a successful executive's life.

Psychological tests are frequently used on children to detect unusual abilities that can be encouraged during formative years

Measures Probabilities

The human inventory tells a man the fields in which he will be most likely to succeed. It does not assure him of success. It merely measures his *probability* of success if he applies himself.

Ed Small's case shows how important this information can be.

Ed had been out of college for three years. He had dabbled in a number of things without getting anywhere and he had reached the point where he wondered if there was anything he could do to earn a living. The one thing Ed always wanted to do was to paint, but he had the idea that artists were unstable people and he would never be able to earn a living at it. An aptitude test indicated that he had a great deal of artistic ability. Competent critics considered his first attempts "exceptional." So Ed took up art and today is one of the country's leading magazine illustrators.

Psychologists point out several important factors in Ed Small's case. First, people who drift from job to job too long become seriously demoralized. Second, many persons have gross misconceptions concerning the type of work they think they'd like to do. Ed thought that painting "was for sissies." Third, many people would like to tackle a new career and put everything they have into it, but hesitate to do so because of an underlying fear that they are not fitted for that type of work. Psychological tests give them the assurance they need.

Psychological testing, however, is not limited to young people. There is no age limit when it comes to inventorying a personality. Today men in their fifties, sixties, and sev-

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enties are taking psychological tests to learn what types of work they can do. In many cases they want to know how they should use their spare time when they retire. In other cases they have learned that their present jobs demand too much of them physically and they must turn to another less strenuous field.

There is no such thing as failing an aptitude test. A low score for a series of tests covering a job merely means that the man is *probably* not suited for that particular job. He may take another series of tests and find that he is unusually well equipped to handle another job. Or he may have such a strong urge to be a success that he will succeed despite original handicaps.

Many older people who have been in their jobs for a long time have a dread of taking an aptitude test. They are afraid that a low score will prove them to be inept and make them feel that they should have gone into another type of work.

The odds are very much against this happening to them at all.

Most people, over a period of years, tend toward the kind of work that best suits their abilities. Studies of men who have been in their jobs for five years or more indicate that these men are almost always well qualified to do their work. Veteran employees, nonetheless, can still profit from the results of an aptitude test. By studying the results, the weak links in the chain can be given attention and improved.

Latent Abilities

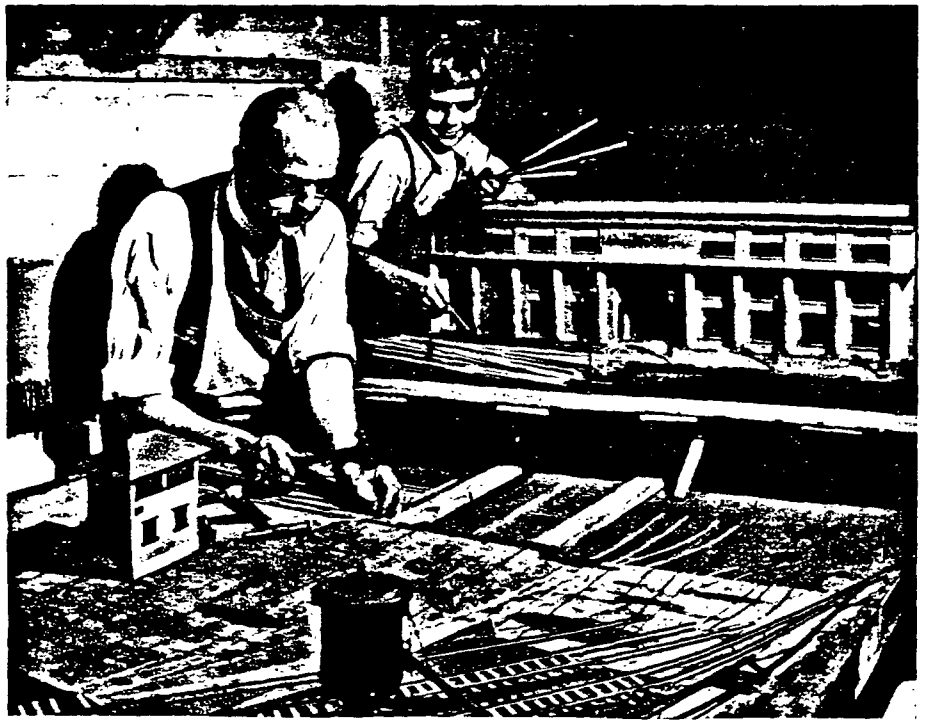
"As a result of testing over 75,000 people," the head of a large personnel testing organization explains, "we have come to realize that most of us use only about 30% of our potential abilities. The great problem of management is to help the individual employee find his weaknesses and show him how to improve himself as an individual as well as an employee."

Science has yet to explain why some people are born with a greater brain capacity than others, but psychologists have learned to measure this capacity. They can even make a few simple measurements of children at the age of two. Many a young man has struggled through high school and then managed to get a college degree only to find that the thing he really wanted to do did not require a college education. Psychological testing is especially valuable before entering college.

Most testing today is conducted by universities or organizations which specialize in analyzing industrial personnel problems. In any event an experienced doctor of psychology is on hand to direct activities. Successful tests are not short-order affairs. The minimum time required to conduct even brief testing is around four hours and some test series take as long as a week. Most adequate testing takes from four to twelve hours.

Anyone desiring to take a test on his own has a number of agencies he can look to for guidance. He can work through recognized business clubs and associations, universities, social welfare groups, veteran's organizations and Better Business Bureaus. These organizations usually have contacts with organizations engaged in psychological testing. Much of the work they do is to help people get started in a career, and it is at this point that psychological testing plays an important role.

One of the most perplexing problems many men face during their lifetime is what to do to earn a living. Psychologists admit that psychological testing has not completely solved the problem, but it has gone a long way toward putting many on the road to a successful and happy career.



Management has learned that hobbies often lead to better use of a man's latent talents in his job

Clowning Achievement

Life is never dull when the practical joker is around. He can pull anything out of his bottomless bag of tricks

APRIL FOOL'S DAY may be just around the corner, but don't let the date deceive you. There's no closed season for the practical joker. He's just as much on the loose in August as he is in April, and June can be as bad as January, and usually is. April first only happens to be the day we officially take notice of this strange species of human being.

It doesn't matter whether you live in the city or in the country, or whether you practice law or shovel coal. Sooner or later you run into the perennial prankster. Then heaven help you.

At best, the practical joker is the one who leaves a message for you to call Mr. Cloud, and the telephone number the humorist gives you is of course the Weather Bureau. At worst – well, the scope of his ingenuity has a lot in common with the extent of the universe.

To the inspired joker, nothing is safe and nothing is sacred.

Governments, radio announcers, tavern-keepers, police departments, business men, rescue organizations, old maids and museum curators must all contend with the puckish spirit. Accidents, injuries and even deaths have sometimes occurred from the more insane attempts at humor, but fortunately for all concerned, a red face and an acute sense of suspicion are usually the only aftermaths.

A handsome doctor with a jealous wife once received a series of bills for intimate feminine garments which some wag had charged to his account. Boston still remembers the young men who roped off a busy traffic intersection, dug a deep hole – and then knocked off at quitting time, never to return. Then there was the broker who put red ink in the washroom liquid soap dispenser, and the banker who lighted his cigars with counterfeit (but very realistic) $50 bills which an amazed client thought were genuine.

It may be true that certain kinds of people are worse offenders than others when it comes to practical jokes, but it's hard to draw the line.

Take the case of a member of the British Parliament, known as much for his practical jokes as for his political acumen.

One evening, dressed in overalls, he was busy hanging some newly acquired paintings, when he ran out of the twine he was using. He didn't bother to change clothes, but went out to get some more. On his way back from the store he passed a neatly dressed young man.

That did it.

The M. P. tipped his hat and said politely, "Sir, I wonder if you would help me. I'm surveying this block but my assistant hasn't shown up. Would you mind holding one end of this string for a minute while I go around the corner to measure the distance?"

The stranger hesitated but finally agreed. The joker unreeled the twine and disappeared around the corner. Here he met another gentleman, and – yes, you've guessed it. After telling the same story, the Parliamentarian walked around to the next intersection – and then home to bed.

There's a somewhat similar story with its locale a fashionable Philadelphia suburb. Two otherwise normally behaved men chose the week of the Fourth of July for a prank.

Their props were old clothes, a horse and wagon, and plenty of unabashed nerve.

Selecting an imposing mansion, they drove up to the front door, and when the butler answered, calmly announced that "we have come for the sofa." The butler even helped them load a mammoth Louis XIV divan into the back of the wagon, and off the two rascals went.

A short distance away they turned in at another estate, rang the bell, and informed a pert maid that "we are delivering the sofa." With the care and precision of professional decorators, they finally chose a spot for the filched piece of furniture, chucked the parlor maid under the chin, and drove away.

Fun with the law ranks high among the favorite pastimes of the practical joker. Many such pranks have been repeated often, however, and shrewder guardians of the peace are not easily taken in.

For example, if you and some friend think you are smart, just buy a nice new bench, take it into the park, and then start to walk off with the bench just as a cop is going by. The chances are that the patrolman will wearily ask you to show him your bill of sale, and not try to run you in for pinching "city property" — the way you might have hopefully expected. That gag has whiskers by this time.

Even so, the police never know for sure what's coming next.

A judge in Wichita, Kansas, recently had a man-sized job in soothing the ruffled tempers of irate citizens. They complained that their cars had been unjustly tagged outside a ball park. A book of tickets lost by a traffic officer had fallen into imaginative hands, with the result that summonses appeared on all the automobiles in sight. And in London not long ago, hundreds of John Smiths stampeded into court via summonses issued mysteriously by an unknown prankster.

A police rescue squad in Providence, R. I., once carefully fished a "body" from the river, only to find that the bobbing head was a coconut with a blonde wig cleverly attached to it. Every year hundreds of bottles are washed up on beaches containing distress notes, like "Help! We are sinking!" These messages are patiently investigated by the Coast Guard and other authorities — and are invariably fakes.

Get a bunch of old grads together from any college or university, and the stories of their pranks will go on for hours, ranging from the cow in the chapel belfry to stink bombs under the dean's chair. They remember how Jim Jerk (the card) sprinkled itching powder in his roommate's trousers, or the time old Bob Brainstorm put straight gin in the opposing team's water-bucket during the big football game.

As you might expect, animals are often used as props behind the backs of the protective animal societies.

Cats in the Post Office

One of the best known incidents occurred during the first World War, when someone put an ad in a New York newspaper, offering $2 for cats which allegedly were to be sent to Germany. The felines, according to the advertisement, were to be turned loose against rats infesting camps where Americans were being held prisoners.

Patriotic cat-owners were urged to bring their animals to the Central Post Office. Not long after the doors opened, some 4,000 men, women and children, each with one or more cats in his arms, jammed the corridors of the building. The din and confusion grew to such yowling proportions that the postmaster

had to call out the police reserves to disperse the crowd.

Another yarn concerns an artist, who once acquired a tiny turtle at a Parisian night club. When he returned home, he offered it to his concierge, a kindly woman who was delighted with the gift. The next night the artist procured a slightly larger turtle, and stealthily replaced the first one with his new acquisition. Over the next couple of weeks he would exchange each succeeding turtle for a still larger one, until he had used the biggest he could find in Paris.

The concierge was beside herself with joy at the marvelous "progress" the turtle had made under her care. "I have an art with animals," she would say. "Regard the happy effect of my care upon this creature. In two weeks it has become a giant!"

But then the artist started to reverse the process, and the turtle grew smaller and smaller. The poor woman didn't know what to make of it. She changed the turtle's diet, protected it from drafts, and tried keeping it first in bright sunlight and then in the shade. Of course it continued to shrink. In despair she consulted the curator at the museum, but he could offer no advice nor explanation.

Still the turtle became more and more diminutive, until at last it disappeared altogether. The concierge was heartbroken but stoic. "Com-

fort yourself, monsieur," she said, informing the artist of the tragedy. "It is, at least, historic."

Jokes in the business world can be among the most annoying, and often prove costly. Here again, nobody is safe.

A cigar manufacturer discovered too late that a large C.O.D. shipment of expensive stogies, especially wrapped and banded, was consigned to a fashionable girls' boarding school in the South. Hotel keepers have long since learned it's best to check any suspicious reservations for the bridal suite and other accoutrements, lest the newly married couple turn out to be a pair of mules.

A dressmaker was asked to order elaborate lace for one "Clementine R. Bradford," only to find out that the name belonged to a fishing trawler. In New York not long ago, a tavern keeper spent a jittery afternoon waiting for a load of sawdust which a firm voice over the telephone had threatened to dump on his sidewalk.

The entertainment world has perhaps had more than its fair share of jokesters, ranging from the anonymous movie patron who didn't like the show to some of the biggest names in lights.

A man who saw a bad film returned next day with a large box of moths, and when he released them, they of course flew into the light from the projector, and literally blotted out the Grade C sequences. Two nationally known comedians, however, were foiled when they sneaked into a popular announcer's studio as he was doing a sportscast. The two friends cut the announcer's suspenders and then proceeded to strip him down to his shorts — but the announcer never missed a word of his spiel.

Corpse on a Tree

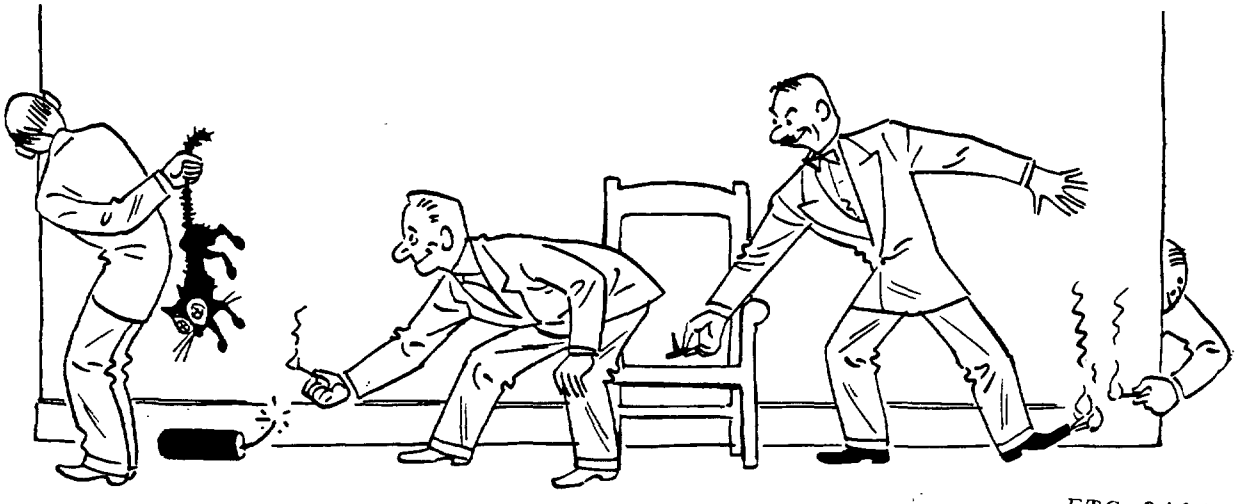
But it is still the unclassified individual who sets this old world of ours by the ears, day in and day out. An excited motorist telephoned authorities in Los Angeles to say that a fashionably dressed woman was hanging by a tree on Colorado Street. When the apparently lifeless form was cut down in front of hundreds of horrified onlookers, it turned out to be a store mannequin.

Other alleged humorists have been known to put mannequins (male) into the boudoirs of respectable old maids, just to hear the poor spinsters' shrieks. A young matron fainted dead away on the street when a neighbor substituted a bonneted pekinese for the infant in the mother's baby carriage. Some office clerks the other day poured a local anaesthetic into a bottle of gargle solution their boss was using for a cold — and the boss' deep bass voice turned to high falsetto for several hours. The anaesthetic had numbed his vocal cords.

One of the most elaborate set-ups for practical punishment was the special upside-down hangover room one ingenious character rigged up at his home. When a guest would have too much to drink and fall asleep, the unfortunate victim would be dragged into the upside-down room and draped around a chandelier sticking up from the floor. A rug, chairs and tables were fastened to the ceiling overhead. Imagine the plight of the fellow when he woke up the next morning, with splitting temples, and then tried to "climb down" from the chandelier.

Fortunately the day of the special gadgets is not as rife as it once was, although manufacturers of dribble glasses which leak, red pepper candy, plate lifters and exploding cigars still do a good business.

If you want to avoid the practical joker, you might as well stop trying. He's as inevitable as death and taxes, and not much more fun, although there are some hopeful signs that his heyday is waning. About all you can do is keep your fingers crossed and hope for the best. It might help too if you have a little bag of tricks up your own sleeve, just in case.



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Fame at th

DON'T LOOK NOW — but your neighborhood service station operator may be a celebrity. Many people who have attained prominence in other fields have entered the service station business. Some are well-known sports figures. Others are public officials. There is even an occasional stage or screen star in the ranks.

For some of these people, their service station

Marlin (Pat) Harder, Chicago Cardinal star fullback, fuels a car in Milwaukee. The former University of Wisconsin athlete owns and operates the service station

Left, public officials are well represented in the service station fraternity. Among them is Harold Chirnside, Mayor of Sterling, Colorado. He has operated a Standard Oil Company of Indiana bulk station since 1930. He supplies many nearby farmers and ranchers

Left, Joe Paparella, American League umpire, operates his station the year round and he is on the job personally as soon as the baseball season ends. His staff pinch-hits at the pumps while he is on the diamond

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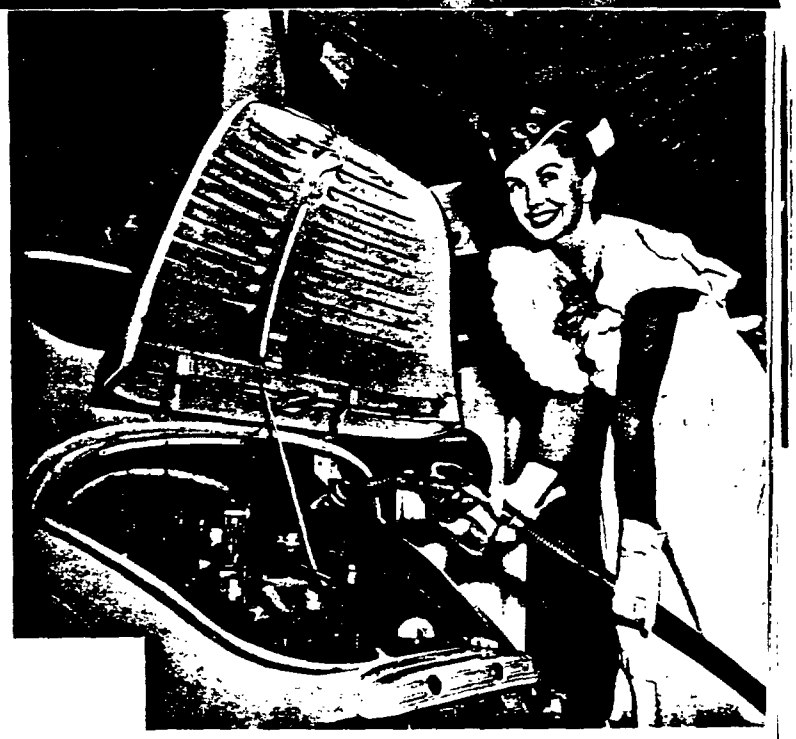
...hePump

A surprising number of public figures can be counted among the ranks of service station owner-operators

represents a profitable sideline to their regular profession. Others, as in the case of baseball players, operate their stations year round, and pitch in during their off-seasons. Still others have entered the business upon retirement from active sports competition. Pictured on these pages are a number of noted figures who find the service station business a good business.



Movie star Esther Williams gives her husband, Ben Gage, a hand at the opening of his Union Oil service station in Santa Monica, Cal. The opening was Hollywood style

One of the busiest men in Cheyenne, Wyo., is Mayor Benjamin Nelson. He is one of the youngest mayors of a capital city in the country and after his daily duties as mayor are finished he doubles in brass at his Frontier service station. He is frequently found on duty during two or three hours every evening and on weekends

Robert (Bob) Smith, retired Boston Braves baseball star, now owns and operates a Gulf service station in Atlanta, Georgia. Smith pitched for the Braves from 1923 to 1937

Dave ("Boo") Ferris, Boston Red Sox hurler, tied the American League record by winning 46 games in 1945 and 1946. He and his brother run a service station at Shaw, Tenn.

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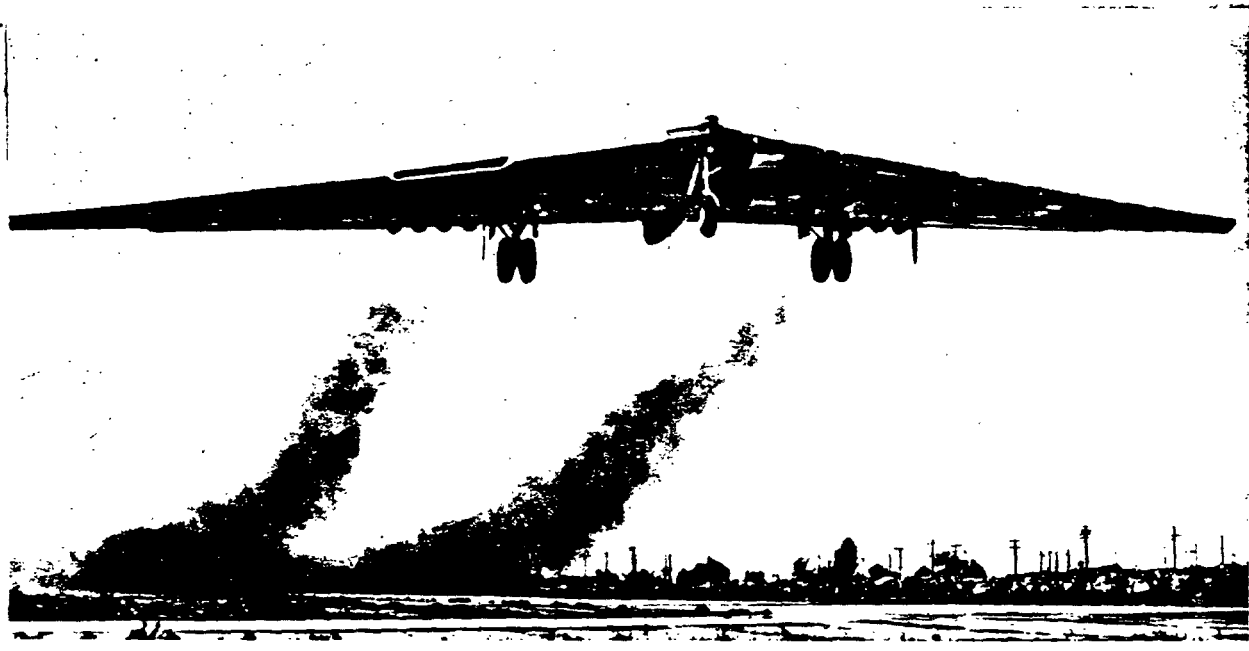


ELBOW ROOM FOR RESEARCH

Now a proving ground of the air for the U. S. Air Force, Muroc Lake was once a testing center for Ethyl engineers

JET PLANE FLIES HUNDREDS OF MILES FASTER THAN SOUND

JET BOMBER'S RANGE RISES — FLIES 3,458 MILES IN CALIFORNIA TEST

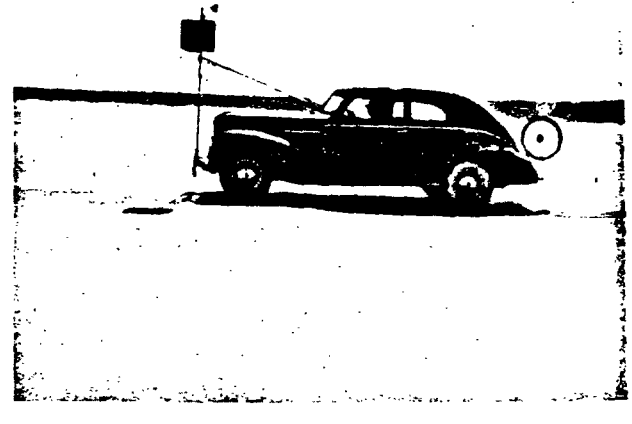
X-1 CLIMBS 13,000 FEET IN A MINUTE

EYE-RAISING HEADLINES such as these pop out of newspapers with increasing frequency these days. They tell of how man is flying faster and farther than anyone ever traveled before. Such achievements are the stuff that dreams have been made of ever since man first learned to fly. Now, they are becoming commonplace accomplishments for men of the U. S. Air Force.

Into the wild blue yonder today go aircraft capable not only of approaching the supersonic wall – the speed of sound – but able to pierce right through it with speed to spare. Our spanking new jet bombers fly non-stop from coast to coast – and do it at speeds of upwards of 600 mph. The experimental X-1 rocket ship, fastest plane in the world, can zoom up into the heavens at a clip of 2½ miles a minute, a rate of climb unheard of even in 1948.

But our story is not about these history-making flights. Rather, it concerns the place where this history is being written. Secrecy, year-round favorable weather, and plenty of elbow room are essential in the assaults on aerial time and distance barriers. Probably no other locale in the country offers such a happy combination of those desirable features as Muroc Dry Lake in Southern California. At least, the Air Force feels that way. For it is there that the nation's air arm has fashioned perhaps the largest and greatest flight test base in the world.

Remoteness, good weather, and ample unhampered flying area. Muroc has all three in excess. It is only a hundred miles from Los Angeles, but situated in the heart of the Mojave Desert far back from the



Top, this Flying Wing (YB-49) was tested at Muroc Lake. This type jet bomber recently made a 2,258-mile trip cross country . . . Right, during the Ethyl road research program at Muroc Dry Lake in the late 1930's, the wind velocity was measured (with this anemometer) during the exhaustive tests

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only main highway, it is figuratively a million miles from nowhere. Except for rare spells like this past winter, Southern California's weather is ideal for flying. As for room in which to maneuver jet and rocket planes – there is only a handful of buildings, mostly shacks, for miles around.

Muroc is new, as military installations go.

It was first permanently manned by GIs in 1941, and then only by a detachment assigned to maintain air targets for planes based at March Field, also in Southern California. In 1942, some P-38 pursuit ships moved in for training. Later came the B-24s and the B-29s. Meanwhile, the Air Materiel Command, with headquarters at Wright Field in Dayton, Ohio, set up shop on a section of the dry lake bed. Since then, except for a few months right after the end of the war when it went on standby status, Muroc has been growing – not only in size and scope, but also in prestige.

But while the armed forces have made use of Muroc only in the past eight years, its outstanding value as a great natural proving ground has been recognized for at least twice that long. And though it is now being used as a base for advanced aeronautical research, Muroc first served as a means of furthering the progress of gasoline-powered land vehicles. Ethyl Corporation, for one, made extensive use of the dry lake testing area from 1935 to 1939 on projects associated with tractor and automobile engines and their fuels and lubricants.

Aided Tractor Progress

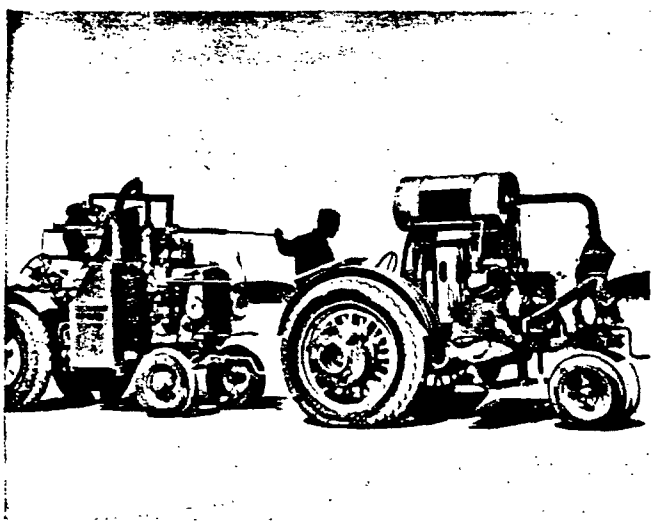
Muroc played no little part in converting the farm tractor engine from a cumbersome low compression distillate-burning affair to a modern high compression gasoline unit.

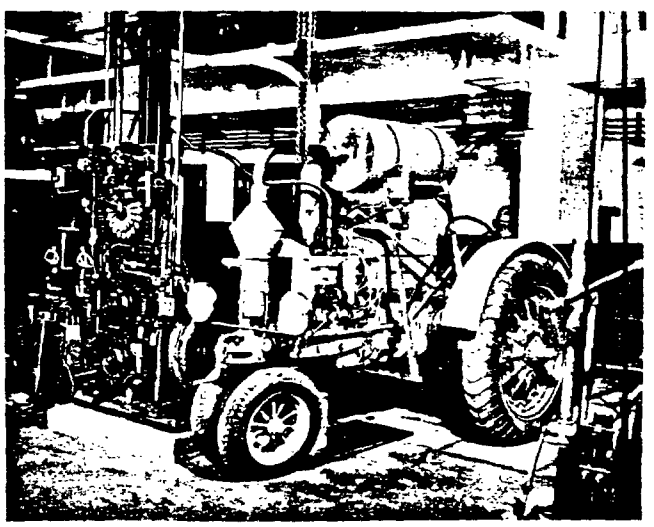
Before the Ethyl tests at Muroc in 1935-1937, few data were available on tractor engines and tractor performance, particularly with regard to variations in tractor design required for the most efficient utilization of the different fuels. Information obtained in the field tests, together with corresponding data compiled in the laboratory, was offered to tractor manufacturers as a guide in determining whether their individual companies would produce gasoline-powered tractors. The first such tractor had been marketed in 1935.

Reviewing the situation, a technical paper by three Ethyl engineers in 1938 summed up the need for the gasoline-versus-distillate tractor studies as follows:

"Approximately three years ago, the question of proper fuel for farm and industrial tractors became increasingly important to tractor manufacturers, oil refiners, and tractor owners. Shortly before this time, oil refiners had increased the octane number of their regular grade gasolines, giving a wide distribution of a fuel which was not only of improved antiknock quality but which, for almost the first time, was of quite uniform quality throughout the United States and Canada. Manufacturers of automobiles, trucks and buses were rapidly redesigning their engines to take maximum advantage of the new gasolines. The increased antiknock quality of these uniformly distributed gasolines accentuated the already wide margin in octane number between gasolines and kerosenes or distillates. Also, increased engine efficiency in auto-

Below, left, one tractor towed another at Muroc to simulate a normal load . . . Below, extensive laboratory studies preceded the field tests at Muroc Lake





mobiles, trucks and buses accentuated the unfavorable comparison of tractor engine efficiency with these more common types of internal combustion engines."

The resultant joint research program was sponsored by tractor manufacturers and certain oil companies. Its scope was so vast that no single research plant could handle the entire program. Consequently, individual laboratories were assigned phases of the over-all project. In common with the laboratories of several tractor companies the Ethyl Corporation Research Laboratories were asked to do three things: (1) Develop instrumentation and test methods which would permit the evaluation of tractor engine operation over a wide variety of conditions; (2) develop tractor engine design features for best performance on gasoline and distillate; and (3) determine the relative value of gasoline and heavy fuel in tractor operation.

Extensive dynamometer investigations at the Ethyl Laboratories in Detroit demonstrated that the test tractor gained optimum performance on distillates with a 4.32 to 1 compression ratio engine. For operation on gasoline (70-octane), a 6.14 to 1 head on a tractor – equipped to allow manifold temperatures to be lowered considerably – was found to offer the greatest advantages. During the two years of outdoor tests at Muroc, thousands of test runs were made in order to develop all fundamental data possible.

The comparative results obtained by Ethyl were impressive. The Muroc tests showed that at full load there was a 23% gain in power and a 26.7% reduction in specific fuel consumption for the high compression gasoline tractor. Most tractor manufacturers needed little further proof of the all-around superiority of the gasoline-powered tractor.

This onetime general store at North Muroc served as headquarters for the Ethyl tractor test crews

Had a farmer watched the Muroc experiments, he surely would have wondered at the strange goings-on. For, the test unit consisted not of a single tractor, but of one tractor towing another.

The reason for the tandem was quite simple, and demonstrated the thoroughness with which the tractor and oil industries conducted the joint program.

To Simulate Actual Load

Ethyl engineers had concluded that the use of a single tractor in an actual crop field would prove unsatisfactory for several reasons. Among other things, uniform soil conditions are never available in the same field even on the same day, and the motion of the tractor across a plowed field would make the use of delicate testing instruments difficult, if not impossible. Thus, it was decided that the tests would be conducted at Muroc and that the normal load would be simulated by having the first tractor pull another whose required draw-bar pull could be varied over a wide range.

If it looked strange to see one tractor pulling another, stranger still was a special platform on the first tractor. This was an observation post which extended on each side in front of the rear wheel fenders. It permitted an operator to ride near the controls and instruments used in connection with the measurement of draw-bar pull, fuel consumption, spark advance, engine revolutions, and distance traveled.

For many of the same reasons that it proved excellent for the 1935-1937 tractor tests, Ethyl selected Muroc for a special 1938-1939 study of new model automobiles.

Muroc Dry Lake is 12 miles long and five miles wide, and is world-famous for its absolute smoothness. Its broad expanse allowed for either straightaway or circular test routes. Visibility was practically unlimited and the absence of any road hazards allowed ultra-safe driving. Finally, the 40-50 degree F. differential between daytime and nightime atmospheric temperatures permitted tests under many climatic conditions.

The automobile tests were designed to add to the Ethyl Labora-

tories' vast storehouse of data pertaining to the effects of compression ratio and fuel antiknock quality on the performance and economy of vehicles. During this particular study, engineers observed that the wind was a major factor in car performance and fuel economy. This fact had been widely appreciated for some time, but there were few evaluating data to define just how great was the effect of wind.

As a means of gathering relative wind velocity information under a variety of conditions, Ethyl engineers hit upon the idea of erecting an anemometer atop a metal tripod at the front of the vehicle. The arrangement made a "tower" about nine feet tall. Ethyl no longer employs the anemometer tower in its normal performance measurements, but the original model at Muroc helped to gain new information on performance versus wind velocity.

Life on the desert was, in all truth, the combined existence of hermit and pioneer for members of the Ethyl engineering crews. They were quartered in what had been a general store, right at the rim of Muroc Dry Lake. They shared the old frame building with a family of borax workers who lived upstairs and a church congregation who used the building for its revival meetings.

Shaves were few and far between for the men, because of the lack of hot water. Except for weekend trips back to San Bernardino, where the Ethyl road research laboratory is located, the crews' only touch with the everyday world beyond Muroc was the drivers of test vehicles out of the San Bernardino laboratory. Tarantulas, scorpions and other venomous insects were almost nightly visitors. The men had to shake out their shoes each morning as a precautionary measure. Their only recreation was some occasional archery and pistol-sniping at rabbits and desert snakes.

Their Day Began at 2 A.M.

Every working day was 18 hours long, starting at 2 o'clock in the morning.

That was reveille time — time to roll out of bed, get dressed, and drive 40 miles round trip to the town of Mojave for breakfast and to pick up lunch in the form of sandwiches from the restaurant. Then, back to the base for a full day of vehicle testing and data computing. After another drive to Mojave for dinner, the crews enjoyed the luxury of a few hours of relaxation. But the most welcome hour of all was 8 P.M. That was bedtime.

In addition to being engineers, members of the test crews also acted as local weathermen and as good samaritans.

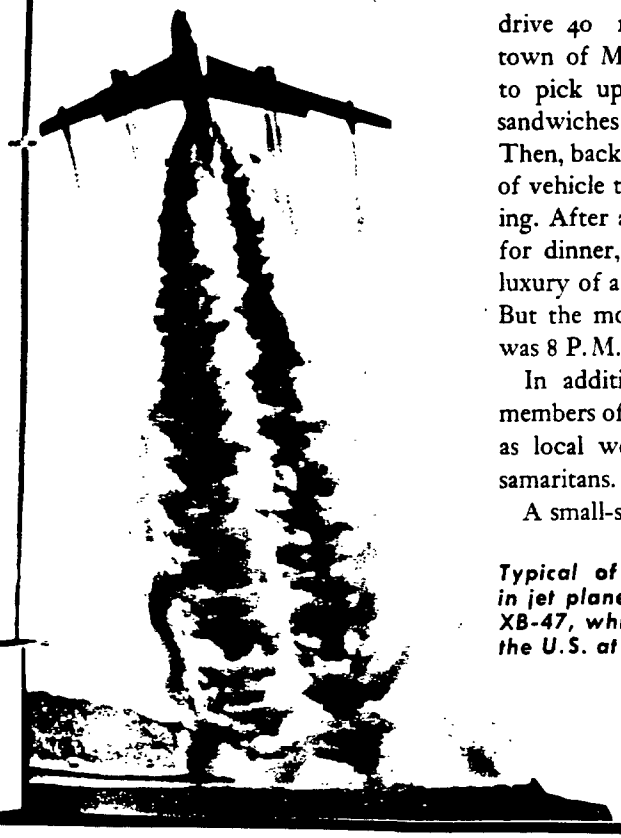
A small-scale weather station was maintained at the Muroc headquarters. This was necessary because barometric pressure, atmospheric temperature and other weather conditions are essential knowledge in tests that take in every type of variable on the performance of gasoline engines. The men played good samaritan to countless motorists whose cars ran dry on the lonely desert. The Ethyl engineers probably got more than their normal share of this "business" because the gasoline pumps, although long dry, still stood outside the abandoned general store where they were staying. In service stations all over the country, the gasoline pump is a friendly sight. In the middle of the desert, it is a veritable symbol of hope for distressed motorists.

But Muroc no longer accommodates the test tractor and automobile. Gone, too, are the pilots of these land vehicles. In their places now are machines — flying machines — whose speed has never before been seen. And men garbed not in engineer's togs, but dressed in special "man from Mars" clothing, to help them withstand the teeth-jarring actions of the rockets and the jets.

Still, it's the same old Muroc in one respect. It remains the same great natural proving ground that aided in years past in advancing automotive and tractor progress. The only difference is that today it is a proving ground of the air.

OUR COVER

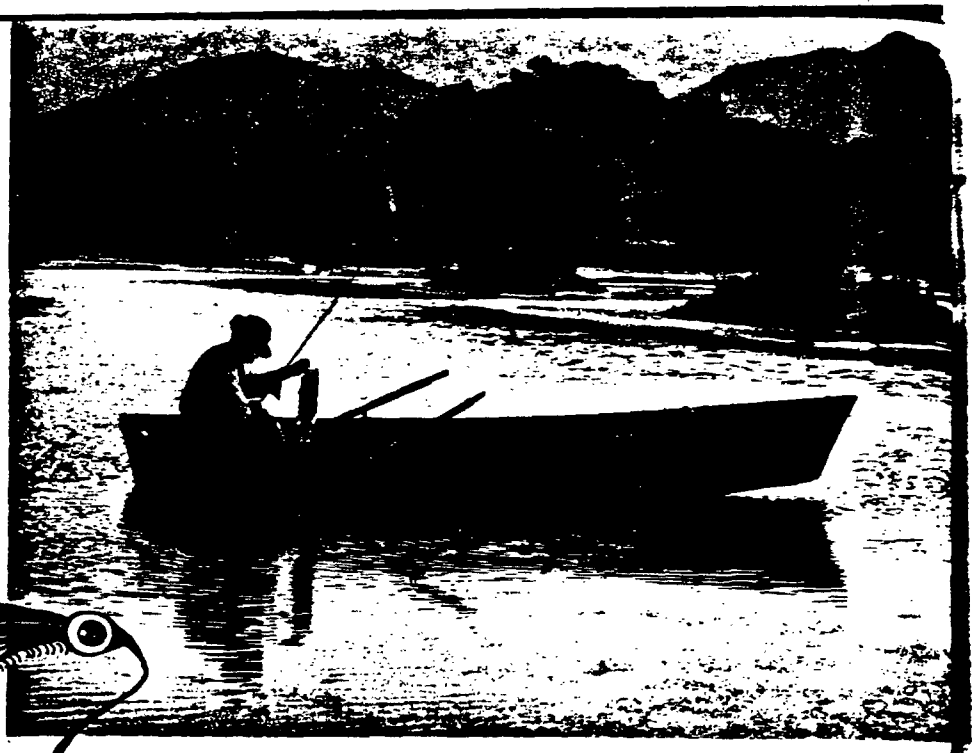
Pictured on our cover is Ethyl's road research laboratory at San Bernardino, California. The modern laboratory, constructed in 1938, has complete facilities for the testing of fuels and engines, and carries on continuing road test programs in the center of a great natural proving ground. The building also houses one of the Corporation's five gasoline testing laboratories.



Typical of the current strides in jet plane development is the XB-47, which recently spanned the U.S. at a speed of 607 mph

ETC 24049

Making flies to lure the canniest fish is no small job — in fact it's a big, fascinating business today



FUR, FEATHERS AND DECEIT

By Carl Abell

THE NEXT TIME you hook a fat speckled trout, or land some other kind of finny fighter, don't think for a minute that you caught the fish all by yourself.

You may have found the best spot on the lake or stream by intuitive judgment, or you may have plenty of evidence that your own skill was responsible for that bulging creel. But unless you are the kind of fisherman who makes his own flies — ones that work — a lot of the credit for your catch rests with the people who design and manufacture them.

Fly-making, as you might well imagine, is big business today. It has to be, in order to supply the needs of the nation's some 12 million fishermen. Besides new sales, there is a huge replacement market. Flies wear out, like anything else. Many more are lost to the big fish that invariably get away. Moreover, there are the vast numbers of flies, ineptly cast, which get caught and destroyed in the surrounding landscape. Oddly enough each year some are snatched by birds in flight.

But in spite of production running to many millions annually, the fly industry still defies mechanization, and remains a handicraft both in this country and in Europe. So, instead of factories, there are several thousand people scattered around the country, busy making flies the year round. All of the flies are wound by hand, using fine waxed silk thread to hold the materials in place. Large "manufacturers" are few — possibly a couple of dozen in number. Most of the "factory" production is done by women who work in their own homes, and who specialize in two or three patterns.

It takes many months for one of these specialists to become really proficient. They must work very fast, using every possible shortcut, if they are to make adequate returns at the prevailing rates for piecework. Each season, a new multitude of fishermen take up fly tying as a hobby. A certain percentage of them eventually start selling a few flies, or even a considerable number. Each year dozens of these amateurs go into full-time production — but competition is rugged.

A smaller number of tyers, possessed of good promotional ability and superlative skill, make a success of custom tying. They do their work directly for consumers, collecting a premium for their efforts. Only a few dozen patterns of trout

flies are generally available, except in the larger tackle stores. For the most part, these are supposed to imitate insects in either the adult or immature stages, which constitute important items of trout diet. There are hundreds of other patterns which are more rarely seen, but which have at one time or another taken fish.

It is the universal ambition of every gifted amateur fly tyer to originate a new pattern which will bring him undying fame through the slaughter of countless fish. Occasionally, a new one is created which attracts fish regularly enough to take its place with the immortals. Arthur Emery Low, of Santa Barbara, California, has in his lifetime developed two new types of flies which seem to have what it takes. At this stage of fly development, the creation of two highly successful new types in 25 years of effort is considered not bad.

While the origin of fly fishing is lost in antiquity, the written records go back a good long time.

Aelian, a Macedonian of good repute, who lived and wrote about 300 A.D., told how his countrymen captured the spotted fish in the River Astreus with an artificial lure fashioned from colored wool and the feathers from beneath the wattles of a cock. These are still two of our standard fly tying materials.

Izaak Walton, in his "Compleat Angler" (1653), described twelve flies used to imitate insects which constituted the favored foods of the trout during certain months. His fly bodies were all made of wool, in a few cases decorated with silk or "lapt about with the herl of a Peacock's tail." His flies all had wings, constructed from the feathers of local birds. The revered Izaak also gave directions for making an artificial caterpillar, or "Palmer Worm or Pilgrim," named after the Pilgrims of the era, which has evolved into our whole tribe of palmer tied flies, bi-visibles, woolly worms, emidas, and so on.

During Britain's rise to supremacy on the seas, every fly tyer knew some sailors who scoured the shores of the seven seas for feathers, furs, and fibers for the folks back home. By 1800 the feathers of birds from all over the world began showing up in the English and Scotch flies. Furriers contributed the trimmed-off edges of beaver, seal, muskrat, and fox skins, all of which went into the "dubbing" for fur bodies. Gold and silver tinsel came in from France, and of course, silk from the Orient. We still use all these materials, and many more.

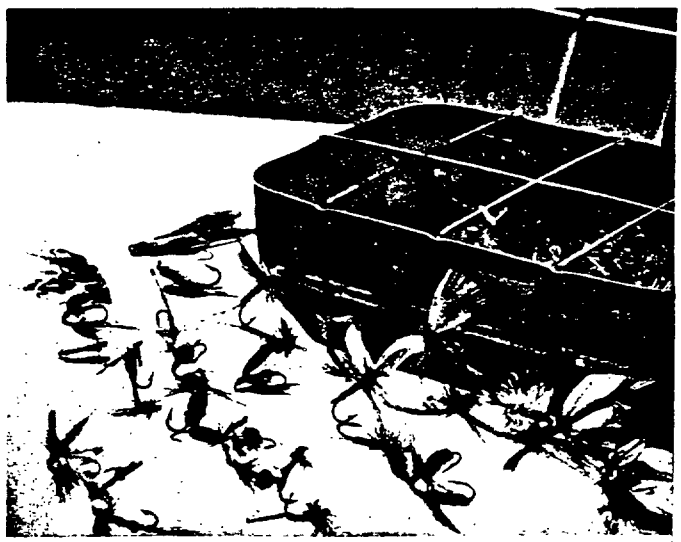
"Fancy" Flies

By 1850 most of the standby patterns of the English had been developed. While most of them were definitely imitative of the stream insects, a new kind began to appear. These were the "Fancy" flies – Flight's Fancy, Wickham's Fancy, etc., – not meaning fancy in our colloquial sense at all, but indicating its birth in the fancy of the fly tyer.

One of the best of these "fancy" flies, though not so called, is the Professor. It was designed by Professor James Wilson, of Edinburgh University, who was on a fishing trip one day without flies. To bridge the terrible gap, he pulled a thread out of his sock, and with it he bound on his hook the petals of a buttercup, and some wisps of grass, brown and grey. It was quite successful, so it became the "mock-up" for a regular fly made from the same colored fly tying materials. The "Professor" is still a favorite fly after more than a century of use.

Nowadays, most fly fishermen carry from two dozen to two or three hundred patterns, all of which will presumably take fish – or vice versa. Invariably the sportsmen have three or four real favorites with which they do nearly all of their fishing. And certain to be among the favored few is the Royal Coachman. The original Coachman was first tied by Tom Bosworth, who was the king's coachman. He could not fish in the king's stream, but he could tie a fly for His Majesty.

When the king came back to his coach one day, after not having done so well, Tom presented him with



Delicate in their appearance but a lot stronger than they look, flies usually resemble insects. Each is fashioned by hand

his latest creation, which was a brown hackle fly with peacock herl body (which was already well known) to which he had added a pair of white wings. The fly turned the day into an unqualified success for the king, so His Majesty, out of sheer gratitude, perpetuated Bosworth's memory in an anonymous sort of way by naming the fly the "Coachman."

A full peacock herl body, upon becoming wet, expands and becomes rather loose. It is then quite likely to snag on something, break, and unwind. John Haily, a fly tyer of New York, had a customer who liked the Coachman above all others, but he disliked its propensity to come apart.

"Royal Coachman"

After giving the matter due thought, this customer came up one day with an advanced idea about reinforcement. He wanted his Coachman flies bound about the middle of the body with silk floss. As a little touch of rugged individualism, he demanded that the sash be red. The magnificent appearance of the resulting fly led to the chance remark that it should be called a "Royal Coachman."

Theodore Gordon, of Pittsburgh, was the first great American apostle of dry fly fishing as it is practiced today. Being observant and thoughtful, as well as a skilled fly tyer, he became the first great American "special effects man" of the angling fraternity.

In his endeavors to make a dry fly come down lightly on the water, he developed the fanwing construction, which was in effect a built-in parachute. It is accomplished through the use of the curved breast feathers of appropriately colored ducks, and it gets results. Gordon also pioneered in the development of dry fly patterns to match the insects of the American streams. His Quill Gordon is in nearly every fisherman's kit.

Recent developments of importance in the dry fly art seem to be centered principally about the matters of body and trim materials which retain their floatability even after numerous casts or after catching one or more fish. Rube Cross made a good move in his Cross Special by making the body from raffia, which is tough and buoyant. Some tyers are now making tapered body dry flies using small amounts of kapok under the body dressing. Increasing numbers of thick-bodied flies are also being made from deer or caribou hair.

Furthermore, there is also a definite trend away from the soft fragile tails of the past. Hackle fibers, hair, and other stronger and stiffer substances are replacing the mallard and wood duck fibers formerly used. They give the fly better buoyancy at the tail, which is an engineering refinement long needed.

Trout are not entirely insectivorous. The larger ones are all cannibals when they have the chance. Good imitations of minnows are made from feathers and hair, and here again the materials come from widely scattered sources. The great thrill of trout fishing, of course, lies in the way the fish rises to dry flies. Quite a lot of the time, however, the trout gets more food off the bottom than from the top. Its staple groceries, then, are the nymphs which grow among the stones and rubbish and in the mud of the stream bottom.

Artificial nymphs which are truly imitative of the abundant stream life have been available for years. Some of the best were developed by E. R. Hewitt. Ray Bergman is responsible for another good series, some of which are made with translucent cellophane bodies.

Fishing with these nymphs properly is difficult. They must be used close to the bottom, and the third dimension of depth and the intervening currents all add to the complications. The nymph must also drift naturally, or the suspicious trout will surely blackball it.

There are some highly polished practitioners of the piscatorial art who always prepare a new wet fly for use by stamping it in the mud a few times before casting it out to fool the fish. A. E. Low, the previously mentioned fisherman of Santa Barbara, Cal., is that way – and he should know. The Nympho fly, which he designed, when so treated, enabled one of his fishing friends to win ten one hundred dollar bets that it would catch more trout than any other fly on the stream.

ETC 24052

WHERE DOES THE FARMER STAND NOW?

By John W. Roberts

Editor's Note: The farmer, as everyone knows, constitutes an important market. His wants and needs include everything from tractors, farm machinery, automobiles, trucks and tires to clothing, radios, washing machines, and gasoline and other refined products. As an indication of the farmer's importance in the total economy, there is, surprisingly enough, more mechanical power on farms than in all the plants and factories of the nation.

Because of the universal interest in the farm market, the following article is presented. In it the author compares the farmer's position today with that following World War I. The opinions expressed, of course, are his own.

LAST MONTH, as farmers began planning their Spring planting operations, a big question loomed in the minds of many people: How would the farmers fare in 1949? For more than a decade, the farmers have turned in consecutive bumper crops – several of them of record proportions. Meanwhile they have enjoyed a continually rising income. Thus, people asked, would 1949 continue their skein of high production and high income, or would it perhaps prove to be a turning point?

Underscoring that question was the recent action of the commodity markets.

Farm prices last month suffered a sharp decline in the nation's trading centers. Prices in some cases fell even below the government support levels – the levels at which the federal government, through its Commodity Credit Corp., stands ready to make loans on various commodities. At their February low point, cash wheat in Chicago sold as much as 15 cents a bushel below the government support level; cash corn sold as much as 40 cents a bushel below. As that happened, people began to wonder whether the farmers faced a situation comparable to that following World War I, when that era's postwar inflation ended in an abrupt collapse.

After that war, farmers suffered severely.

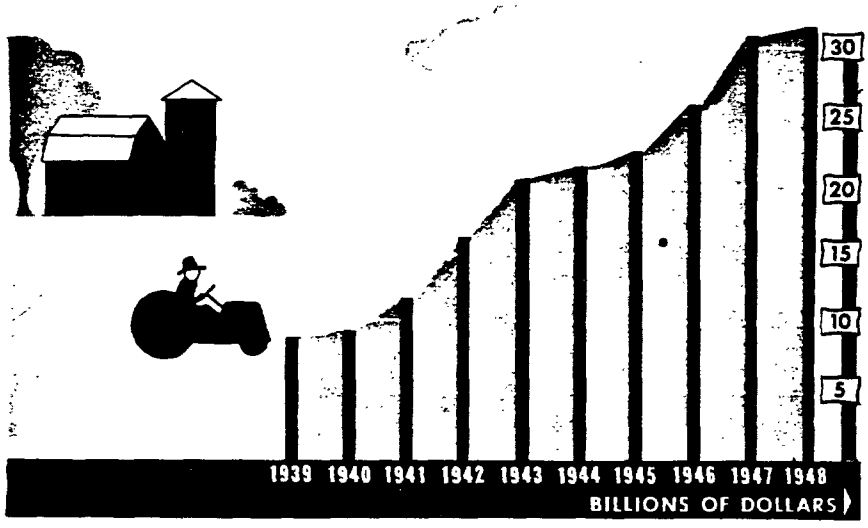
Between May, 1920 (the peak of the postwar inflation) and June, 1921, farm prices plummeted more than 50%. Cash farm income fell from $14.6 billion in 1919 to $12.6 billion in 1920 and to $8.1 billion in 1921. Meanwhile, farm mortgage indebtedness had piled up to record proportions as farmers expanded their acreage. Interest payments on that indebtedness, which in 1919 took a puny 3% out of farmers' lush earnings, now required more than 8% of their reduced income, and were hard to meet. Unable to pay their obligations, thousands of farmers lost their homes in the debacle of the early 1920's.

The Situation Today

This time, however, the farmers' situation is vastly different. Instead of being completely vulnerable to whatever readjustments may eventually follow, they are in a strong economic position.

As of the end of 1948, the nation's farmers owned more than $22 billion in liquid assets alone. Those assets – consisting of cash in the bank, holdings of government

ETC 24053



The unprecedented demand for farm products is reflected in the record of cash farm income (including government payments), which has steadily mounted in the last decade

bonds, and investments in farm cooperatives – were more than four times as large as the $5 billion in ready money farmers had back in 1939. Added to those liquid assets were the farmers' physical assets – meaning their real estate, crops, livestock, farm machinery – which brought their total agricultural assets up to $130 billion, compared with only $54 billion as of the end of 1939.

Against those $22 billion in quick assets in 1948, farmers had outstanding a total of $11.3 billion in liabilities, of which some $5.1 billion represented real estate indebtedness. In other words, their liquid assets were twice as much as their outstanding liabilities and more than four times as great as their real estate indebtedness. This situation is completely the reverse of what prevailed back in 1939, when farmers' outstanding indebtedness of $10 billion was twice as large as their liquid assets.

Meanwhile, farmers have increased their ownership of land and machinery. Since 1940, they have more than doubled their ownership of farm machinery and equipment. The three million farm tractors now in use, coupled with their other modern equipment, have enabled farmers to produce more efficiently and economically than ever before. Reflecting this, the productivity of agriculture in the past decade has outstripped the gains made in industry, measured by output per worker.

Today, what happens to the American farmer is of importance to everyone. Not only does he supply the nation with food and fiber; he is also an important customer for everyone else – buying everything from automobiles, tractors and gasoline to clothing, radios and washing machines. Thus, the welfare of the country at large depends, in no small measure, upon the welfare of the farmer.

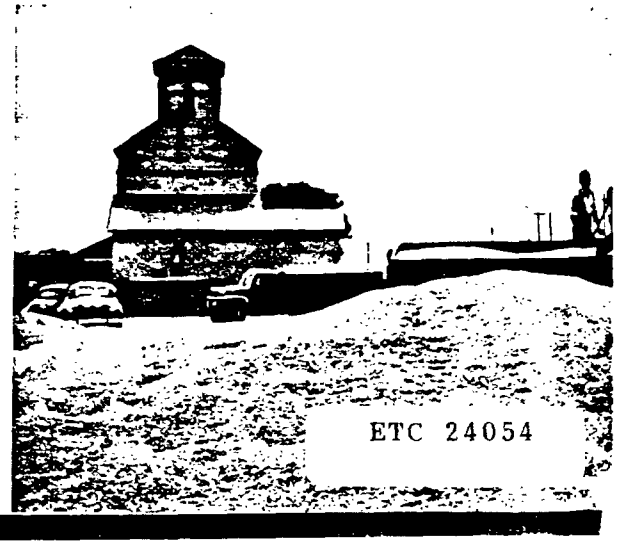
In gauging farm prospects, something that is sometimes overlooked is what determines farm income. Farm income is determined not only by the general level of prices but also by the volume of agricultural production. The experience of last year provides a vivid example.

Last Year's Experience

Back in February, 1948, farm prices also took a nose-dive – just as they did this past month. For 1948 as a whole, farm prices declined an average 13%. Despite this, cash farm income actually rose in that period – from $30.6 billion in 1947 to $31.3 billion in 1948 – while

Cattle losses caused by the past severe winter will affect the 1950 meat supply

The record harvests of last year severely taxed the nation's grain storage facilities



realized net income (cash income less production expenses) declined only a modest 2%, going from $17.8 billion in 1947 to $17.4 billion in 1948. The reason for the farmers' excellent showing in 1948, of course, was the record volume of crops produced.

Thus, in planning their 1949 operations, farmers know that how well they fare will depend not only on the prices they receive for their products but also on the volume of crops they can produce and dispose of. At the same time, they have recourse to the government's parity loans and purchase programs, which guarantee them minimum prices for the majority of their crops. The government's support program still continues to be of major importance to farmers, especially this year, despite the recent market fluctuations.

In a recent forecast, the Department of Agriculture declared that "though the peak may be passed, agriculture will continue to do relatively well in 1949." A private estimate of cash farm income this year, after allowing for the price changes last month, places it around $27 billion. This estimate, if borne out, means that farmers will enjoy a larger income than in any previous year excepting 1947 and 1948. By comparison, the farmers in the years 1935 to 1939 had an average income of only $8.5 billion.

Looking back over the past several years, it is interesting to see what changes have taken place in agriculture — and what they hold for this year.

After this war, as after the last, farmers were called upon to produce an unprecedented amount of foodstuffs, not only for the American public but for the war-stricken peoples of the world.

Turned in Bumper Crops

To meet these needs, farmers turned out the greatest flood of food and fiber in history. Last year, for example, they produced about 1.3 billion bushels of wheat, which was almost double what they grew before the war. They harvested a record 3.6 billion bushels of corn against only 2.5 billion bushels in 1939. They grew nearly 15 million bales of cotton against only 11.8 million bales in pre-war days.

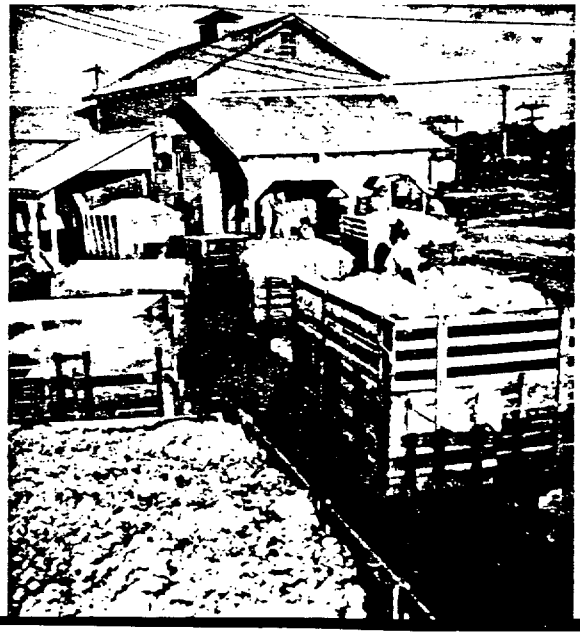
Mountains of American foodstuffs have been shipped abroad to feed the war-torn people of various countries. In grains, for example, the United States is sending abroad nearly 700 million bushels in the current fiscal year. This is about 14 times as much grain as the United States normally exported before the war.

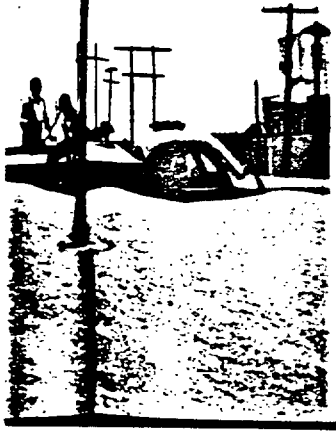
But in the past year, foreign agriculture has scored a vigorous recovery. European nations have been able to restore their own farm lands to production, and aided by good growing weather, have enjoyed near-normal harvests. Thus, while these countries are still receiving large shipments of American foodstuffs, that demand is expected to decline in the next season. The likelihood of lower exports, coupled with the record crop production here at home and the prospects for another good crop year in 1949, is currently making itself felt.

But while our bumper crops, present and prospective, may create new problems — not the least of which is adequate storage space — they are not without their benefits. An easy example of this is seen in corn.

Exports of American farm commodities to Europe have been a major factor in its recovery

Last year's cotton crop, at nearly 15 million bales, was well above the pre-war average





ETC 24055

Unlike wheat and cotton, corn is not a cash crop. More corn goes to market "on the hoof" than in its natural state. In fact, nine-tenths of it is fed to livestock and to poultry, thereby showing up in the market in the form of livestock, dairy and poultry products.

Two years ago, the nation suffered from an extremely short corn crop of only 2.4 billion bushels. The result was that farmers had far less feed to give their livestock and poultry, and they had to reduce their herds and flocks.

Last year, however, saw an unprecedented corn crop of 3.6 billion bushels, with record-breaking yields per acre. With more than ample supplies of feed now available – and at lower prices – farmers this year are planning on increased production of livestock, poultry and dairy products.

Effects to Date

The increased supplies of corn have already had an important effect.

Cattle feeders at the turn of the year had a record number of animals in their feed lots, 19% more than a year ago. Hog farmers are sending to market a larger number of 1948 Fall pigs than was previously indicated, and are planning a still larger increase in this year's Spring pig crop. Commercial hatcheries have been raising 50% to 60% more baby chicks than a year ago. Furthermore, despite smaller cow herds and smaller hen flocks than a year earlier, egg and milk production has continued steadily ahead of last winter. Strange as it seems, the milk production per cow, and the egg output per hen, have been the highest on record, due to the intensified feeding.

What all of this means is that farmers will have more pork, chickens, turkeys, eggs, milk, butter and cheese to sell in 1949 than in 1948, thanks to the enormous corn crop of last year. The principal exceptions to larger animal supplies will be in beef cattle, calves and lambs. The severe winter, just past, will hurt the 1949 calf crop, reducing veal supplies next year and beef supplies in 1951. These cattle losses, however, will have little effect on this year's beef supply.

Outlook for Consumers

Taking a look at food supply prospects and at potential buying power, the Department of Agriculture estimates that the average American will eat about as well this year as last. While showing only small changes from 1948, the estimated per capita food consumption for this year is far and away ahead of what the average American consumed in pre-war days, almost without exception.

At the present time, 1949 promises to be another year of bumper crops, assuming a continuation of good growing weather. Larger acreages are expected to be planted to wheat, corn and cotton, among other commodities. Early growing prospects have been favorable. Even the severe winter weather of the west has not been altogether harmful. Despite the hardship and misery it caused, it was also responsible for putting more moisture into the ground in many areas where it was needed.

Then and Now

The broad transition from war to peace – from an era of worldwide shortages in farm commodities to one of abundance and growing surpluses now – is not likely to affect the fortunes of the American farmer anywhere nearly as severely as it did back in 1921. Then he saw wheat prices plummet from a peak of $3.50 a bushel to $1.18, corn prices drop from $2.36 down to 53¢ a bushel, cotton prices fall from 42¢ to 12¢ a pound – and there was nothing he could do about it. This time, however, he has the protection of the government's price support program, which has tempered the price declines thus far.

The federal farm price support program, enacted during the war, guarantees the farmer loans at 90 per cent of the parity level for the six basic crops: wheat, corn, cotton, rice, tobacco and peanuts. Under present authorization, these loans can be made through the end of the next marketing season, which means that this year's crops are so protected.

Currently, Congressional hearings are underway concerning the government's farm price program for next year. Whatever final action Congress takes will determine, to a large extent, how much of farm income will be underwritten by the non-farm population of the country next year. Meanwhile, however, the farmer's position is very different from the situation that confronted him in the early 1920's.

OUR PICTURES

Pages 3, 4, 6, Philip Gendreau; Page 5, courtesy of Toy Guidance Council; Pages 7-9, cartoons by Rodlow Willard; Pages 10, 11 (right center and bottom), International News Service; Page 11 (top right) courtesy Union Oil Company, (left center), courtesy Super Service Station; Pages 12, 15, 19, 20, 21, Press Association; Pages 16-18, courtesy of Carl Abell.

ETC 24056

NEW QUARTERS AT BATON ROUGE

The plant doctors, nurses and a large part of the administrative personnel at Baton Rouge are settling down in new quarters this month, following the completion of the new Medical and Personnel Building in February. Part of a building program started before the current expansion of manufacturing operations, it is designed to provide improved facilities and services for employees, and to give the administrative staff more elbow room.

The Medical and Personnel Building faces the highway leading to the plant. It has a recessed entrance with plate glass doors opening on the principal parking lot directly East of the main gate.

Within easy distance of each of the three manufacturing areas, it is next to the cafeteria and near other employee units. The strategic location of the building makes it convenient for Ethyl personnel and visitors alike. Behind the structure, in the right background, is the plant's sixth tetraethyl lead building which is now under construction, and will be completed this Fall.

Offices, laboratories and other facilities of the Medical Department are located in the wing facing the parking lot. The department has physiotherapy, electrocardiograph and basal metabolism rooms, equipment for taking and reading X-rays, accommodations for first aid treatment and minor surgery, and for temporary hospitalization. A medical library is also being installed.

Personnel services and activities have been grouped together in adjoining quarters in the East wing of the ground floor. John H. Schaefer, vice president and general manager of manufacturing; Clinton W. Bond, resident manager; and B. Bynum Turner, assistant resident manager, are among those on the plant's administrative staff with offices in the new building. The Finance Department occupies most of the second floor.

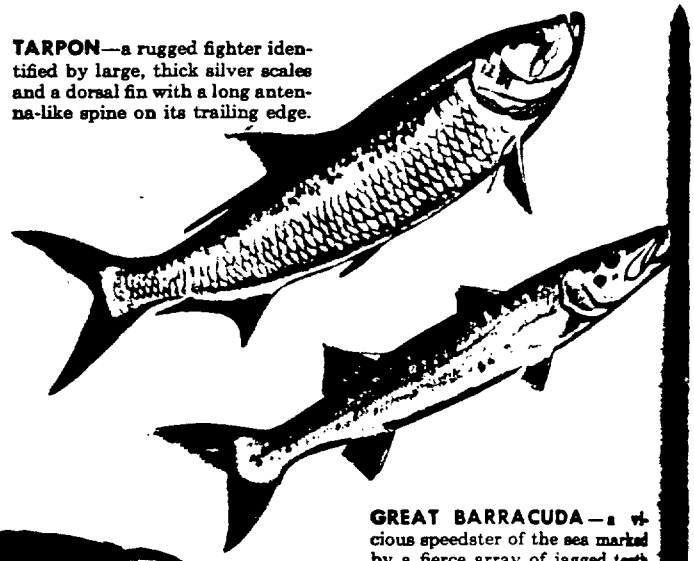
The new building has 119 rooms equipped with summer and winter air conditioning, indirect lighting, and acoustical walls and ceilings. The streamlined brick exterior blends with the architecture of other modern plant units nearby. A feature of its construction is the provision for a third floor to be added if more room is needed at some future time.

When you go winter fishing

THE "TRADE-MARKS" OF NATURE*

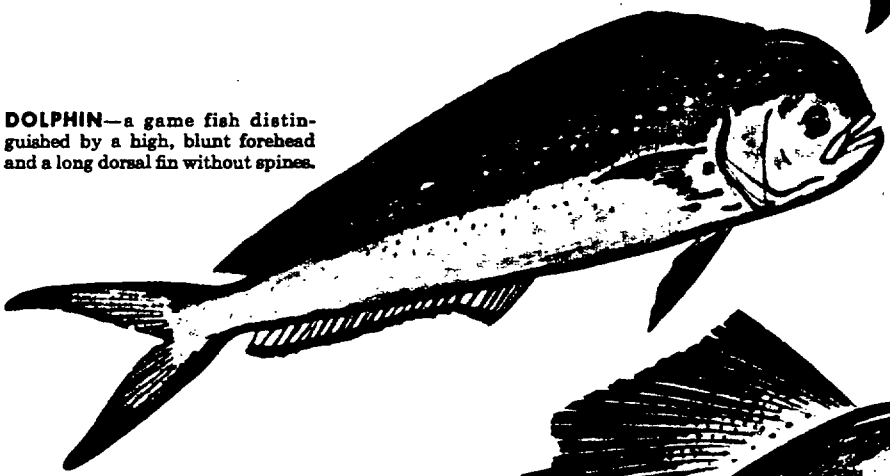
identify the fish you catch

*Prepared in cooperation with specialists of American Museum of Natural History, N. Y.

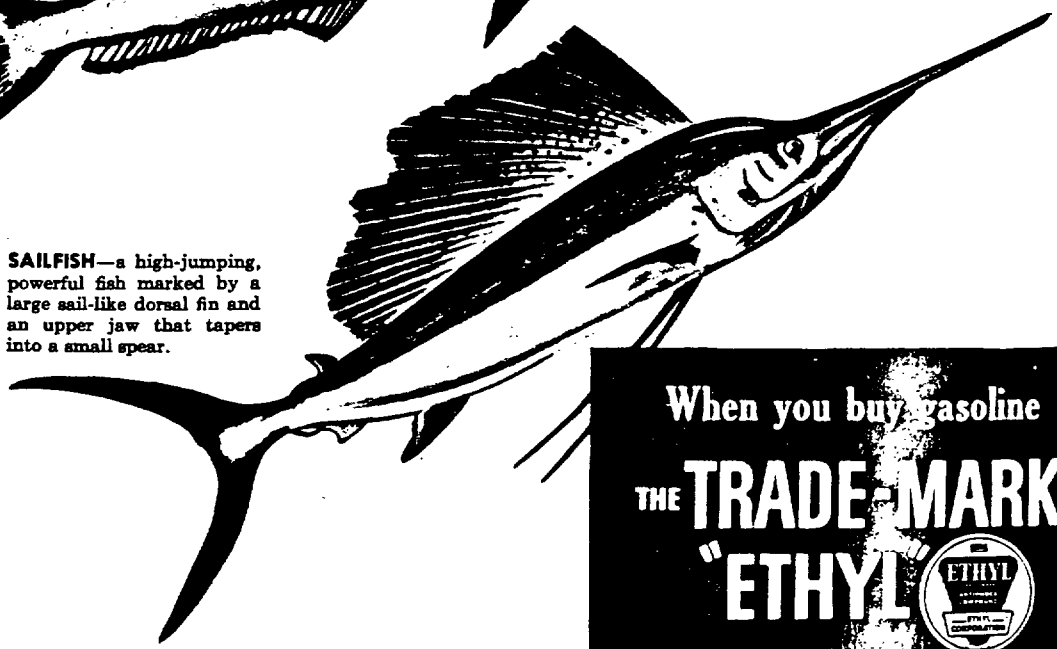


TARPON—a rugged fighter identified by large, thick silver scales and a dorsal fin with a long antenna-like spine on its trailing edge.

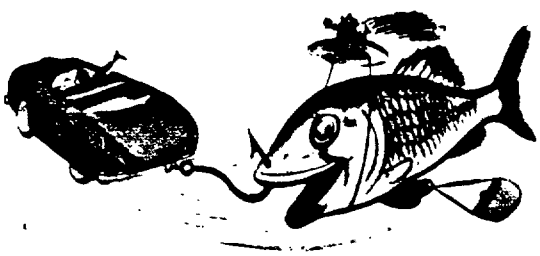
GREAT BARRACUDA—a vicious speedster of the sea marked by a fierce array of jagged teeth set in a pointed snout.



DOLPHIN—a game fish distinguished by a high, blunt forehead and a long dorsal fin without spines.



SAILFISH—a high-jumping, powerful fish marked by a large sail-like dorsal fin and an upper jaw that tapers into a small spear.



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identifies gasoline improved with "Ethyl" antiknock fluid

ETC 24058

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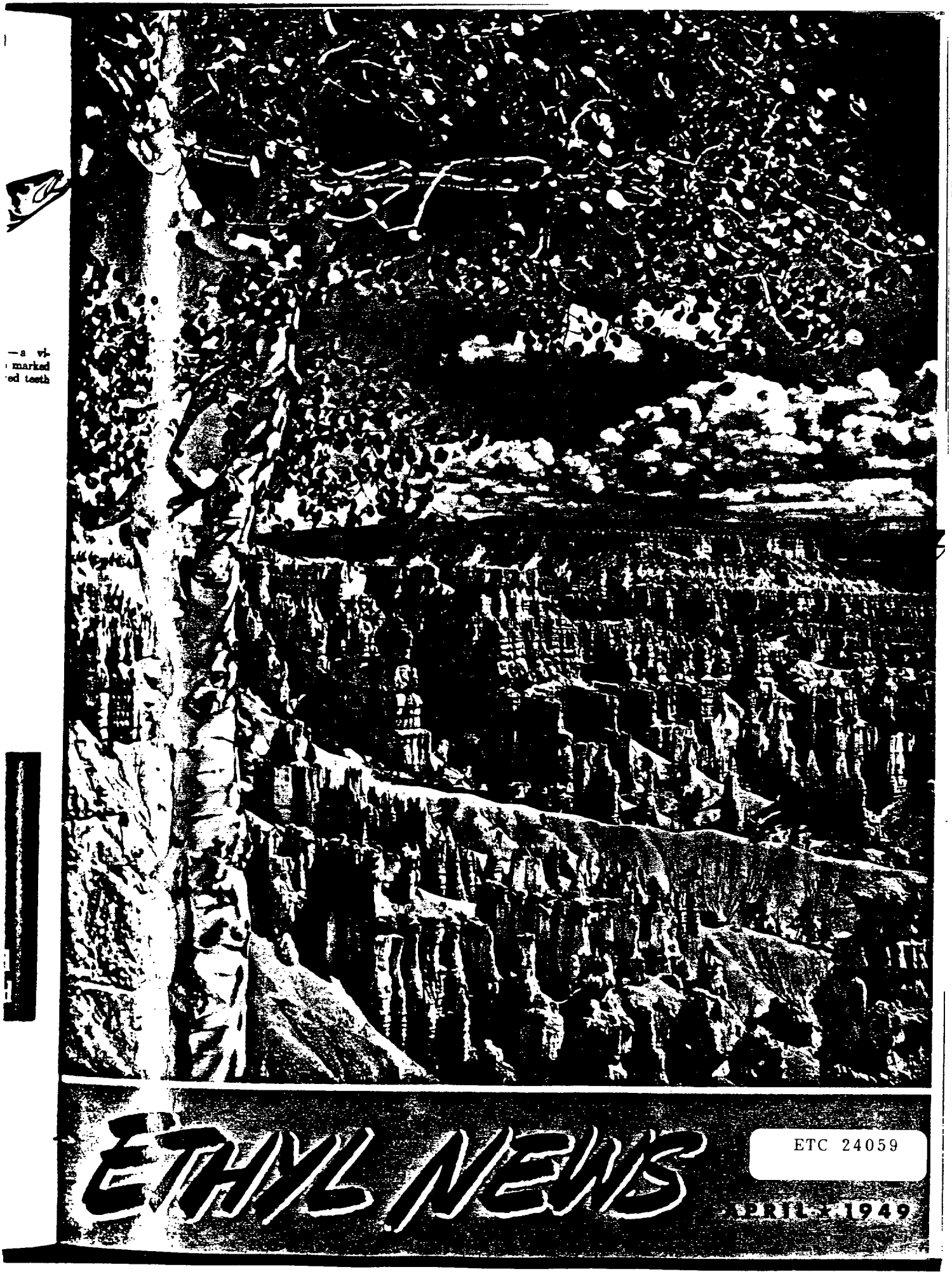

ETC 24059

In connection with the entrance of Ethyl Corporation into the manufacture and sale of benzene hexachloride and other chemical products, Dr. Charles L. Smith, an entomologist, has been appointed to the staff of the Product Development Department.

Dr. Smith comes to the Ethyl Corporation from the National Agricultural Chemicals Association, formerly the Agricultural Insecticide and Fungicide Association where he has served for the past four years as Technical Advisor. In the two preceding years he was a research entomologist at Rutgers University under a Fellowship from the Carbide and Carbon Chemical Corporation.

Dr. Smith, a native of New York State, attended Rutgers University, where he received his B.S. degree in 1933, his M.S. degree in 1934 and his Ph.D. degree in 1937.

As a member of the Product Development Department, Dr. Smith will work with the automotive, agricultural, pulp and paper and other industries in the development and use of chemical products manufactured by the company.

Benzene hexachloride — called BHC for short — is produced at the company's manufacturing plant in Baton Rouge, La., and is being sold to the insecticide industry for conversion into concentrates and dusts in combating many agricultural insects. BHC has proved to be especially effective in control of the boll weevil and other cotton pests.

IN THE

ETHYL NEWS

APRIL 1949

THE ROAD TO BETTER HIGHWAYS 3

How should the nation's highway needs be met? What policies should govern highway taxation, finance and administration? How can highway barriers and other inequitable restrictions on motorists be eliminated? This article tells what is being done, on behalf of the nation's motorists, by the National Highway Users Conference.

NATION ON KEELS 8

Today, the number of motor boat enthusiasts is listed in the millions. A big reason for this unprecedented popularity lies in the large number of inexpensive craft which have put motor boating within the reach of nearly everyone.

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In order to widen the fields of reader interest in Ethyl News, we frequently publish articles contributed by writers not associated with Ethyl Corporation. Opinions expressed in signed articles are the authors'. The editors of the News welcome articles of timely interest submitted from outside sources.

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Manufacturer of "Ethyl" antiknock compound, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, secretary

ETC 24060

The Road to Better Highways

Helping to promote highway progress in the public interest is the aim of the National Highway Users Conference

SEE THAT MAN driving along the highway in that sleek new convertible? A passenger car owner, you say? Sure he is, and he's also a highway user. Here comes a driver pushing along a big truck-trailer combination. An over-the-road trucker? Yes, and a highway user, too. In that stream of vehicles rounding a curve, you can see a farmer headed for market, a bus driver taking people cross country, a milkman headed for the next town, a doctor out on a round of calls. They're all different classes of motorists, and yet they're all highway users.

In short, everyone who owns or uses a motor vehicle is a highway user – and they all have a vital stake in what happens to our highway system.

Nor does the analogy stop there.

Take that same strip of highway, and what does it represent?

To the farmer, that highway provides a swift means of transporting his vegetables to town. To a home owner, that highway means quick access to and from his job – and has a direct bearing on the value of his property and the welfare of his community. To virtually any business or industry, that highway represents a means of obtaining raw materials readily and of shipping out its finished products again. To the nation, that highway can be an important artery for commerce and people, essential in peace, invaluable in war.

Clearly, then, the welfare of our highways is of common concern to everyone, whether he lives in the city or lives in the country, owns a car or rides a bus, works for a living or is in business for himself. There isn't a single person whose life, in one way or another, is not affected by our highways and what happens to them.

Recognizing this, a unique nationwide organization was formed some 17 years ago. That organization, called the National Highway Users Conference, was established to promote the full development of highway transportation in the public interest. With a membership drawn from every group interested in high-

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way transportation, the National Highway Users Conference set as its goal the endorsement of policies which would benefit all classes of highway users and promote sound highway progress.

Barriers to Progress

When the Highway Users Conference was formed, the country was mired in the depression. Highway transportation stood to play a major role in contributing to the nation's recovery, but many serious road blocks were in its way. There were all too many laws still in force which were as out of date as the touring car and two-wheel brakes. There were many inequitable restrictions upon motorists, among them the highway barriers erected between states. And there had been, as the depression developed, a growing diversion of highway funds to other than highway purposes.

One of the principal founders of the Conference was Alfred P. Sloan, Jr., chairman of the board of General Motors Corp., who served as chairman of the highway users group until last year, when he was succeeded in that capacity by Albert Bradley, executive vice president of General Motors. In a statement of principles at the time the Conference was founded, Mr. Sloan listed the following among its major objectives:

1. To encourage the full development of highway transportation in the public interest.

2. To promote sound public policies of highway use, development, safety, taxation, finance and administration.

Since that time, the Conference can point to substantial progress in many directions.

Through its efforts, and those of cooperating agencies, sound highway legislation has been enacted in many states. A greater awareness of the importance of long-range planning for the construction of highways and bridges is evident among states. The great number of highway barriers has been reduced, and progress has been made in developing uniform traffic laws. Moreover, the Conference has sought to keep motor vehicle taxes at an equitable level – consistent with highway users paying their share of highway costs, and consistent with their ability to pay for adequate highway facilities.

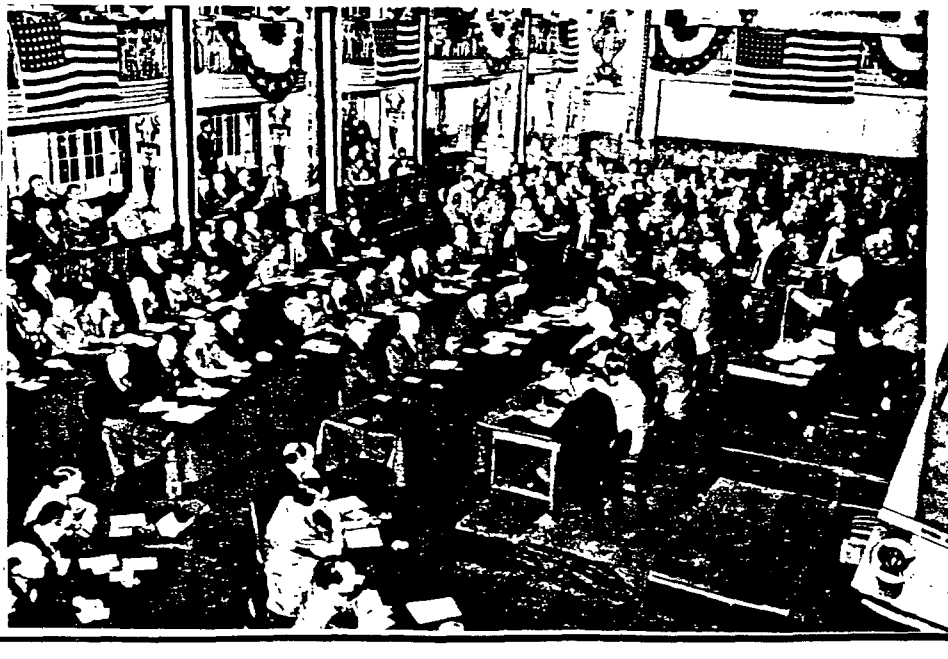
Meanwhile the Conference has, on behalf of the motoring public, disproved various claims of highway subsidy, and it has acted to protect highway funds against their diversion to non-highway uses and against their dispersion among unjustifiable construction projects.

In seeking to promote sound highway progress, the NHUC has had to cope with many complicated issues.

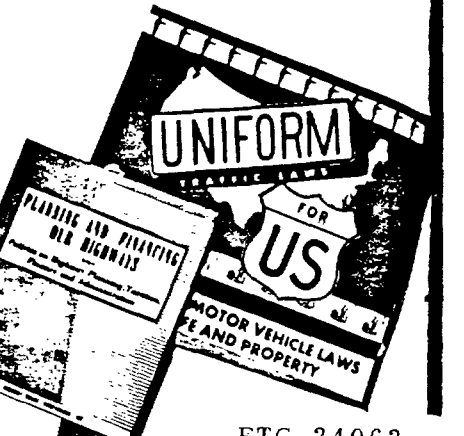
For example, the administration of our network of highways is primarily the function of the state, county and municipal governments, with the federal government cooperating in making available funds for the federal-aid highway systems. Many people know this, but they do not always realize its consequences.

Wide Variations

With each state a law unto itself, there is a wide variation on such vital matters as taxation, traffic codes, highway safety and highway planning. To take an easy illustration, the lack of a uniform traffic code is reflected in the dividing lines of various state highways ranging all the way from the use of three lines in some states to no lines at all, while at least one state uses a "center" line, not to divide the highway,



Left, a Highway Transportation Congress sponsored by the N.H.U.C. . . Below are representative programs arising out of such public forums



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but to denote the center of each driving lane.

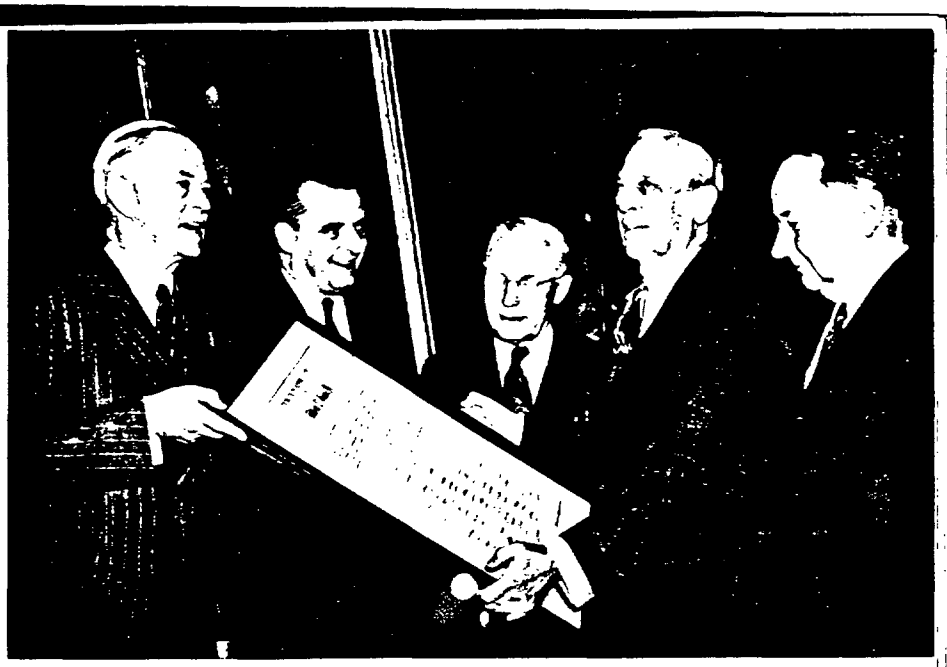
Once again, suppose an over-the-road trucker was taking a shipment from Michigan through Ohio and then down into Kentucky. In Michigan, his allowable gross load is 120,000 pounds, but in Ohio it is only 77,250 pounds, while in Kentucky it is only 42,000 pounds. Varying restrictions such as these prevent the full, economic use of both highways and vehicles.

On the other side of the fence are the highway users themselves, meaning the motoring public as a whole. Everyone is interested in more and better highways, but not everyone is agreed as to how they can and should be accomplished. A proposed new super-highway, let us say, may appeal to a given class of motorist, but that does not necessarily make it an ideal solution to a traffic problem. Nor are various road improvements which are suggested in all cases consistent with the ability of the taxpayers to pay for them. Obviously, the real test of any program is whether it will benefit all classes of highway users and be an economically sound venture.

Role of the Conference

For these reasons, the task of the NHUC has been one of cooperation, research and education — exploring long-range problems, defining current issues, and endorsing measures which will be in the public interest.

Accordingly, one of the major functions of the Highway Users Conference is to act as a clearing-house of information on all matters of legislation, regulation and taxation of highway transportation. Further, it serves as a forum for policy discussions and the development of voluntary programs concerning highway transportation, and it assists



Alfred P. Sloan, Jr., receiving a scroll of appreciation for his services to the N.H.U.C. Shown with him are Arthur M. Hill, president of the National Association of Motor Bus Operators; Arthur C. Butler, director of the N.H.U.C.; Albert S. Goss, master of the National Grange; and Albert Bradley, executive vice president of General Motors and present chairman of the N.H.U.C.

in carrying out the programs agreed upon. Moreover, it aids state highway user groups in carrying forward their individual programs, although the state conferences remain autonomous bodies. Through all of these means the Conference seeks to promote sound public policies of highway use, development, safety, taxation, finance and administration.

Today, as it tackles current highway problems, the Conference faces issues of paramount importance. As Mr. Bradley, the NHUC's present chairman, declared in a recent message, "The need for sound highway policies in the public interest to guide our highway program is greater than ever before."

Certainly one of the most pressing problems affecting the motoring public is the physical condition of our highways.

All told, the nation has some 3.3 million miles of roads and streets, half of which are surfaced roads and highways. It is significant, however, that 86% of all motor vehicle travel on rural roads is done on only about one-fourth of the 3 million miles of rural roads — the general use roads. The remaining 2.3 million miles of rural roads consist of land-service roads, whose chief function is to provide access to land.

The war years, as everyone knows, inflicted deep scars on our highway system, because of the inability to maintain and repair it properly, while postwar shortages of manpower and equipment have further delayed many needed repairs and improvements. Meanwhile, the record 41 million motor vehicles now in use, coupled with the unprecedented volume of traffic which has developed, have made the situation all the more acute.

Priority Schedule Needed

Aware of the many complexities of the problem, the NHUC points out that it is "physically impossible to satisfy all road needs simultaneously. In order to assure orderly development of the highway system in accordance with needs, a priority schedule should be established. This scheduling of improvements should be set up for the life of the program but should be subject to re-examina-

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tion at reasonable intervals in order to keep abreast with changing needs and conditions."

In planning for highways, one of the major recommendations of the Highway Users Conference is that each state adopt a long-range highway program, as some states have begun to do. Such a program should be based on a sound and realistic approach, the NHUC declares, "balancing actual and reasonably anticipated needs with ability and willingness of the taxpayer to pay the cost." The program should be formulated by an official highway study committee, the NHUC declares, which should be composed of members of the legislature, public officials, and representatives of organized highway user groups.

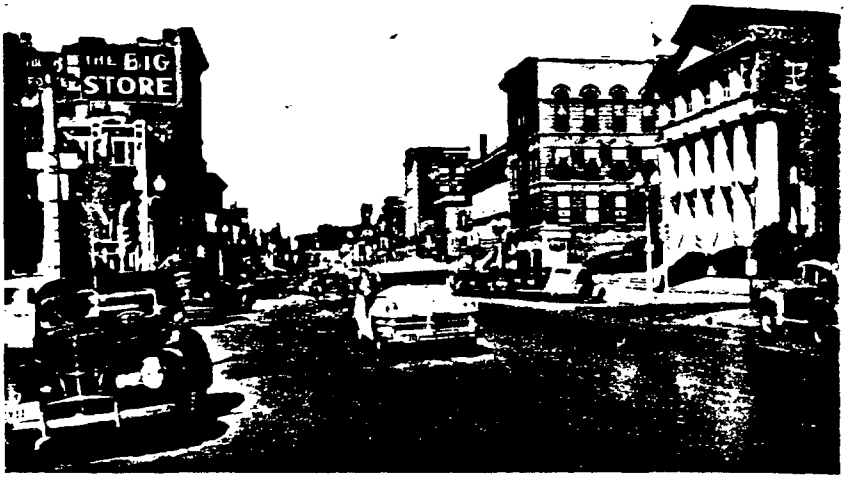
Paying for Highways

It is one thing to plan for highways. What about paying for them?

To finance their highway construction projects, the various states had on hand, as of the end of 1947, roughly $1 billion in highway funds (not including another $200 million earmarked for debt service on their outstanding obligations). During 1948, the states collected an estimated $2 billion in revenues from highway users. In addition, they received substantial grants from the federal government under the terms of the 1944 federal aid highway act and were in line to receive additional funds under the 1948 federal aid act. As of December 31st last, nearly $1¼ billion in federal funds, apportioned to the states, remained to be paid to the states under existing authorizations.

From the foregoing it is apparent that, generally speaking, state highway construction has not, and is not, hampered by lack of funds.

Meanwhile, highway users last year poured into the federal and state coffers an unprecedented total of more than $3.4 billion in taxes on motor vehicle ownership and operation. This tax total includes more than $2 billion in state highway user taxes and more than $1.4 billion in taxes (such as the emergency federal automotive excise taxes and various state sales and property taxes) for support of the general functions of the government.



Planning is important for big and little cities, as they look ahead to their future traffic loads

As high as these record-breaking revenues are, there are indications they may go even higher, if the present trend continues. A vivid example of this is seen in the federal and state levies on gasoline.

The average service station price of gasoline, in a recent month, was 20.09 cents a gallon, exclusive of taxes. Added to this was an average 6.38 cents in taxes, for a total cost of 26.47 cents a gallon. This average tax added nearly a third to the original cost of the gasoline to the motorist. Last year, two states increased their gasoline levies. Thus far in 1949, 25 states have introduced proposals to increase gasoline taxes, while another six are contemplating such measures.

Even without considering the effects of any changes in existing tax rates, highway revenues have increased tremendously in the last decade or so – and promise to go still higher. This is because existing taxes produce more revenue as highway volume increases.

As an example, the Highway Users Conference points to the state of Alabama, which since 1932 has levied a gasoline tax at a constant rate of six cents a gallon. In 1932, the Conference points out, that tax brought in $7,268,000 to the state; but by 1948, the yield from the same tax rate was $27,678,000. The increase in the last three years, the Conference adds, has been more than $11 million.

A Paramount Problem

Obviously, the motoring public has a real and serious interest in the unprecedented amount of money it is being called upon to pay and in what is happening to those funds. Furthermore, the situation underlies the significance of the efforts of the NHUC, and of related organizations, in seeking to hold these taxes to an equitable level.

In a statement of policy on motor vehicle use taxes, the Conference emphasizes that they should not ex-

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ceed a vehicle owner's proper share of the cost of highways. Nor, it adds, should they be excessive to the point of discouraging the use of motor vehicles nor should they exceed the ability of the motorist to pay. The levying of motor vehicle use taxes should be reserved to the states, it declares, and should not be practiced by the federal government, on the one hand, nor by the municipalities or other subdivisions of the states, on the other.

To safeguard highway funds, the Conference recommends that all motor vehicle use taxes and other road funds collected by a state be expended by or under the direction of the state's highway department. In that way, it is hoped, the public will be protected against the diversion of these funds to non-highway purposes and their dispersion to expenditures not related to sound highway planning. These practices, as the NHUC points out, constitute unfair multiple taxation upon motorists. In an analysis of the cost of diversion alone, the Highway Users Conference reported that, between 1934 and 1946, 95,313 miles of roads were lost to motorists because $2,038,460,000 in state highway user taxes was spent for non-highway purposes in that time. If the diversion figure, the NHUC adds, was applied to secondary roads alone, the mileage lost would be found to be many times larger. It is interesting to note that, in reflection of the work of such organizations as the Highway Users Conference, 21 states to date have passed anti-diversion amendments to their constitutions.

Toll Roads a Problem

At present, one problem the Conference finds of growing importance is the disposition of a number of states to build toll roads. The states in many cases have large highway fund balances, are receiving record-breaking taxes from motorists, and are assured of heavy federal grants for the next several years; nevertheless, a number of them are considering the expedient of toll road projects.

The Conference firmly opposes toll roads as basically wrong, "because the highway user already is taxed to provide revenue to build roads, and he should not be compelled to pay a further tax." In this stand the Conference is joined by the Public Roads Administration, which has denied the use of federal aid funds for the construction of toll roads.

Besides seeking to promote sound methods of planning and paying for highways, the Highway Users Conference is also carrying forward many other programs of action on behalf of motorists.

One is its continuing efforts to secure wider adoption of the Uniform Vehicle Code. This year, some 28 state legislatures are expected to consider legislation toward this end, and, it is hoped, many of them will take affirmative action. Another of its tasks is the full elimination of highway barriers, which can be accomplished, the NHUC declares, by complete reciprocal agreements between states. A third is the ceaseless effort to increase highway safety, to which cause the Conference is lending its vigorous support.

Today, while it tackles these and related problems, the Conference is also looking ahead to the future. Aware of our present highway needs, it is also cognizant of the fact that a greatly improved highway system will be required to handle the increased traffic load expected ten and twenty years hence. For that reason, it emphasizes the importance of long-term planning now. Only by such planning, it declares, can our goals be translated into a practical reality.

To meet all the war-deferred highway needs, the N.H.U.C. urges a priority schedule be set up

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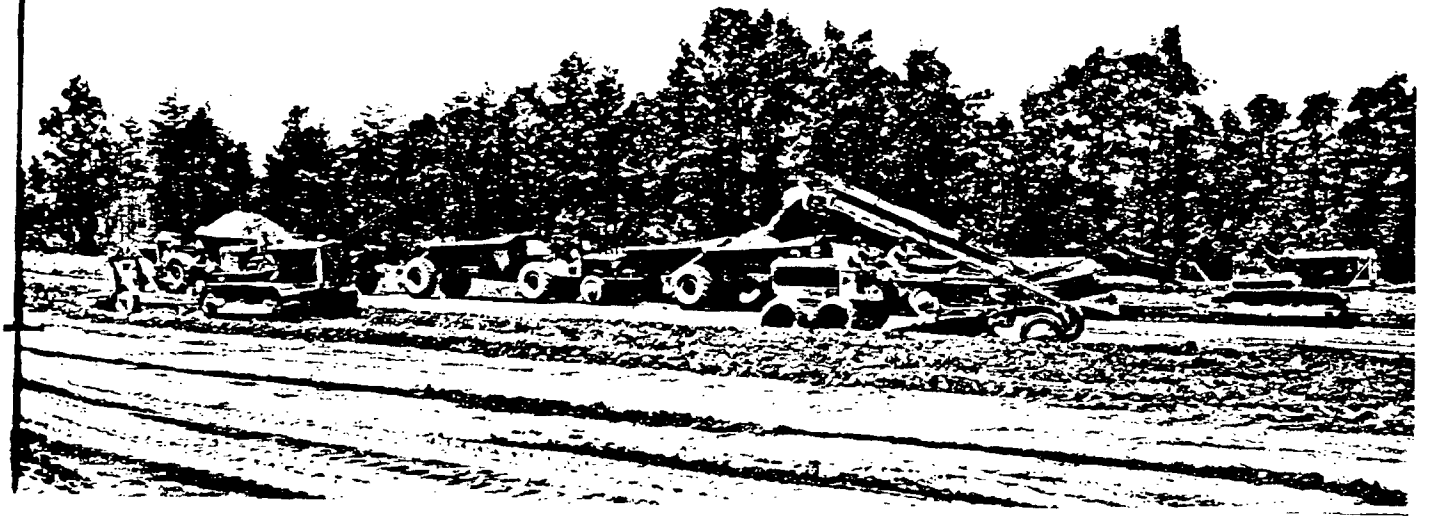


NATION ON KEELS

Large numbers of motor boat enthusiasts are joining the march to the sea now that craft are priced to fit almost any purse

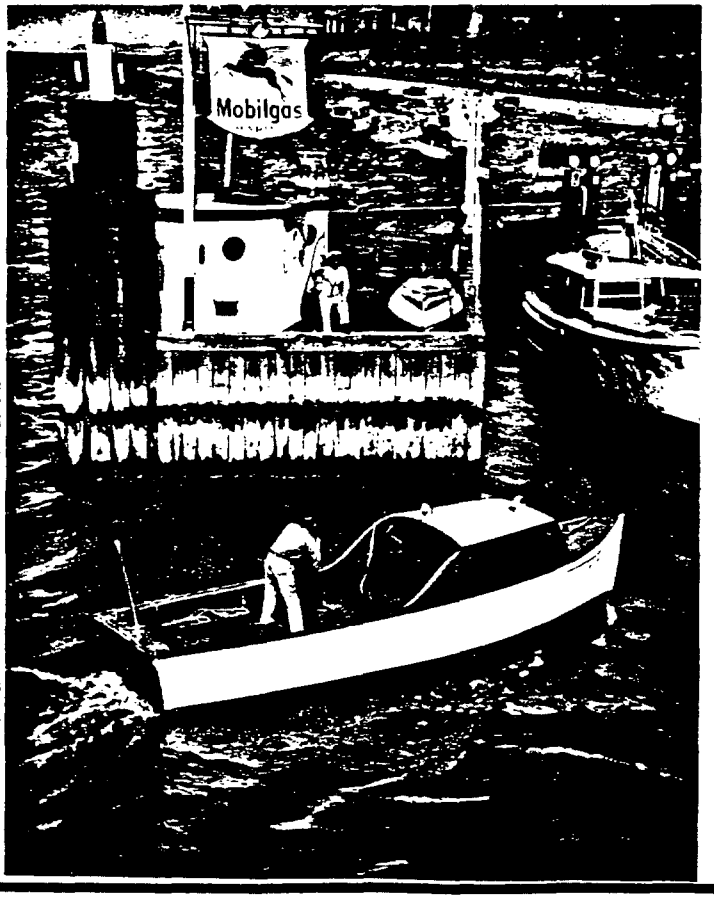
IF YOU WERE to visit any boat yard these days, especially on weekends, you'd find all sorts of people bustling about—sanding down hulls, poring over engines, and wielding a paint brush with lavish care. Garbed in old clothes and lots of enthusiasm, they're fitting out their motor boats for the coming season.

The average boat owner is a comparative newcomer to the sport. Owning a craft of moderate size, he may be part of that group which took to motor boating just before the war, when inexpensive models started the masses on their march to the sea. Or he may have worked up his maritime appetite while serving with the armed forces during the war. At any rate, his enthusiasm is such that he – and millions like him – have made the United States the greatest pleasure boating nation in the world.

As of the turn of the year, U. S. Coast Guard records listed 440,000 motor boats in the 16-foot class, 3,540 documented yachts, and millions of unregistered boats of all sizes. The growth of pleasure boating has been so rapid that last year 15 boat basin operators in the metropolitan New York area reported capacity business.

More boats have been made available to more people for the same reason that the United States is a nation on wheels. Mass production has put motor boats within reach of those who years ago never dreamed of becoming yachtsmen.

Incidentally, the yachtsman of today is not the man he used to be. Gone are his former trappings of gold braid, tea on deck at four, a smartly uniformed crew, and a genial captain. It was not unusual during the 1920's for a boat owner to have $50,000 or more tied up in his boat. Today this is the exception rather than the rule. Most boating enthusiasts own a small craft valued at less than $5,000. The name, yachtsman, is used loosely, but most people in the business feel that it now describes any boat owner who operates a craft capable of overnight voyages.

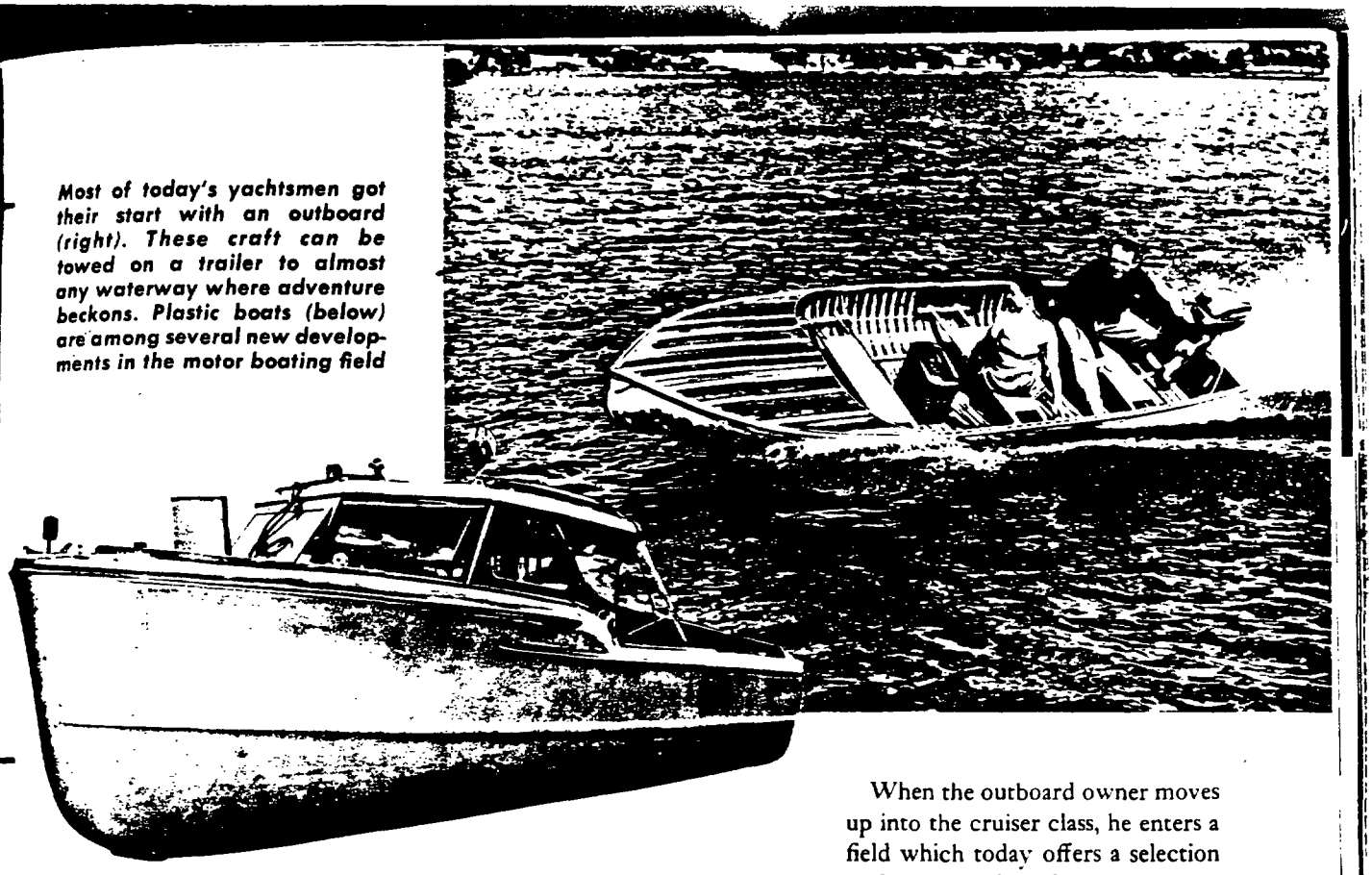


Many new marine service stations are in operation to provide motor boat enthusiasts with more convenient service

New Breed of Skippers

Commenting on the trend to smaller craft, Drake H. Sparkman, president of the brokerage and designing firm of Sparkman and Stephens, points out that for every big boat of 20 years ago, there are 100 smaller boats today. "That means many more people, on a more economical scale, are engaged in the sport." Mr. Sparkman also observes that our boating population is much younger than it used to be. "Not one sailor in ten seems over 30 today," he says. "A new and hardier breed of sailors is growing up."

Most of today's yachtsmen got their start with an outboard. And if post-war outboard motor sales are any barometer, the next few years will see the biggest boom in yachting on record. Since the end of the war



Most of today's yachtsmen got their start with an outboard (right). These craft can be towed on a trailer to almost any waterway where adventure beckons. Plastic boats (below) are among several new developments in the motor boating field

outboard motor manufacturers have produced over a million motors. Production in 1948 was three times that of 1941, and the number of "small boaters" now stands at 2½ million people.

Running an outboard, it seems, leads to a desire for bigger and better things. People in the boat business know that every outboard owner is a potential runabout purchaser, and every runabout owner is a prospect for a cruiser. There is no doubt that the outboard is a springboard to bigger things. It offers the owner of his first boat a chance to get his sea legs. But it also has some characteristics of its own that make it one of the most important things in boating.

The neophyte sailor can start out with just the motor alone. He can carry it in the back of his car and rent a boat at any one of thousands of points throughout the country. The cost of operation is very low, and if he's a sportsman he will be able to spend more time fishing or hunting and less time with the business of rowing.

Frequently the owner of such a simple outfit begins to look for interesting bodies of water that offer him cruising possibilities. He'll pick out a chain of lakes or a river, rent a boat, pack some food, and do a little simple cruising. This enthusiast is ripe for bigger things and, the chances are, the following year you'll find him touring the highways with a larger motor in his trunk compartment and a boat on a trailer in tow.

Outboard Tourists

This type of outfit can be taken anywhere an automobile can go, and is easily stored and maintained. About half of the owners of these craft find that their outboards and boats fill their needs. But the other half are beginning to think about overnight cruises and sleeping accommodations aboard ship.

When the outboard owner moves up into the cruiser class, he enters a field which today offers a selection undreamed of a few years ago. These craft are produced by assembly-line methods. Most of them are powered by gasoline engines. But even though the great majority are less than 35 feet long, they come completely equipped with bunks, galley, dinette, and toilet facilities. Many of them are capable of travelling from Maine to Florida, and all of them can navigate our extensive inland and intracoastal waterways.

Two recent developments in the cruiser field have been the advent of the metal boat and the plastic boat.

Small metal boats are not new, but only recently have they begun to win wide acceptance. New and better steels and aluminum alloys have been responsible for the improved craft. One line of metal craft ranges from a 20-foot utility boat to a new 35-foot two stateroom sedan. These boats sell for approximately the same price as comparable wooden craft, but they are claimed to be more resistant to shock and to require less maintenance.

The plastic boat is also being

watched with interest. Long before the war, attempts were made to produce a satisfactory plastic boat, but none of them was successful. During the war, however, thermosetting resins of the polyester type were sufficiently improved to make them acceptable as a boat material. These resins are fabricated with glass fiber mats in an aluminum mold under heat.

Boats from Glass

Since the war, a handful of boat builders have been turning out small glass fiber-plastic runabouts and dinghies. So far, they report, their customers are satisfied with the permanence of the product and the freedom from expensive maintenance. A boat made from this material is said to be leak-proof, wormproof, and corrosion-proof. It is not affected by heat, cold, salt water, fresh water or climatic conditions, and it can be stored outside without damage or kept in the water the year 'round.

Today's small craft, when compared to those produced before the war, show a marked trend toward greater efficiency. Engines are more compact and yet more powerful. This means, among other things, more room for passengers at no sacrifice in speed. One manufacturer of a six-cylinder engine features increased cruiser or runabout speed ranging from 15% to 30% with no appreciable change in power plant weight. One of these engines produces 225 h.p. and weighs only 1,200 pounds. Interestingly enough, it has a compression ratio of 8.5 to one. This is in keeping with the trend in marine engines. Compression ratios have been climbing steadily upward, and today ratios of more than 7 to 1 are quite common.

In addition to better boats and engines there are a growing number of services being made available at yacht basins and docks.

Marine Service Stations

Yacht club memberships cost a fraction of what they used to in years gone by. Petroleum products are being furnished by thousands of marine service stations located at strategic points along the nation's waterways. Many of these service stations provide repair service, sell marine hardware and groceries, and furnish water, ice, electricity, mail, telephone, and radio service. And in some harbors specially equipped boats cruise about selling snacks to yachtsmen.

In yachting circles you often hear amateur mariners use such expressions as "He's got the bug" or "The bug bit him." This means that a new enthusiast has been born. And any member of the industry will tell you that there is no salesman like a chap who "has the bug." One veteran boat owner observes, "There are so many bugs around these days, it's a wonder there are any landlubbers left."

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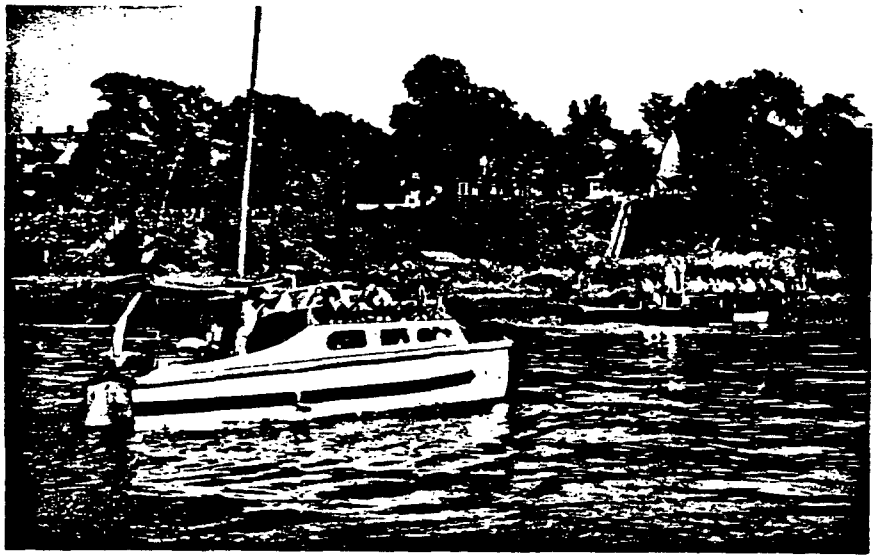

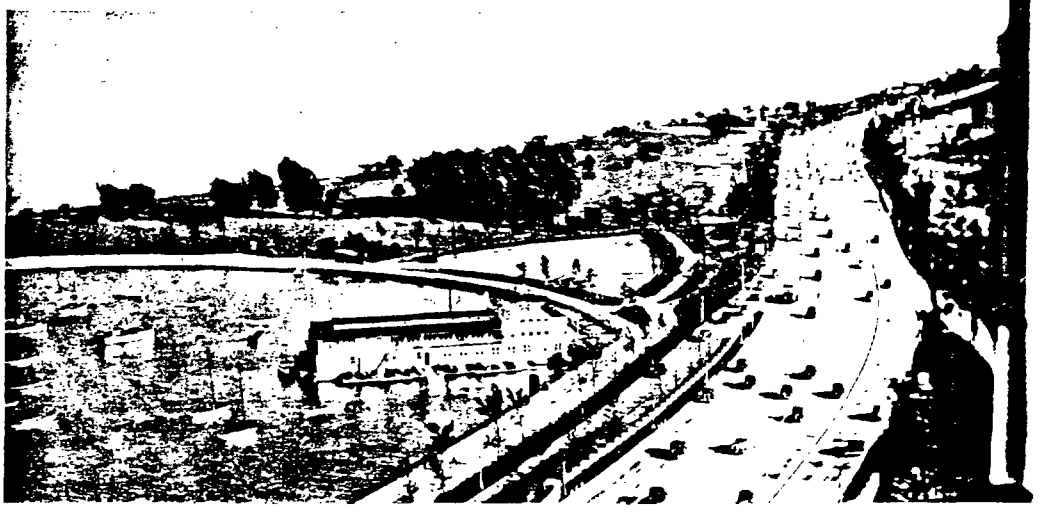

Waterborne refreshments are served up by craft such as this which ply dock and harbor areas. Right, Chicago's Belmont Harbor offers excellent dock facilities

GIVE A MAN A POT HE CAN BOIL!

Amateur male chefs, with whom cooking is a hobby, show real skill with a skillet

By Harry Botsford

THEY MAY NOT all admit it – but there's many a man who takes pride in being an amateur chef. They get a big kick out of whipping up anything from a favorite dish to a full-course meal. And not only do they enjoy the art of cooking, but they also enjoy eating what they cook. I know. I'm one of them.

Since I started my adventures in the kitchen some years ago, the ranks of amateur cooks have expanded at an amazing rate. Fully half of my friends today boast that they are good cooks. They can prove it, too. On special occasions when they display their culinary talents, they like nothing better than to share the fruits of their efforts with others. Some of these meals are truly wonderful feasts.

Old-time Methods

Men who make a hobby of cooking do so for a variety of reasons. They may like the way a certain sauce is prepared. They may have a favorite method for barbecuing meats, serving spaghetti, or putting together a fish chowder. Be that as it may, I have a rather strong suspicion that a lot of amateur male chefs are motivated by a deep nostalgia. I know it's that way in my case.

When I first ventured into the family kitchen, I found that I was in a workshop that was wholly mechanized. I was surrounded with gadgets and strange cookery appliances. The Lady of the House, who prepares our three meals a day, uses these tricky gadgets deftly as a matter of routine. But being a mere male, they scared me.

Thus, when I cook, I prefer to use the old-time methods and equipment. They're not nearly as efficient as today's labor-saving devices. They may take two and three times as long to prepare a meal. But for me and many of my friends as well, they represent tried-and-true methods of cooking we have known since we were boys.

The amateur in the kitchen regards his projects as a delightful adventure. He approaches the job with an enthusiasm that would be notably absent if necessity forced him to produce three meals a day, a routine the Lady of the House faces almost every morning of her life. Seldom is the amateur an all-round cook. He wisely decides to be a specialist, devotes his talents to a very few dishes, and likes to think that he does them superlatively. This opinion is frequently shared by his friends and family.

Original Dishes

Most of our dishes are basically simple. We may claim credit for them, but the truth is that we often owe an assist to Fannie Farmer or a credit line to some female ancestor. But, blithely we add a new ingredient, and claim the dish as original. Squatters' rights, pure and simple!

Lurking deep in the mind of many amateurs is a nostalgic longing to produce food equal to that which he ate with so much gusto and relish when he was a youngster. Some of us have been able to produce something that is more than a reasonable facsimile of dishes that tempted us in our youth. And it's often likely that we want to prepare these dishes exactly the way our mothers and grandmothers did.

There's a friend who lives in a big and comfortable house atop Watchung Mountain, in New Jersey. One

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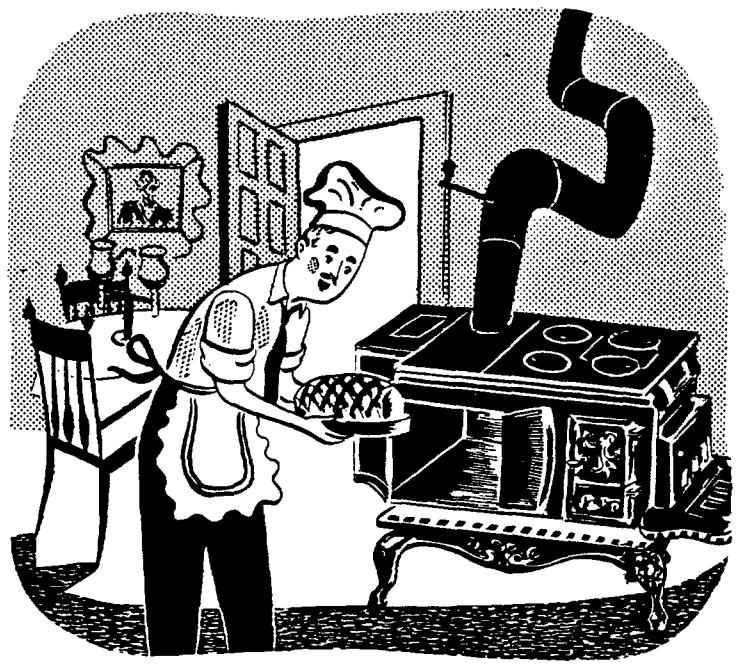


day he came across an old-fashioned kitchen range, a wood-burning affair which he installed in his modern kitchen. The time-honored stove gives the room a real kitchen atmosphere, and on a cold morning, it's a delight to breakfast in the kitchen, with the table close to the friendly warmth of the stove. I envy him the possession of the stove, but I'm grateful for his bounty – a Saturday night supper of baked beans, endowed with a fragrance and flavor that defy description.

Baked Beans

To make them, he soaks two quarts of white Navy beans overnight. In the morning he boils them until the skin of a bean bursts when he blows on it. He drains the beans, after they have cooked on a low fire for a couple of hours. Then he mixes the liquid with one-half cup of molasses, a tablespoon each of dry mustard and salt, and two tablespoons of brown sugar. The crowning touch is a teaspoon of ground ginger.

Next he covers the bottom of an old bean pot with a generous slab of salt pork, rind down. Then he adds three small onions, spiked with cloves, and pours in the beans and the dressing, tops the whole with a large slice of salt pork, lightly scored. The pot is ceremoniously covered and placed in the medium heat of the yawning oven of the wood-burning stove. The beans are baked for five patient hours, more liquid being added as needed. The final hour is done with the cover of the bean pot removed – and the aroma that escapes whets the most sluggish of appetites.

These beans might be just as succulent had they been baked in a gas or electric range, but I have a private suspicion that the wood-burning stove mysteriously imparts a special elegance of taste.

The helpings are generous; each guest is given a treasured piece of the salt pork. Each bite is a delight. Hot brown bread, a cold, tangy cole slaw that your mother might have made, give balance to the meal. A small wedge of warm mince pie, spiked with a little elderly rum and slices of a crumbly dairy cheese, complete the meal. These Saturday night suppers are popular, the table is always filled.

Many male cooks, I find, concentrate what they are pleased to call their culinary genius on a Sunday or holiday breakfast.

King-size Breakfast

Long a neglected meal, something should be done about breakfast. *Break fast* – that's just what it means. It's the start of a new day; the body demands nourishment, tasty food. True culinary genius can make of breakfast one of the most delightful of meals. Time was when it *was* that sort of a meal. Possibly that is why, of a Sunday or holiday morning, many amateur cooks approach the kitchen with joy in their hearts, a light in their eyes, and a settled determination to rustle up a real old-fashioned meal for the family.

Memory probably swings back to farm breakfasts of fried mush and sausages, to corn cakes and fried country-cured ham, to a time when how many helpings you had, was a matter between you and your conscience.

Thank heavens, corn cakes are more than just something to remember – the male cook can brew them today, and they're fully as good as those grandmother made in the farm kitchen of beloved memory. Here's how I do it, and here's what are needed:

- 1 cup white flour
- 2 eggs, lightly beaten
- 1 tablespoon sugar
- 1½ cups cornmeal
- 1½ teaspoons baking powder
- 2 tablespoons vegetable fat

Sift the dry ingredients together, adding a little salt. Then blend in the eggs and melted shortening, followed by enough buttermilk to make the batter the right consistency. If you want to go high-hat, use sour cream instead of buttermilk.

Beat the batter with an egg beater to a silky smoothness, and bake until brown. Glorious is the word for these corn cakes.

I start the breakfast with a tall glass of frosty orange juice. My ham isn't home-cured, but I approximate it by spreading each slice lightly with prepared mustard and a dust of brown sugar. The ham emerges from the broiler tender, juicy and flavorsome. If possible, the table should be graced with a bowl of red raspberry jam. The cook rushes in fresh relays of hot cakes and ham. Everyone enjoys the meal, even the red-faced cook who is foolish enough to think that sound appetites, openly arrived at and satisfied, are a paean of praise.

Remember the suppers of yesteryear?

Dinner at Noon

In the winter, we ate just before dusk and lamp-lighting time. The old kitchen would be faintly dusted with twilight. When the stove door was opened, a cheerful red glow would lighten the room momentarily. There would be a clatter of dishes; fine smells would fill the air. Dinner we ate at noon, and it was the really big meal of the day. Supper was supposed to be "filling," just enough victuals to support the inner man until breakfast.

I remember a memorable dish of cream salt pork gravy, something I have not encountered outside my own home for many a weary and hungry year. It was – and still is – as close to ambrosia as any of us may reasonably expect to taste in this world.

I happen to know how it was compounded. It should not be a secret formula, but one that deserves to be shared with this generation.

I want my salt pork with a modicum of lean in it. I cut it into quarter-inch slices, about three inches long, toss it into a frying pan, cover it with water and place over a low fire. After boiling about three minutes, the meat is removed and placed on paper towels to drain and dry. The meat is then covered and tossed in flour containing a lot of pepper. Save the excess flour and fry the slices over a low fire until they are a transparent brown. Remove and place the slices neatly around the edge of a hot platter.

Keep four tablespoons of the fat in the skillet, heat and slowly stir in the flour until you have a thick smooth mixture. Then add top milk or sour cream slowly, stirring like mad. When the gravy has reached the right consistency, let it boil for three or four minutes. Remove from the stove; stir in a few drops of tabasco sauce. Fill the center of the platter with crusty baking powder biscuits, fresh from the oven. Decant the gravy over the biscuits, hurry the platter to the table and serve generously. With it we like sliced tomatoes in a French dressing that contains more than a trace of garlic.

Stuffed Peppers

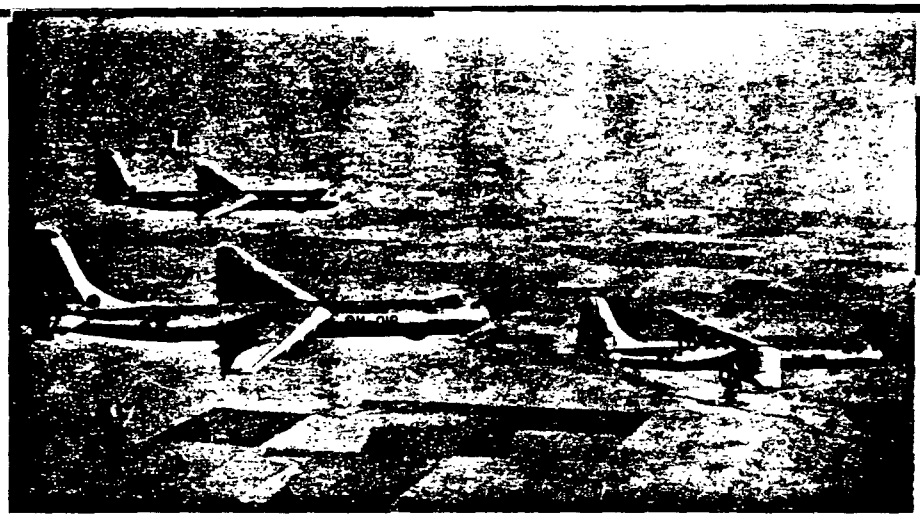
It's still a tremendously fine supper dish. When we had it on the farm, grandmother often served the salt pork gravy with mealy boiled potatoes and stuffed green peppers. These peppers had been stuffed with finely shaved crisp cabbage and they had drowsed for months in a crock of spiced vinegar in the cool cellar. Enormously good – even today! There would be a plate of ginger cookies, some spiced peaches, glasses of cold buttermilk, flicked with the gold of butter. Just enough, as I said, to sustain life until time for breakfast.

Not all the amateur cook prepares can be rated as superlative. We make our mistakes, and quickly and secretly bury them in the garbage container. But we extract a lot of joy from our hobby.

Time was when the sight of a male in the family kitchen excited a lot of ribald comment from other males. Now it is a hobby dear to the hearts of great surgeons, business executives, and professional men, among others. We openly boast of our ability as cooks, and swap recipes with the abandon of the Ladies' Sewing Circle.

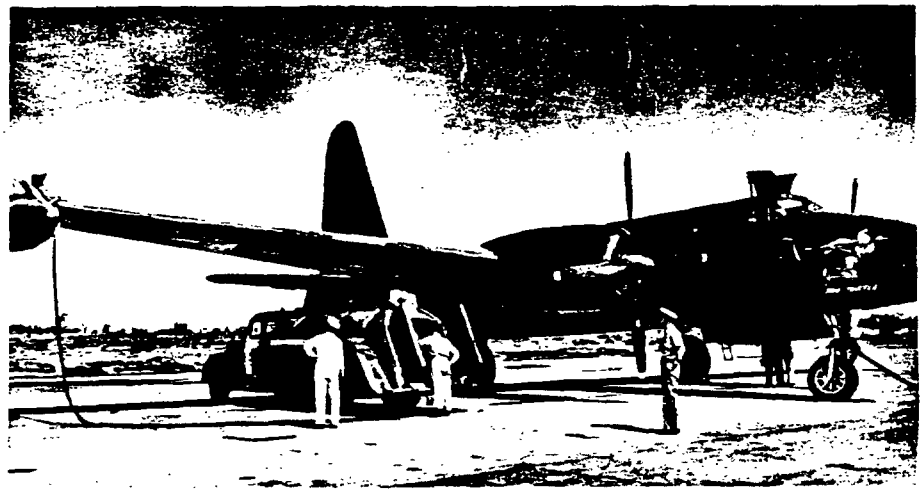
The amateur cook of an inquiring mind, a little courage, and a determination to become a perfectionist in a limited way, will probably succeed. It's a harmless hobby; it can be practiced in all seasons. If the amateur is good, he can give a welcome respite to the Lady of the House, who richly deserves it.

We like the old-fashioned dishes. Memory is a potent influence. Nostalgia nibbles at most of us, compels us to do many things, such as trying to recapture the charm, the inherent goodness of the food of other days. It's an adventure into the remote past that has many rewards.



Written

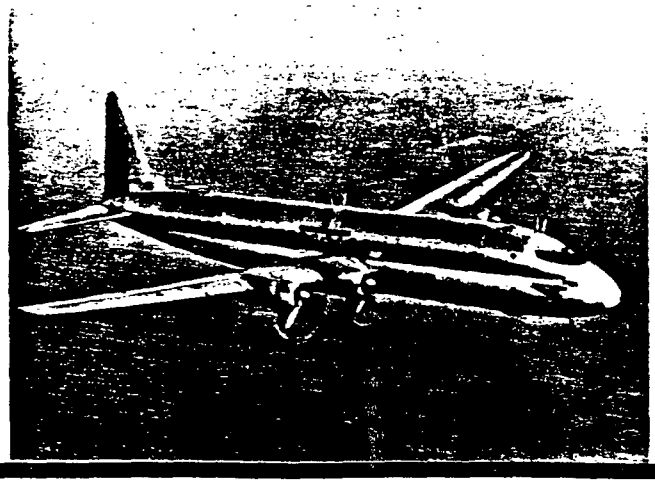
These B-36 bombers are the world's largest. They can deliver a heavier bomb load farther than any other plane. One has carried a record bomb load of 84,000 pounds

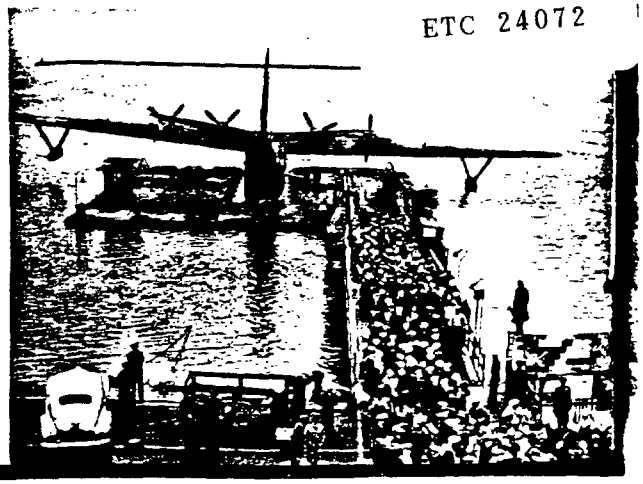


The Navy's P2V1 Neptune, Truculent Turtle, completed a record 11,236-mile non-stop flight from Perth, Australia, to Columbus, Ohio, in 1946. The elapsed time for the flight was 55 hours and five minutes

The longest non-stop flight on record, for a light plane, was recently made by William P. Odom, who flew his Beech Bonanza plane from Honolulu to New Jersey

Below left, the world's largest land based transport in service is the Navy's Constitution. It recently carried 90 persons on a non-stop coast to coast hop. The Navy's seaplane, Caroline Mars (below), took 269 persons aloft to set a record for single aircraft





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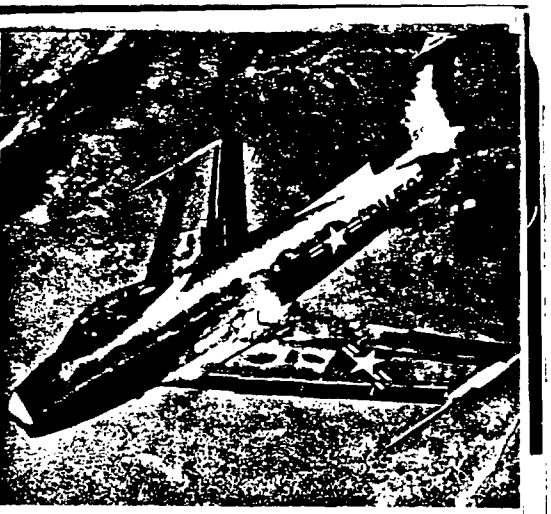
in the Skies

Record after record has fallen in the last few years, as airplanes of all types have gone on to set new marks

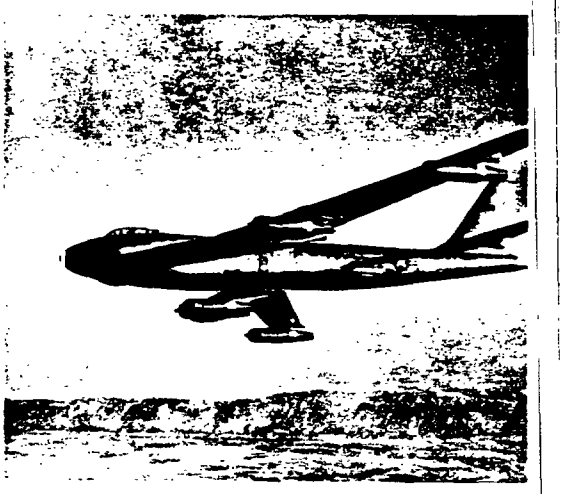
IN THE INTENSIFIED research and development work that has characterized postwar aviation, practically every record known to man has been broken. Within the past several years, successive new marks have been set – not only in speed – but also in such factors as rate of climb, load, altitude, endurance and range. Even the Berlin airlift represents an amazing record, with U. S. planes accounting for nearly four-fifths of the more than a million tons of supplies flown into that city.

New records, which have been established in both the military and civilian fields, cover almost every type of airplane – ranging from the light personal plane to the heaviest bomber in service. In addition, new strides have also been made in helicopters and even in blimps.

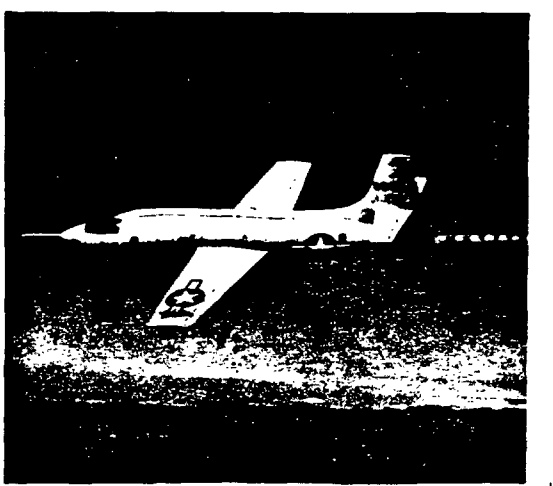
Pictured on these pages are some of the planes, and some of the marks, that have been made by American airmen only since 1946.



A North American F-86A holds the official world's speed record. Last year one of them sped across the U. S. Air Force's proving ground at Muroc Lake, California, at the speed of 670.981 mph

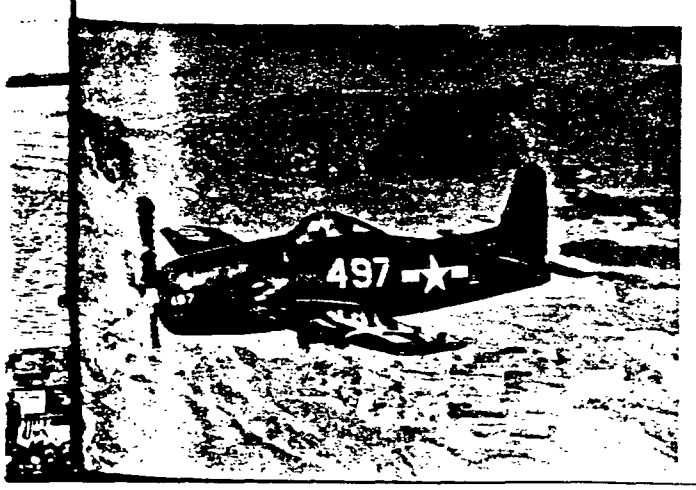


A Boeing XB-47 Stratojet bomber has flown across the country at a ground speed of 607 mph. The new six-engined bomber can deliver 10 tons of bombs anywhere within a 600-mile radius

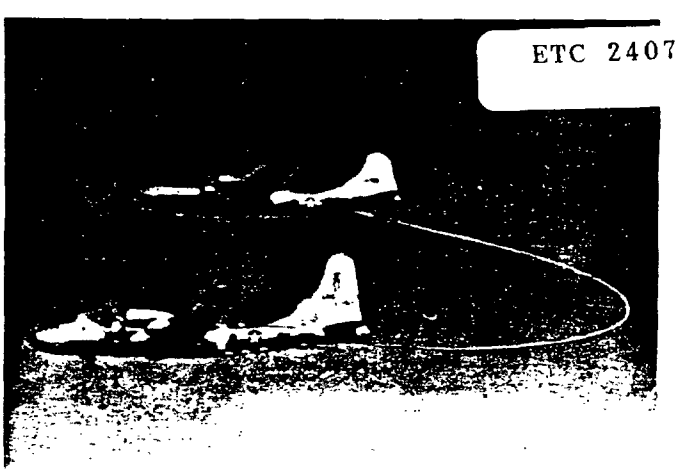


Although Air Force officials have said the Bell X-1 is capable of speeds of around 1,000 mph, they think of it more as a flying laboratory rather than a military craft

Below, the Navy's Grumman F8F fighter holds an official altitude record, rising from a standing start to 10,000 feet in 1 minute and 34 seconds



Below right, a B-50 recently made history by making the first non-stop flight around the world. Here is the way it was refueled in mid-air



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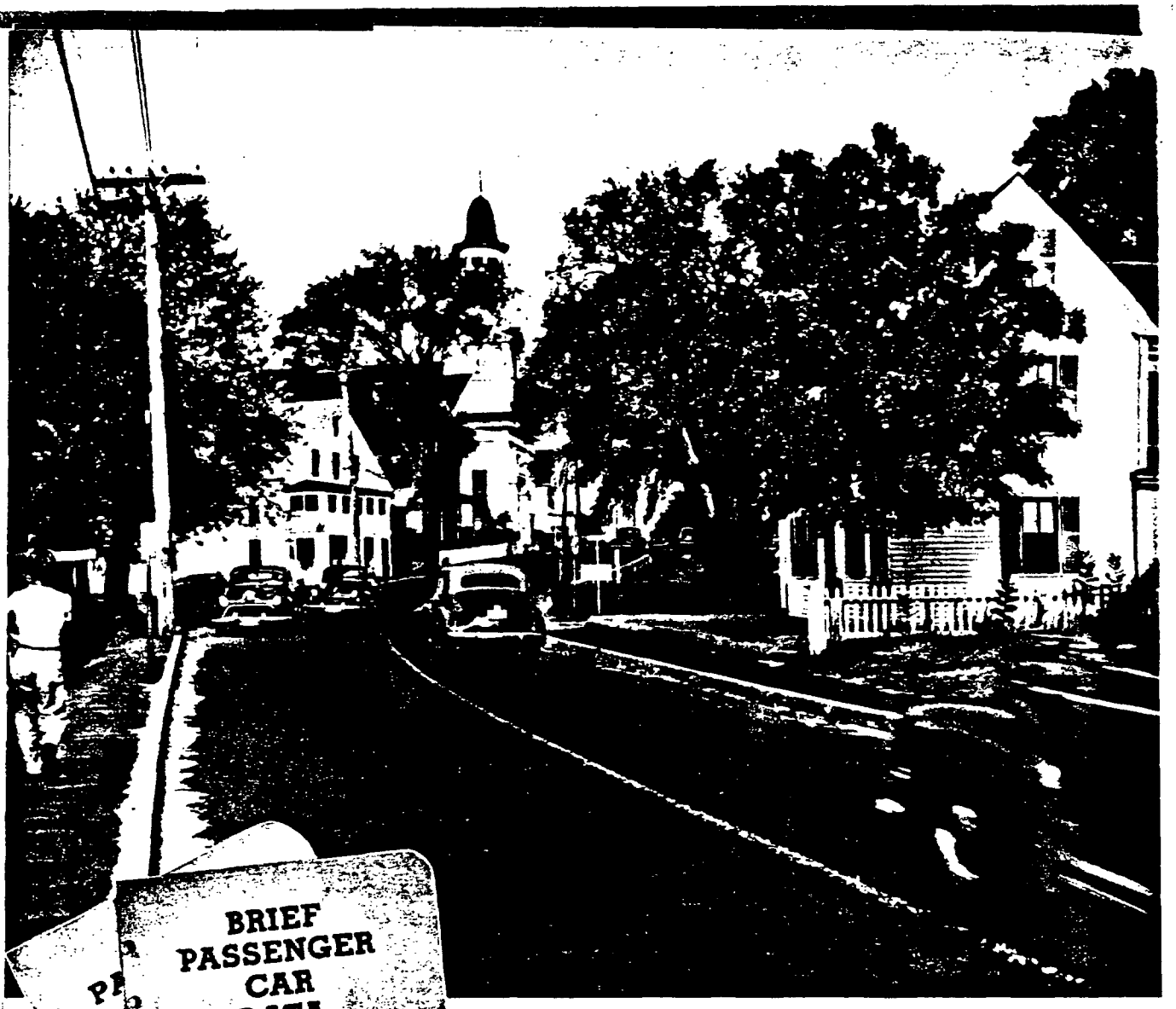


Profile of a Booklet

Brief Passenger Car Data, published by Ethyl Corporation, provides a compact and handy reference for automotive and oil company personnel

OF THE SCORES of educational and general information publications issued by Ethyl Corporation, there is no better "best seller" than the annual Brief Passenger Car Data booklet.

Between the covers of this pocket-size booklet are contained the pertinent engine specifications and general data of every late make and

model automobile. Alphabetically, the material listed for each car runs from "AMA horsepower" to "wheelbase." Enumerated in between are some 40 other vital details, such as "compression ratio," "firing order," "ignition timing," and "valve material." None of the information is confidential, but nowhere else, it is believed, is this material grouped into a single piece of ready-reference literature.

Wide Range of Uses

Brief Passenger Car Data is compiled primarily for the use of automotive and oil company personnel as an added service to the industries which Ethyl Corporation serves. Sales, service, marketing, and research staffs especially find the booklet of value. Engineers in Europe and other foreign lands also report vivid interest in the publication as a means of keeping abreast of automotive engine development in this country. Limited copies are available for distribution to libraries and engineering students and other individuals.

Traditionally, the booklet is issued within a matter of weeks after the last new vehicle of the model year has made its public debut. The 1949 edition, marking the 16th year of publication, will shortly be published. All 20 of the established automobile manufacturers are represented in print. They offer the motoring public a choice of 56 different models, one less than was marketed last year.

From the standpoint of the average motorist, the most significant disclosure of the new edition is that engine compression ratio is continuing its year-after-year advance. In only two of the previous 15 years of normal production since publication of the booklet began has the average standard compression ratio failed to increase. On 1949 models, it is 6.87, compared to 6.73 for last year's vehicles. The highest standard compression ratio of any new model is 7.80, as against last year's 7.50. The lowest is 6.30, the same as 1948.

Brief Passenger Car Data is prepared by the Technical Service Division of the Ethyl Corporation Research Laboratories in Detroit, or, more specifically, by the Passenger Car and Accessory Section of that Division. Technical Service is the liaison group between the Ethyl Laboratories and the manufacturers of gasoline-powered engines.

During the course of a year, members of the Passenger Car Section make more than 100 calls and visits to manufacturers in order to obtain the information and to keep advised of any last-minute changes in engine design or structure. The high degree of accuracy which the booklet has maintained through the years is due in large measure to the fact that sales, service, and engineering personnel of these manufacturing companies cooperate to the utmost in supplying the best available facts and figures. The data printed in the booklet are strictly those furnished by the makers of automobiles, spark plugs, and other engine parts. None represents the results of tests conducted at the Ethyl Laboratories.

When the Brief Passenger Car Data booklet was conceived back in 1931, it was intended solely as a guide for personnel of Ethyl Corporation's sales staff. By keeping company representatives fully advised on the engine specifications and characteristics of current cars, the booklet enabled them to render better and more prompt on-the-spot service in the field.

"Best Seller" Today

At the outset, only 500 copies of each year's booklet were printed. Through the years, however, the popularity of the publication has grown by the thousands and tens of thousands. Some 175,000 copies of the 1949 edition – 350 times more than the original printing –

Ethyl's new passenger car data book serves the motorist by providing service stations with an "answer book" for many questions concerning parts and accessories

Originally a guide for Ethyl personnel, subsequent editions of the booklet have become a valuable tune-up reference

will be produced and distributed.

More than half of these copies will be circulated by many of Ethyl's customer companies, and many of these booklets will carry, above or beside the "Ethyl" trademark on the cover, the trade-mark or name of the individual oil company. At their own request and in keeping with demand, oil companies began sharing in the mass distribution of the booklet two years ago, thus increasing its circulation by almost 100,000.

As the appeal of the booklet has broadened, the publication has reflected its own growth. Originally entitled "Passenger Car Specifications and Adjustments," and later "Passenger Cars, Brief Specifications and Adjustments," it was given its present name in 1937. Also in that year a new format was decided upon, and the publication appeared in a brighter dress. The use of larger type and a different manner of presenting the data made it easier to read. Then, in 1947, the booklet shed its black-and-white face in favor of a colorful new postwar jacket.

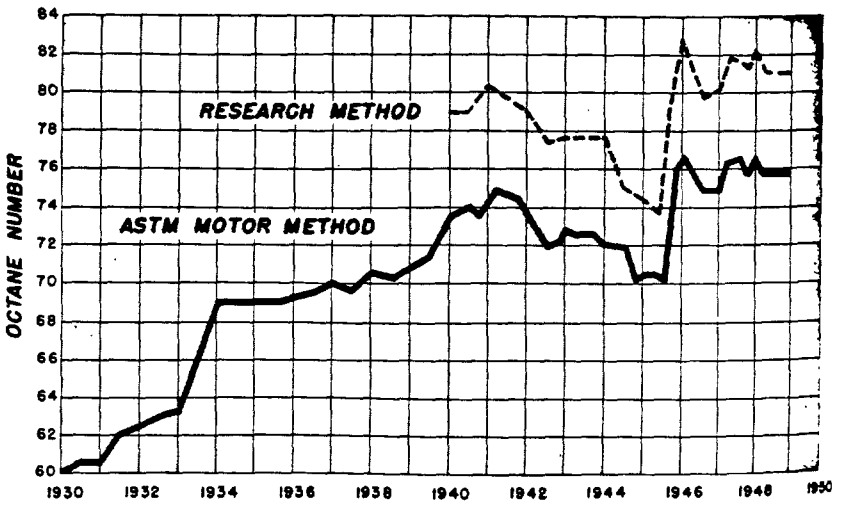
More than an accounting of the salient bits of information about late model automobiles and their power plants, the series of Brief Passenger Car Data booklets is, in truth, one type of history of the modern American automobile industry.

Its pages tell, albeit not in so many words, of the tremendous strides that have been made in rendering engines far lighter than their forebears and yet more powerful and more economical to operate. They demonstrate how the advent of improved gasoline and the continual improvement in motor fuel antiknock quality have enabled engine designers to step up compression ratio year after year. And, finally, they relate the industry's "settling down" from 32 manufacturers offering 70 different models in 1931 to the present field of 20 makers and 56 models.

Old-timers Missing

Missing now are many of the once-great cars that played leading roles in the early scenes of America's pageant of motor transportation. These included the Auburn, Cord, Cunningham, Durant, Duesenberg, Essex, Franklin, Graham, Hupmobile, Jordan, Marmon, Oakland, Peerless, Pierce-Arrow, Reo, and Stutz. All were listed in the very first Brief Passenger Car Data booklet, along with Buick, Cadillac, Chevrolet, Chrysler, DeSoto, Dodge, Ford, Hudson, Lincoln,

TREND IN ANTIKNOCK QUALITY OF REGULAR GASOLINES SOLD IN THE UNITED STATES



Besides detailed automotive specifications, the booklet also contains handy references on trends in premium and regular gasoline quality

Nash, Oldsmobile, Packard, Plymouth, Pontiac, Studebaker, and Willys. The latter, of course, are still in production. Mercury joined the list in 1939. Three new makes – Crosley, Frazer, and Kaiser – have been added since the close of World War II.

Parallel Improvement

In chronicling the steady climb in average compression ratio, the booklet clearly demonstrates how engine development and fuel antiknock quality have gone forward hand-in-hand. The average standard compression ratio in 1931 was 5.23, as against today's 6.87. "Ethyl" gasoline averaged 73 octane number (Motor method) 18 years ago. Now it is an average 80-plus. Regular grade fuel, meanwhile, advanced from 60.4 to 76.1 during the same period.

It is significant that the biggest single jump in average standard compression ratio occurred in the 1935 models. They boasted a 6.06 ratio – the first time that the average compression ratio ever had surpassed the 6 to 1 level and an increase of .34 over the previous year's average. In large measure, this achievement reflected a single-year increase of six octane numbers in the antiknock value of regular grade gasoline, following the introduction of an "Ethyl" antiknock compound for addition to that grade of motor fuel in 1933.

A review of the earliest booklets brings the high compression picture into focus. It was reported in the first edition (1931) that high compression heads could either be had on some makes and models at the time of purchase or that these heads could be installed later (average cost: $30, plus installation charge). On the other hand, "high compression heads are not being produced and are difficult to obtain" for several cars, the booklet noted.

One year later, a marked contrast was evident. Most cars were appearing with higher compression heads. Factories were specifying and recommending to motorists the use of "Ethyl" gasoline, and one manufacturer even cast this advice into the metal of the heads. By 1934, the year following the introduction of leaded regular grade fuel, car after car required gasoline of 68-70 octane number or better. Average standard compression ratio of that year's models was 5.72. Today, due in large part to the availability of superior motor fuel, average standard compression ratio is more than a full ratio higher.

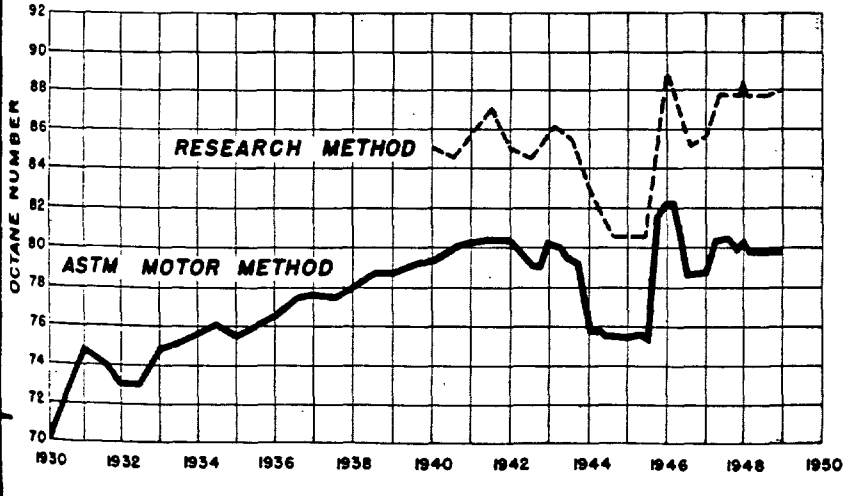
Just as Brief Passenger Car Data is a kind of history of the industry, so, too, is it a condensed encyclopedia of certain information of interest to automotive and petroleum company personnel. In addition to the detailed list of engine specifications for each model, the booklet also features a graphic chart which reveals, at a glance, the life story of the average American automobile engine since 1925. Other charts record the ever-upward trend in antiknock quality of both premium and regular grade gasolines sold in the United States.

Added Facts on File

From time to time, it has also published such miscellaneous information as engineering formulae, spark plug heat range comparison and spark plug specification charts, a curve sheet showing the amount of different types of anti-freeze needed for various atmospheric temperatures, American measures and their metric equivalents, and a curve sheet plotting the distance required to stop a car with brakes in excellent, good, average and poor condition.

The Brief Passenger Car Data booklet may not be, as one enthusiastic recipient described it, a "Baedeker of the automobile engine," but it does serve as additional source material for those charged with maintaining engine-fuel compatibility. Ethyl values the cooperation of automobile and accessory manufacturers in freely supplying information about their products, and that of the various oil companies in placing the booklet in the hands of thousands of interested new readers.

TREND IN ANTIKNOCK QUALITY OF PREMIUM GASOLINES SOLD IN THE UNITED STATES



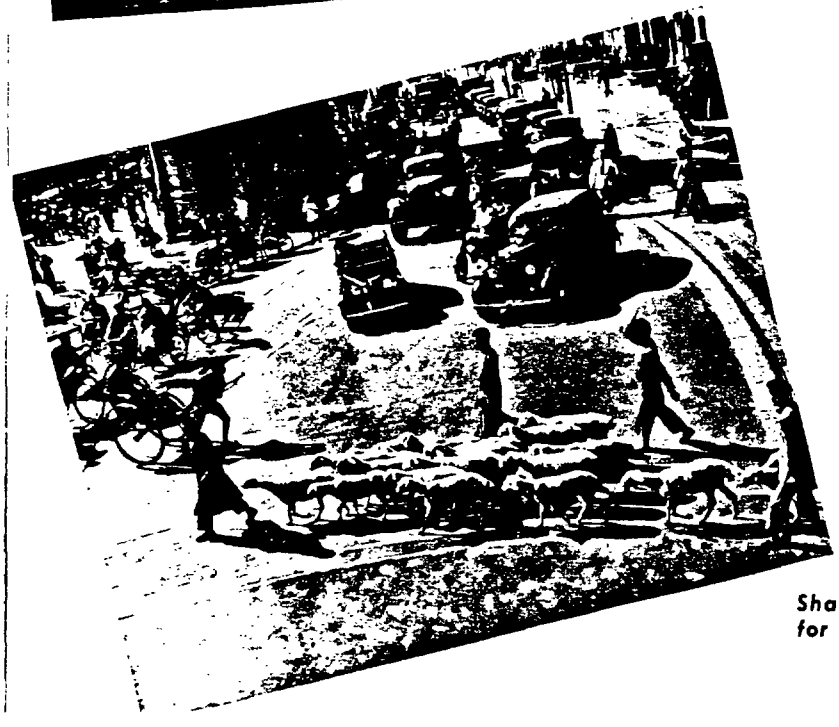
ETC 24077

CHINESE TRAFFIC PUZZLE

By Martin Sheridan

Shanghai's helter-skelter streets and meandering population make an ordinary motor trip a hair-raising adventure

Police stand guard while workers remove graven images bordering a busy street where worshippers caused serious traffic jams



Shanghai drivers must be on the lookout for everything from rickshas to sheep

AMERICAN MOTORISTS may think one city or another in this country is the world's worst when it comes to driving through traffic, but they had better not jump to conclusions too quickly. Any city they could name in the United States has less congestion, greater order, fewer snarls and less confusion than almost any urban center in the Far East.

There isn't much doubt that Shanghai holds some kind of record. The Chinese city, long before the war between Nationalist and Communist forces had any effect upon its bewildering hubbub, refused to recognize anything even faintly suggestive of law and order in its traffic system. Nothing has ever been more noisy, more terrifying or more devastating on the nerves than motoring through the streets of the great metropolis.

Tension and uncertainty have accelerated the kaleidoscopic rush hither and yon, but the city never slept, never paused and never quieted down from its hectic pace before the war either. Although burdened with worries and problems, the great seaport has been trying to carry on just the way people outside of combat areas have always clung to their everyday patterns of living as much as they could, and as long as they could.

Shanghai is a truly cosmopolitan place in every sense of the word. Take several million Chinese speaking 30 different dialects, sprinkle among them 30,000 White Russians, some British, American, Portuguese, Indian and French nationals plus a

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handful of 30 other nationalities, and you have one of the most cosmopolitan groups in the world. Some are accustomed to driving on the left side of the road; others on the right. Place an assortment like this behind the steering wheels of passenger cars, trucks, buses and taxicabs, and you'll understand why it is advisable to remain on the sidewalk, or better still, safely up in a hotel room.

It isn't so much the number of vehicles in Shanghai that makes it perilous to roam the streets. There aren't more than 30,000 cars and trucks in the roaring city. But it's the way the Chinese drive – and the intensity with which they accelerate and maneuver. Always there is keen competition for the right-of-way among the automotive vehicles and the estimated 50,000 rickshas and 30,000 pedicabs roaming the city. But to make matters worse, the people of Shanghai meander through its jammed streets with complete disregard for passing vehicles and their own safety.

Such traffic aids as corner stoplights might as well be there purely for decorative purposes. Nobody pays attention to them for at least 30 seconds after they have changed. Chinese police attempting to control the flow of pedicabs, rickshas and autos also have a futile time. They hold up their hands to halt traffic – but everyone continues calmly to pedal or roll right past them. The writer has seen officers throw up their hands in despair, shrug their shoulders and walk disgustedly from their platform back to the sidewalk.

Believe it or not, it's risky for policemen to try to stop offenders.

The policeman who attempts to lecture or arrest an errant ricksha boy or motorist usually becomes the target of stinging epithets – as well as garbage or debris – and frequently is beaten up by the crowd for his vigilance in administering the law. Gilbert and Sullivan had it right. "A policeman's lot is not a happy one."

Whatever the cause, the Chinese make mighty poor pedestrians. Their reaction to danger is slow and hesitating. They'll get trapped in the middle of a busy roadway and freeze on the spot. Finally they'll jump back and laugh good-naturedly while the car bearing down on them locks brakes and screeches to a halt.

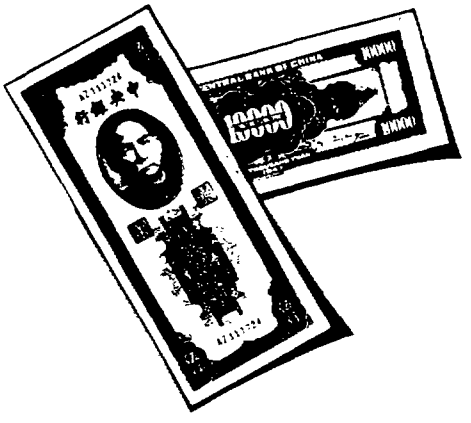
A typical Oriental traffic jam is a cacaphony of blasting auto horns, tinkling ricksha bells, racing motors, screaming voices and sing-song cries of street hawkers. Ask a Chinese driver what he considers the most valuable piece of equipment on his battered automobile. He'll quickly tell you – the horn.

If he sights a vehicle coming toward him, even though it's a quarter-mile away, he'll massage the horn button. And if he sees a pedestrian at the corner, a pretty girl on the sidewalk or a friend in an upstairs window, the horn again goes into action. The Chinese don't mind percolating in a rattletrap minus brakes or headlights; but take away the horn, and they're licked.

They don't believe in slowing down at intersections in Shanghai. Drivers use their horns, instead, and jam on the brakes only as a last resort. Maintenance of their autos is mediocre, at best, and to them "jamming on the brakes" means using the foot brake, squeezing the hand brake – and sometimes dragging one's feet.

I used to consider myself a fearless, rugged individual, having survived the Cocoanut Grove holocaust, two amphibious landings in the Pacific, three bombing missions and a submarine war patrol. But I shudder nervously when I think of the night that Dick Tregaskis, the writer, and I hired a taxicab to take us to a Russian restaurant on the outskirts of Shanghai.

"No hurry," we told the cabbie. "Go slow."



Supplies for Shanghai's factories move on the Soochow Creek where the congestion often rivals that of the city's streets

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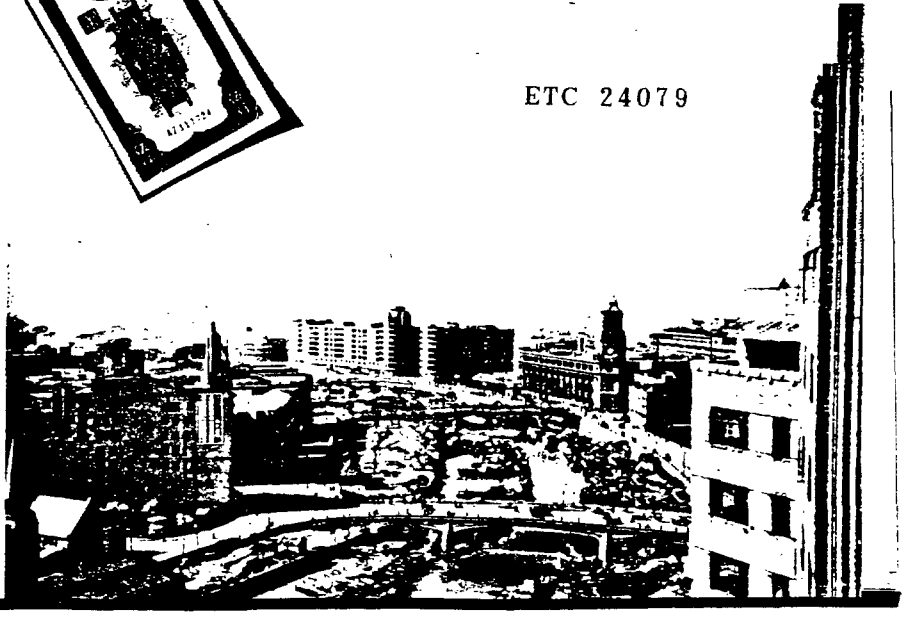


Apparently that was the wrong advice to offer him. The Oriental madman shifted into second with a vengeance and ground into high at 40 miles an hour. With barely room enough for one car with a thick coat of paint, he sped down the cobble-stoned streets in the Chinese quarter, sending natives flying into doorways and flattening them in terror against walls. He and his ancestors must still be disentangling themselves from the many curses which were hurled at them. His was the most blood-curdling demonstration of broken-field driving I have ever seen.

The next morning, the U.S. Navy offered me the use of a jeep for the day. I politely declined, however, deciding not to tempt the fates a second time. But riding around Shanghai in a ricksha or bicycle-powered pedicab is only slightly less perilous. The ricksha boy gets just as tangled up in the stream of the city's traffic. And, more than that, he may abruptly stop and join the crowd of onlookers, whenever something exciting or interesting takes place, leaving his impatient fare to sit and stew in the ricksha.

Taxicab fares are determined by agreement in advance – and having settled on the price, the passenger would think that the end of it. Far from it. It's only when he arrives at his destination that he learns he has only begun to negotiate with the driver. For it is then that a big argument takes place over the size of the tip. Only after long haggling is the affair finally settled.

Gasoline is rigidly rationed in China, and shortages exist everywhere. Early in the morning, Shanghai drivers line up for blocks in trucks and passenger cars to await their turn at the few service stations in operation. Disappointment is often their reward, however, as the pumps usually run dry before everyone has his quota.

To add to the confusion and difficulties of operating in China, there are the vagaries of the Chinese currency. A year ago, one U.S. dollar was worth about $153,000 in Chinese National Currency (CNC) on the black market, although the official rate of exchange was $12,000 (CNC) to $1 American.

When I arrived in China in June, the official rate had jumped to $450,000 (CNC) to $1.00, but 99% of all transactions, I was told, were conducted at the black market rate of $1,100,000 Chinese to $1 American. Rates varied from hour to hour and from street to street, and the wise person never exchanged more greenbacks than he needed for the next few hours. A month after my arrival the value of the American dollar had zoomed to $1,800,000 Chinese.

One day, upon tendering a state-side certified check for exchange at the Shanghai branch of an American bank, an official told me I was crazy to do business there. "You can get three times as much on the street corner," he said.

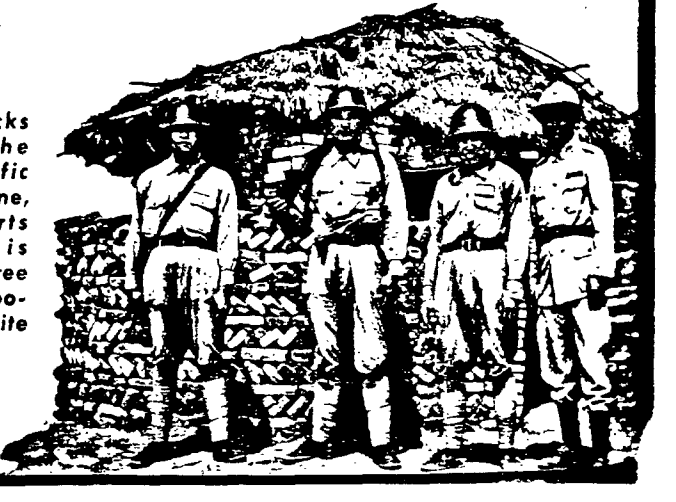
An attempt to explain the machinations of Chinese currency would be next to impossible. Suffice to say they are mysterious.

Going out for dinner at night always presented the problem of how to carry enough money to pay the restaurant check. Certainly no ordinary billfold could hold the $18,000,000 to $25,000,000 in Chinese currency usually required. Consequently diner-outers carried small canvas bags packed with colorful bills.

The currency problem, of course, is only one of the many ills plaguing the war-torn nation. Business is uncertain at best in Shanghai, and nobody knows what the next day will bring.

But through it all, the men and women of Shanghai keep on shuttling back and forth through their labyrinthian streets, alleys and waterways at the same furious pace. They've been doing it for so long that by this time it's practically a reflex action. It's just Shanghai.

OUR COVER: Color photograph of Bryce Canyon, Utah, by David W. Corson through A. Devaney, Inc. **OUR PICTURES:** Page 3, courtesy Standard Oil Company (N.J.); Pages 4, 5, courtesy National Highway Users Conference; Pages 6, 16, Philip Gendreau; Pages 7 and 10 (bottom), courtesy Public Roads Administration; Page 8, courtesy Socony-Vacuum Oil Company; Page 9 top right, courtesy Johnson Motor Company, (top left) courtesy Winner Manufacturing Company; Pages 11-13, cartoons by The Strimbans; Page 14 (top, 3d from top, bottom right), Wide World, (second from top and bottom left) U.S. Navy; Page 15 (top to bottom on right side of page), U.S. Air Force, (bottom left) U.S. Navy; Pages 17, 18, Camera Associates; Pages 20, 21, Press Association; Page 22, courtesy Martin Sheridan.



Even roadblocks are part of the Shanghai traffic puzzle. This one, on the outskirts of the city, is manned by three soldiers and a policeman in white

ETHYL PLANT WINS SAFETY AWARD

For completing more than a million man-hours of work without a time-losing injury, and for the accomplishments of its over-all safety program during 1948, the Ethyl manufacturing plant in Baton Rouge, La., last month received the highest honor of the National Safety Council — the Distinguished Service to Safety Award.

The award and pennant were presented by Arthur J. Naquin of the New Orleans Public Service Commission, an executive committeeman of the National Safety Council, shown on the right in the photo above. The pennant was accepted for Ethyl and its employees by Reginald W. Woest, Sr., left, a maintenance foreman who represented the management group. Harry Zachary, an employee in tetraethyl lead maintenance and representing wage roll personnel, accepted the certificate of award. Zachary has one of the outstanding plant safety records.

John H. Schaefer, vice president and general manager of manufacturing; C. W. Bond, resident manager, and other company officials and union representatives participated in the program. Hundreds of employees attended the ceremonies, which were held at the plant.

The plant's record of 1,016,983 man-hours without a time-losing injury was reached on November 7, 1948, and marked a high point in safety achievements last year. The ethyl chloride area personnel set a record last summer of 466 days worked without a time-losing injury. The number of major injuries throughout all areas was reduced by 33% and accident frequency dropped 40%.

The 1948 results were in keeping with progressive trends in Ethyl plant safety records. Since December, 1945, the number of company workers in Baton Rouge has increased by 77%, but accident frequency has been cut down by 57%. Continuous efforts are being directed towards still further improvement of safety performance.

Standards set last year followed an intensified accident prevention program carried out under the direction of Carroll Hebert, supervisor of safety and plant protection and a staff of safety engineers working in cooperation with employee safety groups. The educational methods used included moving pictures, talks by safety specialists, advertising campaigns, and a plant-wide safety contest.

The Distinguished Service to Safety Award is the third safety honor that the Ethyl manufacturing department has received during the past six months. In November, the plant won third place in the National Safety Council's chemical section, group III, and shortly afterwards it received the American Petroleum Institute's accident prevention award for the record of one million safe man-hours worked.

Both are setters—but the "Trade-marks" of Nature distinguish each breed. The **GORDON SETTER** (*top*) always has a black coat with tan markings. The **ENGLISH SETTER** (*foreground*) is white, usually with blue, orange or lemon markings.

When you see these dogs

THE "TRADE-MARKS" OF NATURE*

distinguish the breeds

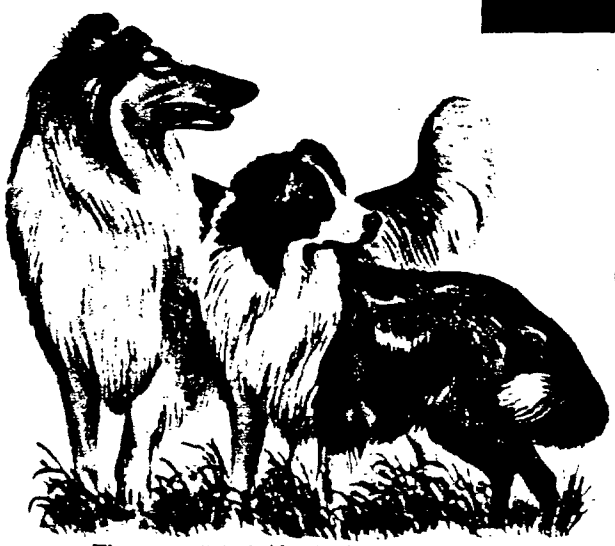
Prepared in cooperation with Arthur Frederick Jones, Editor, American Kennel Gazette.

The short, crooked forelegs, heavier set body and the loose folds of skin on the neck, head and face of the **BASSET HOUND** (*left*) distinguish it from the **BEAGLE** (*right*).

When you buy gasoline

THE TRADE-MARK "ETHYL"

identifies gasoline stepped up with "Ethyl" antiknock fluid



The **COLLIE** (*left*) is identified by a long, tapering profile with almost no break at the brow. The **BORDER COLLIE** is smaller, his head is shorter and broader, and the forehead is more pronounced.

TO UNLEASH YOUR CAR'S POWER

to enjoy the eager performance of a car running at its best . . .

to get the full measure of smooth, even power that your engine was designed to give . . .

ask for "Ethyl" gasoline — high quality gasoline improved with "Ethyl" antiknock fluid, the famous ingredient that steps up power and performance.

"Ethyl" antiknock fluid is made by **ETHYL CORPORATION,** *Chrysler Building, New York 17, N. Y.*

ETC 24082

ETHYL NEWS

MAY • 1949

ETC 24083

IN THE

ETHYL NEWS

MAY 1949

Dr. Robert A. Kehoe, who has been medical director of Ethyl Corporation since 1925, has been presented with the William S. Knudsen award for 1948-1949 "for the most outstanding contribution to industrial medicine." The award, which was bestowed by the American Association of Industrial Physicians and Surgeons, was in recognition of Dr. Kehoe's work in industrial toxicology and in the educational field of industrial medicine.

Dr. Kehoe has been responsible, in no small measure, for the safety controls which permit the successful manufacture and use of "Ethyl" antiknock compound in gasoline. His original research into the toxic aspects of tetraethyl lead, together with his recommendations for controlling these hazards, have been followed as basic policies by Ethyl Corporation.

In addition, Dr. Kehoe has been prominently identified with the educational field of industrial medicine. He has directed the Kettering Laboratory of Applied Physiology and the Institute of Industrial Health, since their founding in the University of Cincinnati. In addition, he has served the cause of industrial health in such organizations as the American Public Health Association, the American Industrial Hygiene Association, and the American Academy of Occupational Medicine.

Dr. Kehoe is professor of Industrial Medicine and head of the Department of Preventive Medicine and Industrial Health of the College of Medicine of the University of Cincinnati.

THE PLUS IN PREMIUM GASOLINE 3

About half of all the cars on the road require premium gasoline for knock-free performance. This estimate — based upon recent investigations into the fuel requirements of the car population and studies of the various factors that determine these requirements — emphasizes the importance of premium gasoline today.

ARTERIES FOR FUEL 9

Great Lakes Pipe Line Company has grown from a single line running from Oklahoma to Chicago into the largest products pipe line system in the country. This story tells how the company serves a major consuming area.

CAUSE FOR ACTION 12

Contrary to popular notions, the job of lobbying entails more hard work than glamour. Successful lobbyists realize that most Congressmen take the business of law-making seriously and want facts and figures instead of entertainment.

ROOM TO PARK 14

There are many ways in which the downtown parking problem is being solved. One of the most important solutions is in the ramp type of garage. This multi-storied structure is gaining in popularity because it can house many cars in a small area.

MEMENTO MANIA 18

The American tourist has a weakness for souvenirs. To accommodate him — and his unpredictable tastes — an unusual industry produces everything from painted turtles to 100-pound statuary.

In order to widen the fields of reader interest in Ethyl News, we frequently publish articles contributed by writers not associated with Ethyl Corporation. Opinions expressed in signed articles are the authors'. The editors of the News welcome articles of timely interest submitted from outside sources.

Published by ETHYL CORPORATION, 405 Lexington Avenue, New York 17, N. Y.

Manufacturer of "Ethyl" antiknock compound, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, secretary

ETC 24084

the PLUS in Premium Gasoline

By Julian J. Frey, General Sales Manager, Ethyl Corporation

EDITOR'S NOTE: *The accompanying paper was presented before a meeting of the American Petroleum Institute Marketing Division in St. Louis, Missouri, on May 10th. Portions of it are reprinted as a matter of interest to our readers.*

THE ADVENT of a premium grade of gasoline is usually associated with the introduction of "Ethyl" gasoline in 1923. Actually, there already were a number of premium fuels on the market when "Ethyl" gasoline first made its bow. Some of these premium fuels had been introduced as far back as 1915, if not earlier. They included such brands as Betholene, Amoco, Refiners Aero, Staroline, Waco Pep, White Rose, and Jenney Aero, and they sold for anywhere from three cents to seven cents a gallon premium over the regular gasolines of the day.

Now it should be remembered that, when these fuels were being marketed, there was nothing like our present knowledge of fuel-and-engine relationships. There was no octane scale to serve as a yardstick of fuel quality. We knew comparatively little about the efficient utilization of fuels in engines. Yet, surprising as it may seem, there were sound practical advantages in those premium gasolines, and motorists gladly paid the added price to obtain them.

Along the eastern seaboard, where the country is hilly, the regular grade fuels then available were literally unable to develop the power needed by many cars. Experience showed gasoline marketers that they could overcome this power loss by blending in some benzol. Accordingly, a representative premium fuel marketed in that area consisted of as much as 50% benzol.

In the Great Lakes area, however, it wasn't hill climbing ability that motorists needed as much as faster starting during the long, cold winter months. Accordingly, premium fuels here were more volatile.

There is a moral, I believe, in this brief account of these early premium fuels. These specific requirements in gasoline quality were important in those regions, and premium gasoline therefore filled an essential need. Because it did, premium gasoline in these sections often accounted for as much as 60% of all gasoline sales by individual marketers.

The advent of "Ethyl" gasoline in 1923 did not, then, introduce the idea of premium fuels. It did, however, broaden the understanding of the reasons for its effectiveness, it led to the marketing of premium fuel of uniform antiknock quality throughout the country, and it opened up a great era of automotive progress.

Beginning with the late 1920's, many of the outstanding engine de-

velopments in automotive transportation were made possible by the availability of "Ethyl" gasoline on a nationwide scale.

The first of these was the famous Chrysler "Red-Head" – the first truly high compression engine of its day. Others were the high compression Buick and the Cadillac, Terraplane, Dodge and Packard engines, which came along during the 1930's. These engines were all designed to use "Ethyl" gasoline, and in certain instances they were so tagged.

Provided a Cushion

At the same time, premium gasoline has provided a cushion both for the motoring public and for the automotive designers.

A new car model may be designed to operate on regular grade gasoline. Yet, because of a variation in octane requirement – which will be discussed in more detail later on – many cars of the identical make and model will require premium gasoline. Two factors enter into this. The first is that manufacturing tolerances in automobile production frequently result in small variations among cars coming off the same assembly line. The second factor is the type of service a given vehicle may encounter during its life.

Many car manufacturers have customarily designed their new models for operation on regular gasoline, knowing that premium gasoline is available to satisfy those units with a higher octane requirement. Accordingly, without premium gasoline, standard compression ratios would have to be lower; as a result, all car owners would be penalized in economy and performance.

The antiknock quality of the "Ethyl" gasoline sold before the war was definitely its outstandingly superior feature. It did, however, have certain other advantages. First, it was more volatile, thus assuring better starting and faster warm-up. Secondly, refiners paid particular attention to reducing the gum content in their top grade of gasoline. As a result, premium gasoline as represented by "Ethyl" gasoline came to be synonymous not only with superior antiknock quality but also with high volatility and freedom from impurities. To a large extent, this reputation of premium fuel for quality in all respects has been carefully guarded by refiners ever since.

As everyone knows, there has been a gradual improvement in the quality of both premium and regular gasoline through the years. This has coincided with continuing gains in automotive efficiency. No one property of fuels has been more important than antiknock quality in making these gains in automotive engine performance possible. As the compression ratios of automobile engines have increased, premium fuels of correspondingly higher antiknock value have made it possible for cars to convert more and more of the inherent energy of gasoline into useful power.

We are all familiar with the Motor and Research methods of rating the antiknock quality of fuels, which have been in use by the petroleum and automotive industries since the 1930's. They are performed in a single-cylinder laboratory knock-testing engine under carefully prescribed operating conditions. In general, the conditions of test for the Research method are milder than those of the Motor method of test. Thus, fuels which are sensitive to engine operating conditions, such as cracked gasolines of all kinds, tend to have appreciably higher octane numbers by the Research method than by the Motor method.

This property of sensitivity in fuels has proved very useful in predicting their performance in cars o the road. Fuels of high Research oc tane number tend to give better per formance in the critical low spee range in modern automobiles. As result, many refiners and marketer have begun to stress this property Sensitivity is defined as the Research octane number of a fuel minus the Motor method octane number. Sometimes this difference in octane rating by the two methods is called "jump"; or the actual degree of "jump" may be specified by calling the fuel a "6-jump," or an "8-jump," or whatever the case may be, thus denoting the number of octane units by which the Research rating exceeds the Motor rating.

As Figs. 1 and 2 indicate, there has been a broad upward trend in the antiknock quality of both grades of motor fuels, although gasoline, like everything else, has been subject to the fortunes of war and peace. Even now, the oil industry has only recently emerged from a succession of shortages that arose out of the unprecedented postwar demand for petroleum products. That is one of the principal reasons why the Motor method rating of premium gasoline was, until recently, slightly below its 1941 level.

Greater Sensitivity

However, it should be noted that the sensitivity of premium fuel as well as of regular gasoline has increased since the war; that is to say, the Research method octane numbers of motor fuels are higher than they were in 1941. A further point of importance is that the sensitivity of present premium gasolines is better than that of regular fuel. Thus, although the Motor method differential between the two grades seems rather small (4 octane numbers), the difference in Research rating between the two grades is larger (7

octane numbers). It is also worth noting that these octane numbers are substantially larger in size, so far as their actual value in an engine is concerned. Illustrative of this higher scale of values, the two octane number difference between octane numbers of 88 and 90 is equivalent to the five octane number difference between octane numbers of 70 and 75.

It is generally believed by technical people that Research ratings more closely correlate with the performance of fuels in passenger cars. Commercial engines operating most of the time at or near full throttle and at high speed are, in general, much more severe in their rating of fuel than passenger car engines. Hence, in considering two types of fuel of the same Research number, the fuel with the higher Motor method number is better for all-around use.

In volatility, too, premium gasolines have consistently outdistanced regular grade fuels over the last 15 to 20 years, as the curves in Figs. 3 and 4 demonstrate. These advantages of lower 10, 50 and 90 percent points have been realized by the motorist in faster warm-up and smoother operation—characteristics which he has come to expect of a premium grade of fuel.

Table 1

Octane Number Requirement in Terms of Primary Reference Fuels

PERCENT OF CARS SATISFIED	SOCONY-VACUUM SURVEY	SHELL SURVEY	ETHYL SURVEY	AVERAGE
40	74	77	76	76
50	76	79	78	78
60	78	81	80	80
70	80	83	82	82
80	82	86	85	84
85	83	87	86	85
90	85	89	88	87
95	88	92	90	90
99	90	96	93	93

In considering the value of the premium gasolines available today, the important criteria are what they do for cars and how many cars benefit from their use.

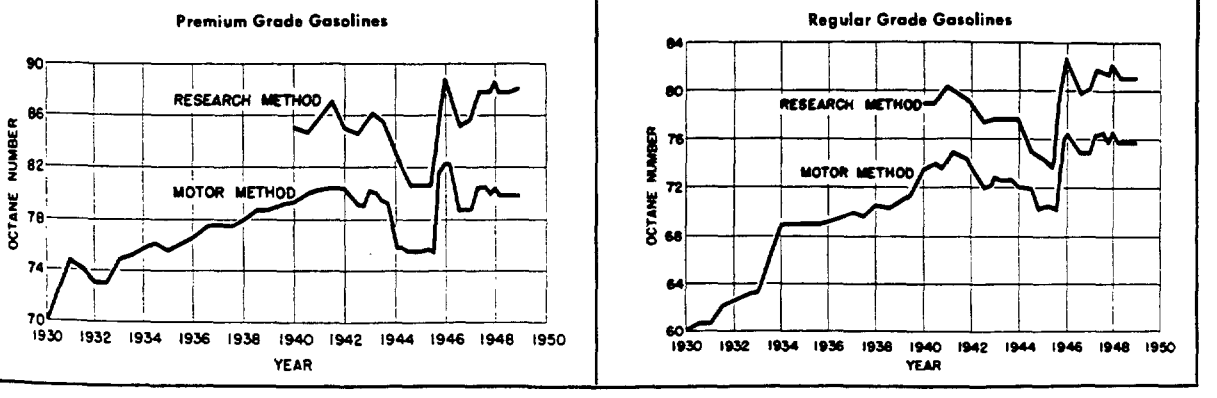
We all know, in general, the importance of premium gasoline to cars. The compression ratios of present-day automobile engines are such that gains in power can be realized in most cases, provided engines are adjusted to take advantage of premium gasoline. With premium gasoline, the motorist experiences these gains in faster starts, quicker pick-up, more power on hills, and more miles per gallon.

But it is not generally realized that a great number of cars on the road actually require premium gasoline for best performance. This is borne out by a number of important surveys, made since the war, of the octane number requirements of the present car population. Three of these surveys, which were conducted by Socony-Vacuum Oil Co. (1), Shell Oil Co. (2), and the Ethyl Corporation, respectively, are summarized in Table 1.

These figures indicate the percentage of the cars tested which were free of knock on the corresponding reference fuel blend. It is necessary to translate these data on reference fuels into performance on commercial gasolines in order to relate the antiknock quality of present-day premium gasoline to present-day engine requirements.

A simple generalization, sufficiently accurate for the present purpose,

Figs. 1 and 2. TRENDS IN ANTIKNOCK QUALITY



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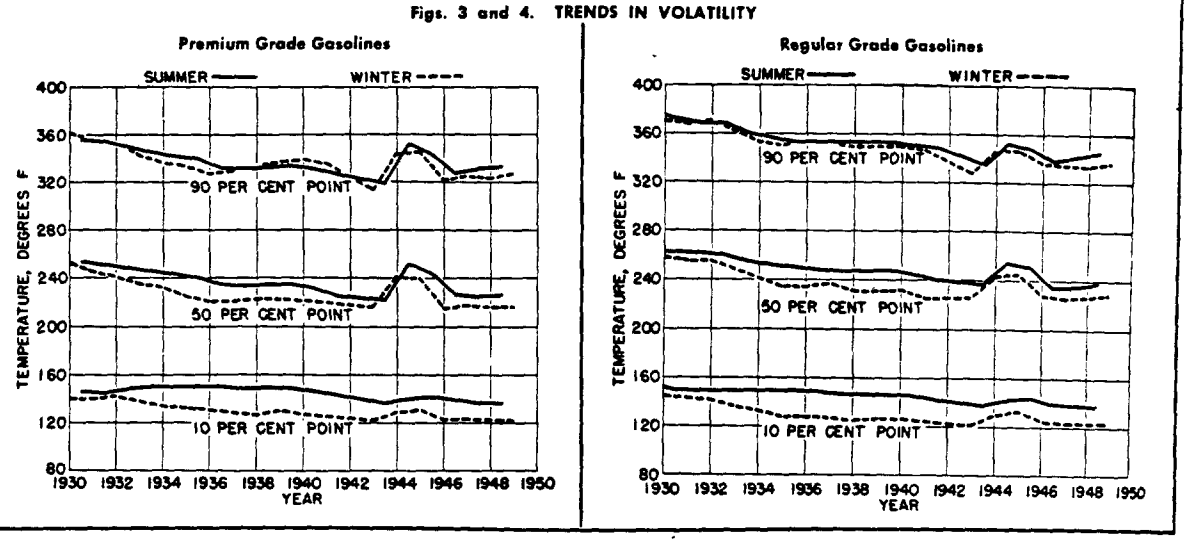
Figs. 3 and 4. TRENDS IN VOLATILITY



is that when fuels are rated by their antiknock performance in cars on the road, the result is somewhere between their Motor and Research octane numbers. The road rating of fuels in cars of newer design is usually closer to their Research value than their road rating in older cars.

It has been concluded by the respective authors of the foregoing surveys, based on a wide experience in the investigation of antiknock requirements, that these data indicate that 30% to 45% of the present car population requires a premium gasoline to be free from knock.

Of even greater interest, I believe, is the more recent work undertaken under the auspices of the Coordinating Research Council. The results of this work have not yet been published, but I have been given permission to refer to them.

On the basis of their latest survey of car requirements, these data show that to satisfy the octane requirements of 90% of the cars in operation a fuel with a road rating of 88 is needed; to satisfy the requirements of 70% of the cars calls for a fuel with a road rating of 84; to satisfy 50% of the cars requires a fuel with a road rating of 81; and to satisfy 30% of the cars a fuel with a road rating of 77.5 is required.

These requirements are in general higher than those previously reported by Ethyl and other laboratories. Moreover, they are believed to be more representative of actual values since special care was taken during the tests not to disturb deposits and other prevailing engine conditions. One of the companies participating in the survey concludes that on the basis of these figures only 30% to 50% of the cars on the road will be free from knock on the current regular grades of motor fuel.

All of these surveys, then, demonstrate that the number of cars which can benefit from premium gasoline is much larger than had been popularly supposed.

Why does such a large percentage of the car population require high octane gasoline? There are several basic factors:

1. A growing proportion of new models is being designed by the car manufacturers to operate on premium fuels.

2. Individual cars of any given make and model, even when brand new, may show considerable variation in their octane requirement, so that while the average car of some given type may be satisfied with regular gasoline, many individual cars of the identical type will require premium fuel for knock-free operation.

3. In actual service, there are a number of variables which affect a car's octane number requirements. This is illustrated in Fig. 5. Furthermore, with use, vehicles accumulate engine deposits which increase their octane requirements. Here again the magnitude of the effect varies over a wide range. Depending on the type of vehicle, driving conditions, the fuel and oil used, and so on, the effect of the deposits may raise the requirement anywhere from 0 to 28 octane numbers. On the average, the increase in requirement with use is of the order of 8 to 10 octane numbers and is independent of the tetraethyl lead concentration of the fuel.(3) This is shown in Fig. 6.

Turning away from technical considerations for a moment, it is interesting to inquire why so many motorists are constant users of premium gasoline. The millions of car owners who buy premium gasoline,

day in and day out, do so because of the assurance of quality they receive. Gasoline quality is as important to them as the quality of everything they buy. They can buy a cheaper and equally nutritious piece of meat, a cheap pair of shoes, an inexpensive suit – all of these things serve their basic function. Yet, people want quality in gasoline, as in everything else, because of the personal satisfaction they derive from its use.

This preference for quality has been repeatedly borne out in surveys of motorists' buying habits. When asked why they buy "Ethyl" gasoline, the majority of motorists cite such quality factors as more power, better performance, prevention of knock, protection for the motor, and improved mileage. The motorist may not always have an exact technical reason for buying premium gasoline, but he knows that it gives him satisfaction.

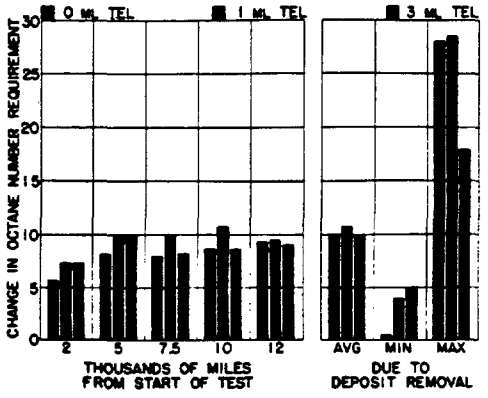
Furthermore, motorists are willing to pay the small difference in price for the extra value of premium gasoline. It is sometimes argued that the two cents a gallon extra the motorist pays increases his fuel bill by as much as 10%. This is not a valid comparison, because the motorist's fuel bill, it has been estimated, accounts for only about one-fifth of the total cost of operating an automobile. On this basis, it costs the motorist only 2% more to operate a car on premium gasoline.

But let's consider the cost in terms of actual outlay. A study of gasoline consumption, made by Ethyl Corporation, showed the annual average consumption per passenger car to be 598 gallons for the central region, 588 gallons for the eastern region, 849 gallons for the southern region, and 653 gallons for the western region, with a United States average of 640 gallons.

Assuming that motorists pay two cents additional for premium gasoline, the average U. S. motorist pays the grand sum of $1.07 a month for the pleasure of using premium gasoline. What does he get for that $1.07 a month – or $12.80 a year?

Well, for one thing, he gets some increase in mileage. How much of an increase will depend on the fuel requirements of his car and the type of driving.

Fig. 6. EFFECT OF FUEL TEL CONTENT AND TEST MILEAGE ON CHANGE IN OCTANE NUMBER REQUIREMENT



Furthermore, his car probably will start easier and warm up faster in cold weather. This may save a towing charge or put off the purchase of a new battery.

Then, too, he has a better running engine which will produce more power and is protected against knock.

Finally, the premium gasoline user gets satisfaction out of it. His $2,500 automobile may be exactly the same as his neighbor's – but with premium gasoline, it runs better, has a faster pickup, produces more power, and even represents a safety factor when he's passing another car on the highway.

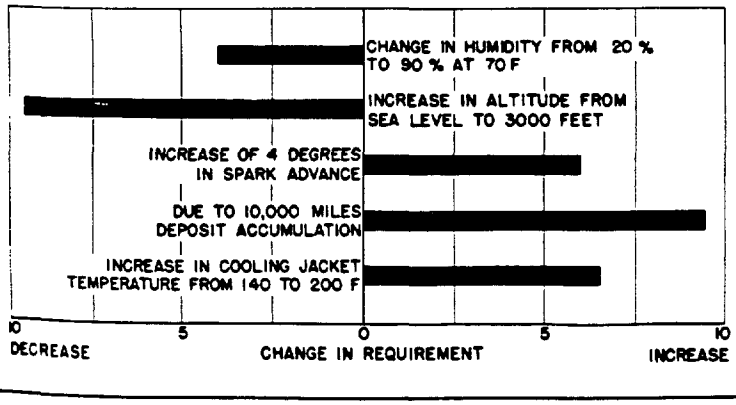
Looking to the future, several questions suggest themselves:

1. What is the over-all role of premium gasoline in future automotive transportation?
2. What areas of gasoline quality must be stressed in order to maintain the position of premium gasoline as a superior standard?

The first question already is being answered by current developments in automotive engineering.

Since the war, the car manufacturers have been engaged in a broad program of engine development that

Fig. 5. AVERAGE EFFECT OF VARIABLES ON OCTANE NUMBER REQUIREMENT



will bring far-reaching benefits to the public. We appear to be entering upon a new cycle of engine improvement at least as significant as that which characterized the transition from the cars of the twenties to the cars of the thirties.

To satisfy those new engines will entail the production of a great quantity of gasoline of substantially higher antiknock value than now produced. We all know that going up in antiknock value costs money – lots of it. Unquestionably, the required investment to produce higher octane gasolines for the motoring public will have to be weighed against the value to be received from their use in automobile engines. Yet we also know that, provided these fuels can be marketed at a reasonable price, the oil and automotive industries as well as the motoring public will benefit.

The higher antiknock fuels permit the construction of engines of higher compression ratio and improved thermal efficiency. These advances in engine design can be used to improve the fuel economy of the vehicles by as much as 15% to 25%, without impairing the high performance Americans have come to expect in their automobiles.

Cadillac and Oldsmobile already have incorporated the basic designs of these new engines in their 1949 models. The new Cadillac engine, for example, which is 200 pounds lighter than its predecessor, produces 10 more horsepower and will propel the car three miles farther on each gallon of gasoline.

The manufacturers state that these new production engines require fuels with a Research octane number of 88. Actually, they were designed for higher octane fuels, but were de-rated to accommodate them to the antiknock level of the premium fuels sufficiently available now. Thus, a continuing demand for gasoline of high antiknock quality may be foreseen. Whenever better gasolines are generally marketed, these engines are so designed that with little basic alteration they can give still greater gains in power and economy. Other car manufacturers are developing new lightweight high compression engines.

For the future needs of the car population, premium gasoline should have sufficient antiknock value to guarantee knock-free operation. It should provide volatility which is adequate for quick starting and smooth performance, and it should have a high degree of purity.

As to volatility, adequate quality depends upon where the fuel is going to be used. However, boiling points are important in more ways than for starting in cold weather. For example, recent work by the Gulf Research & Development Co. has demonstrated the importance of the lower 50% point in gasoline.(4)

Finally, as has been indicated, premium gasoline should offer the motorist the best assurance of always getting clean-burning fuel. It is admittedly difficult to track down all of the factors involved in engine cleanliness and, therefore, it isn't practical to establish any standard at this time. Nevertheless, it seems likely that refiners will take particular care to eliminate from their premium gasolines, to the greatest possible degree, the known trouble makers which may be present.

In conclusion, I should like to summarize these points which, I feel, constitute The Plus in Premium Gasoline:

1. Premium gasoline gives more power to the nation's automobiles and promotes peak engine efficiency – at only a small cost to the motorist.

2. In actual road operation, premium gasoline gives better antiknock performance not only at high speeds but also at low speeds.

3. Approximately half of all cars on the road require premium gasoline for knock-free performance.

4. Premium gasoline provides a cushion for cars designed only for regular gasoline. Without premium gasoline, spark settings would have to be retarded or compression ratios lowered, resulting in a loss of power and greater consumption of fuel.

5. Premium gasoline has made possible many of the outstanding advances in automotive engine design which characterized the prewar era.

6. Premium gasoline will play an essential role in the future, contributing to further broad gains in automotive efficiency and to the conservation of our oil resources.

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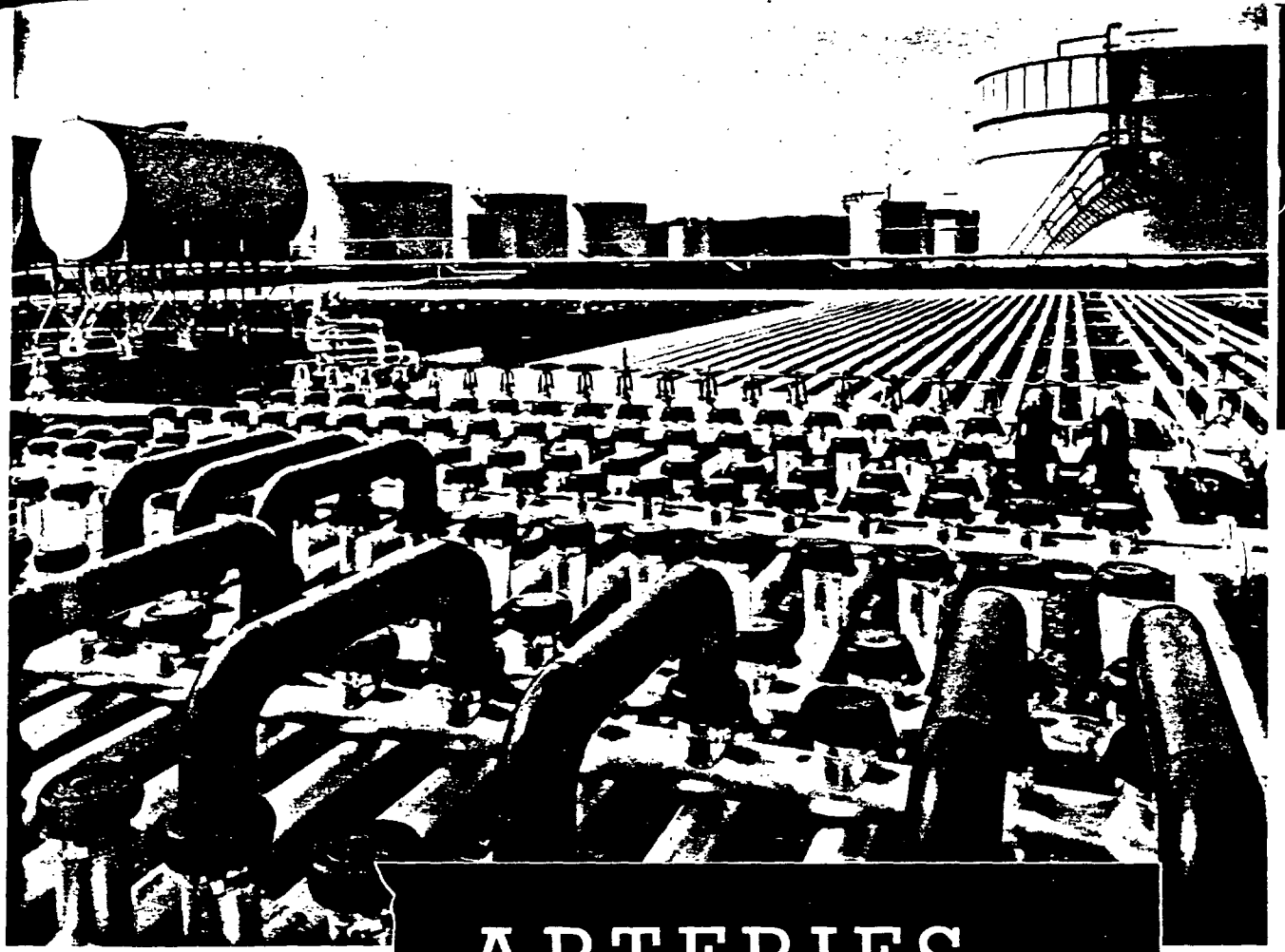
1. "*The Efficient Production and Utilization of Motor Gasoline,*" *by W. M. Holaday, director, Socony-Vacuum Laboratories. Presented before the SAE Annual Meeting, January 12-16, 1948.*
2. "*A New Road Octane Number,*" *by F. R. Watson, F. H. Caudel, and J. D. Heldman, Shell Oil Co. Presented before the SAE National Fuels and Lubricants Meeting, November 4-5, 1948.*
3. "*Factors Affecting Octane Number Requirement,*" *by Harold J. Gibson, Ethyl Corporation. Presented before the SAE Annual Meeting, January 10-14, 1949.*
4. "*A New Approach to the Evaluation of Fuel Volatility and Associated Engine Variables,*" *by J. E. Taylor, assistant chief automotive engineer, Gulf Research & Development Co., and Harold J. Gibson, Ethyl Corporation. Presented before the SAE Summer Meeting, June 6-11, 1948.*



ARTERIES FOR FUEL

Typical of the modern pipe line networks serving the nation is the Great Lakes Pipe Line system in the Mid-West

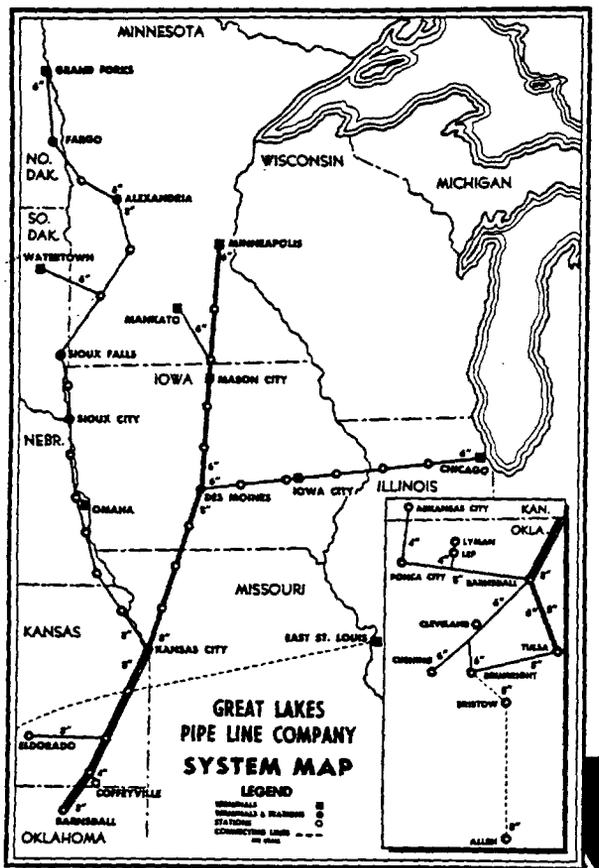
By Christopher C. Vogel

PROVIDENCE PUT OIL and people in the wrong places. If the population of the country were distributed according to the location of our oil supplies, more than four out of every five people would be living in Texas, California, Louisiana, Oklahoma and Kansas. On the other hand, 22 of our 48 states would be as barren as the North Pole.

But oil being where it is, and people being contrary, it remained for the oil industry to set things right. If Mahomet, in this case, wouldn't go to the mountain, then the mountain would be brought to Mahomet. So every day the oil industry delivers a mountain of oil to the American public — by tanker and barge, by tank car and tank truck, and by a vast network of pipe lines.

Of all the modern facilities used in the transportation of oil, none is more varied and interesting than the pipe line. People generally came to appreciate the importance of pipe lines during the war, when emergency lines here and abroad represented veritable life-lines of supply. But what they don't always realize is the essential role pipe lines play in peacetime.

For a glimpse of how a modern pipe line network operates, come along on a trip through the Great Lakes Pipe Line Co. system. The Great Lakes system is the largest refined products carrier in the country — both in mileage and in volume of products handled. Last year the company transported more than 38 million barrels of refined products along its 3,136-mile system. Gasoline accounted for about 88% of all shipments, fuel oil the remainder.



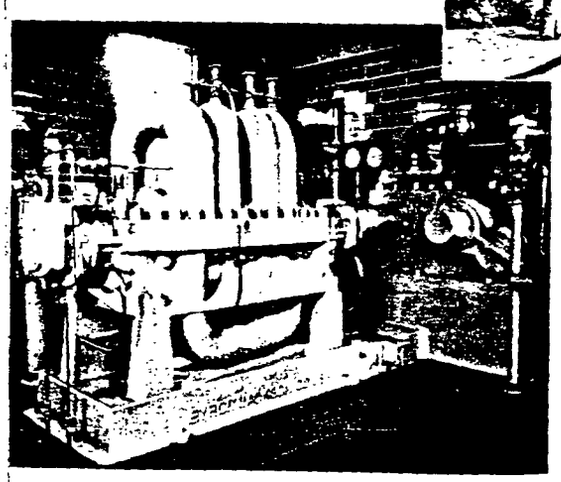
Left, a map of the Great Lakes system shows the extent of the area it serves. More than 80% of its shipments originate below Kansas City

Drawing upon refineries in Oklahoma, Kansas and Texas, Great Lakes Pipe Line Co. distributes gasoline and distillate throughout 11 midwestern states – including Iowa, Wisconsin, Minnesota and North Dakota; most of South Dakota and Nebraska; and part of Kansas, Missouri, Illinois, Indiana and Michigan.

To serve the people who live and work in this important consuming area, Great Lakes distribution terminals range as far east as Chicago, as far west as Watertown, South Dakota, and as far north as Grand Forks, North Dakota, which is within 65 miles of the Canadian border. At these and intermediate points in the Great Lakes system, tank trucks and railroad tank cars pick up shipments and take them to their ultimate destination.

By providing the Mid-West with an important transportation artery, Great Lakes Pipe Line Company also serves a major refining area. All told the system serves 15 refineries in Oklahoma and Kansas. Within the 15,825 square mile area is a network of 1,042 miles of lines which constitutes the major part of the receiving system. In addition, the system is connected to the lines of two other companies in Oklahoma, two in Kansas, and one in Nebraska. One of the Kansas connections is with the line of the Phillips Petroleum Company products pipe line department, from Borger, Texas. Through the line

Right, an overhead section of pipe crossing a river bed. Most of the pipes in the system, of course, are underground . . . Below left, this six-stage centrifugal pump is typical of many in the system



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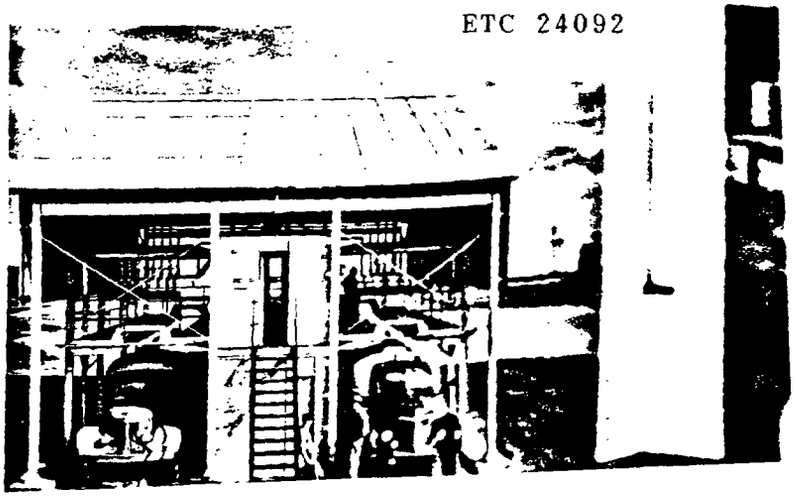

Right, this picture shows the new truck-loading facilities which load two units simultaneously

products are received for distribution from Great Lakes terminals. In turn, products of Great Lakes shippers may be sent over the Phillips line to its terminal at East St. Louis.

Great Lakes, like many other pipe line systems, is a common carrier. It neither produces, refines or markets oil or refined products; nor does it own any oil wells, refineries, or any transport facilities other than its network of lines and terminals. Its sole function is to transport refined products from one section of the country to another.

As consignments of gasoline and fuel oil are accepted for delivery, and put through its lines, the products move along three 8-inch pipe lines running from Barnsdall, Oklahoma to Kansas City, Missouri. At Kansas City, the system divides into two major sections. One, the Northwest leg, extends to Grand Forks, North Dakota, and consists of an 8-inch line from Kansas City to Alexandria, Minnesota, and a 6-inch line from Alexandria to Grand Forks. The second leg of the system runs from Kansas City to Des Moines, Iowa, where it divides, with one 6-inch line branching off to Chicago and two 6-inch lines running north to Minneapolis.

But the Great Lakes system is made up of more than simply sections of pipe running mile after mile. It also consists of 14 terminals, where products are distributed; of numerous pumping stations spaced 25 to 50 miles apart; of huge engines and pumps that move the products through the lines under pressure; and of intricate mazes of valves and controls and tanks and piping. Most of all, it consists of trained people with a specialized knowledge of dispatching petroleum products with maximum efficiency.

The average person might suppose that a shipment of say, gasoline could be loaded on a pipe line at a moment's notice. Actually, that shipment must be planned as much as six weeks ahead. The reason is that the operations of a pipe line system must be carefully balanced. At the originating point, the company must make sure that time is available for the shipment to move through the lines. On the other hand, the volume of products the system can handle at any one time is conditioned by the available tankage at its various terminals. Great Lakes has a rated capacity of 109,600 barrels of products a day.

As a first step, a refinery notifies Great Lakes of the consignment to be shipped. The shipment, which must consist of 25,000 barrels at a minimum, must meet specifications established by the pipe line company. A field staff of four chemists regularly inspects all shipments in advance of their acceptance.

Harry Moreland, president of the Great Lakes Pipe Line Co.

Once a shipment is accepted for delivery, it becomes Great Lakes' responsibility to transport it to whatever one of its 14 terminals it is assigned to. A battery of three powerful six-stage centrifugal pumps, powered by heavy-duty Diesel engines, mounts the shipments at Barnsdall at a pressure of around 900 pounds per square inch, and sends them along the three 8-inch pipe lines running to Kansas City. Intermediate pumping stations along the way repressure the line and provide a smooth, steady flow of the products.

(Continued on page 21)

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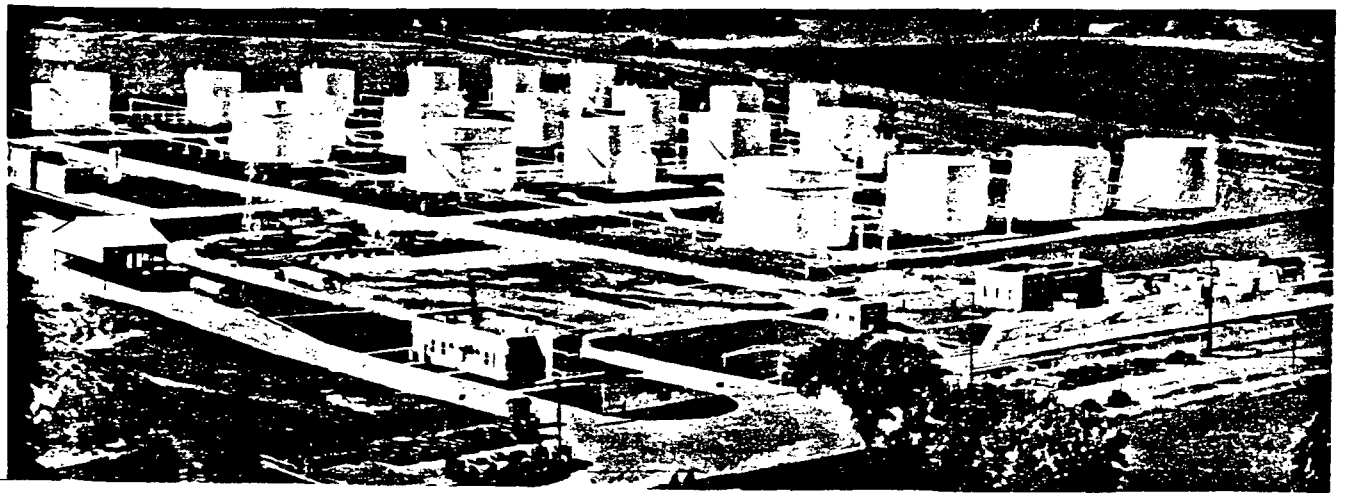
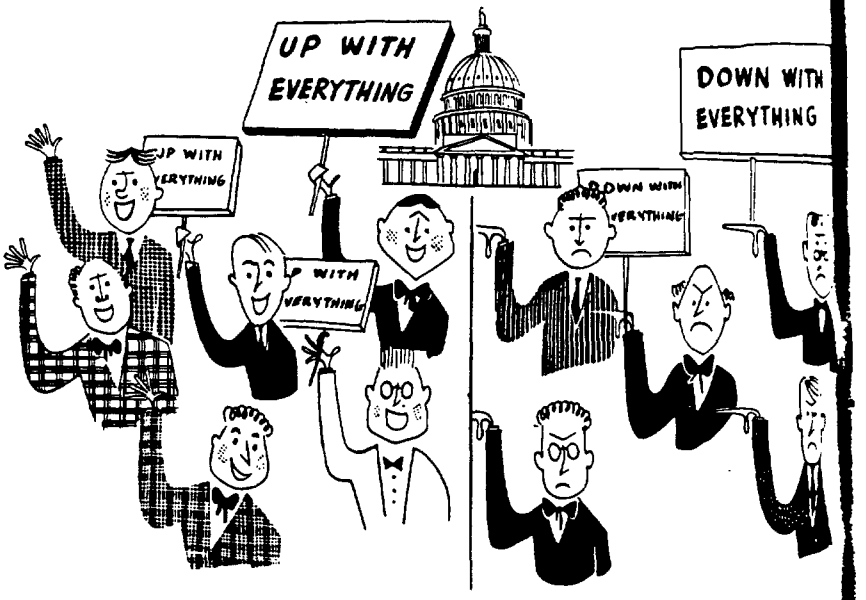
An airview of the distribution terminal at Sioux City, Iowa, showing its tankage and loading and service facilities. The terminal is one of the newest in the system



Cause for Action

Well publicized in recent years, but often misunderstood, are the activities of Washington's lobbyists

By Shirley H. Scheibla



TAKE THE affability of a politician, the education of a college professor, the experience of a top industrialist, the public appeal of a movie star, and the stamina of a work horse – and you have the basic requirements for a top-flight Washington Lobbyist.

Despite these exacting specifications, few people will admit to being lobbyists. No two people, as a matter of fact, seem to agree on what constitutes lobbying. It is, perhaps, one of the least understood of the professions.

The Lobby Act, Public Law 601, broadly defines lobbying as any attempt to influence federal legislation. It requires the registration of anyone who makes such an attempt.

To date, more than a thousand people have registered under the law, which was enacted in 1946. Most of them, however, have done so under protest, insisting that they are not lobbyists at all. Nevertheless, they have "signed up" under the act to avoid prosecution.

One reason for their reluctance to be known as professional lobbyists, perhaps, is the fact that the word somehow has a semi-sinister meaning in the minds of the public. Yet, the fact of the matter is that lobbying serves a valid purpose, enabling groups and organizations to present their causes before Congress and enabling Congressmen, in turn, to become acquainted with the need for legislation.

It is hard to tell at what point the profession acquired its dubious reputation, because lobbying has been conducted ever since man started writing laws. The existence of lobbying all these years, however, seems to be proof of its acceptance as an integral part of law-making.

Many Congressmen will admit privately that lobbyists often are most helpful in bringing to their attention matters which require legislation. Lobbyists, the legislators confide, also are an excellent source for facts on business, agriculture, labor and other subjects.

At a moment's notice they usually can outline how various groups stand on particular issues. The information acquired in this way isn't all one-sided either, because for every lobby in favor of something there's another one opposing it.

Contrary to much popular opin-

The business of lobbying involves hard digging for facts

ion, the job of lobbying entails more hard work than glamour. The successful lobbyists don't use yachts, pretty girls or lavish cocktail parties to further their causes. They realize that most Congressmen take the business of law-making too seriously to be influenced by such goings-on.

The techniques of lobbying vary according to the complexity of modern civilization and the statutes governing it. This means that lobbying today is no simple job. A good lobbyist must be an educated person thoroughly familiar with the problems of the group he represents. He also needs the patience and personality to work with the folk on Capitol Hill until he puts across his points.

The Direct Approach

One lobbyist, who speaks with the authority of an ex-Congressman, says the most effective way to influence legislation is to use the direct and simple device of talking to Congressmen. He emphasizes that they want facts, not propaganda, and are not interested in people who peddle the latter.

Some lobbyists, however, prefer to map general strategy and send their staffs to work on specific matters in Congress.

One successful lobbyist contends that lobbying approaches should be varied according to the type of Congressman. He lists these three general types of legislators:

1. The kind who deals with facts and takes a position accordingly. A little research, and your work with him is finished.

2. The one who won't do anything until he knows how his constituents stand on the matter. This gives lobbyists the chore of stirring up grass roots interest in their cause. They have a tough time when there isn't much public interest in their project.

3. One who refuses to take an interest in anything outside of the work of his committee. He is the most difficult type. This is where the requirements for the affability of a politician, the appeal of a movie star and the stamina of a work horse come in.

Interestingly enough, the best paid men are not always the lobbyists who spend most of their time at the Capitol. They are, instead, men with important positions who deal with legislative matters as only one part of their activities. Such officials, it is thought, can speak with more authority and command more respect and attention from the law makers.

Even the folk who spend most of their time at lobbying report it is not an expensive procedure. They usually list only such expenses as cab fare to the Capitol, phone calls and costs of sending circular letters. There's no mention of such things as banquets and gifts to Congressmen.

Not all lobbying jobs are highly lucrative.

Many of the persons registered as lobbyists said they have other sources of income and that they lobby for nothing because they are interested in their cause.

The lobbies in Washington give a good indication of the political strength of the various segments of voters. Organized labor, for instance, now has the greatest number of registered lobbyists in its history — 75 to be exact.

Lobbies also can point to what matters are likely to receive major attention during a session of Congress. Lobbyists are hired on a large scale only when their supporters think there is a reasonably good chance that their causes will be considered in the legislative chambers.

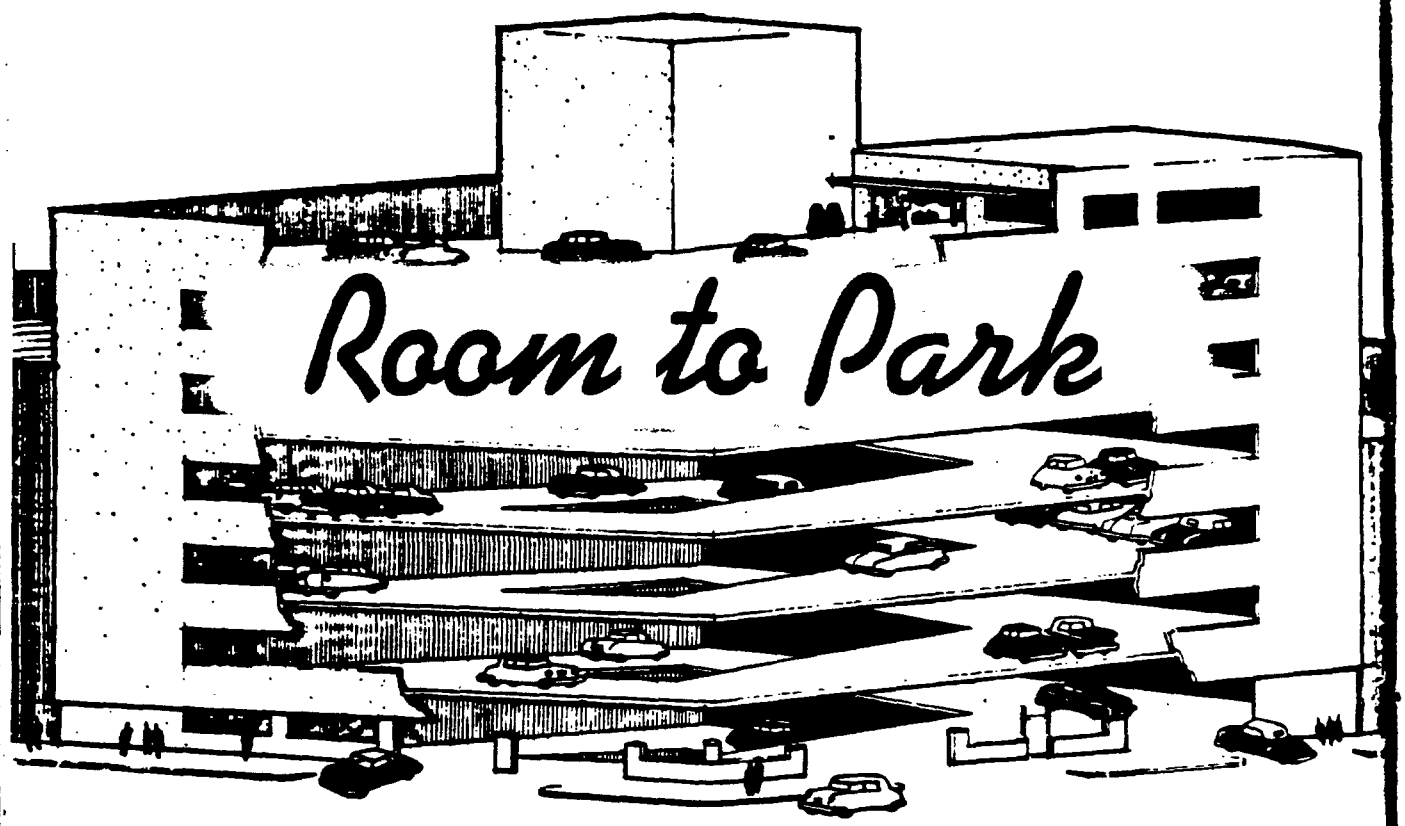
Much unpleasantness can result when opposing lobbies start attacking each other by name. Old-timers call this hitting below the belt. They say it's wiser to put up a good clean fight and not get involved in mudslinging with your competition.

With all the complications involved, it is perhaps amazing that so many people are willing to lobby. One reason, perhaps, is that whatever the cause, there is always someone willing to champion it.

ETC 24095

Lobbyists must be walking encyclopedias on many subjects

Room to Park

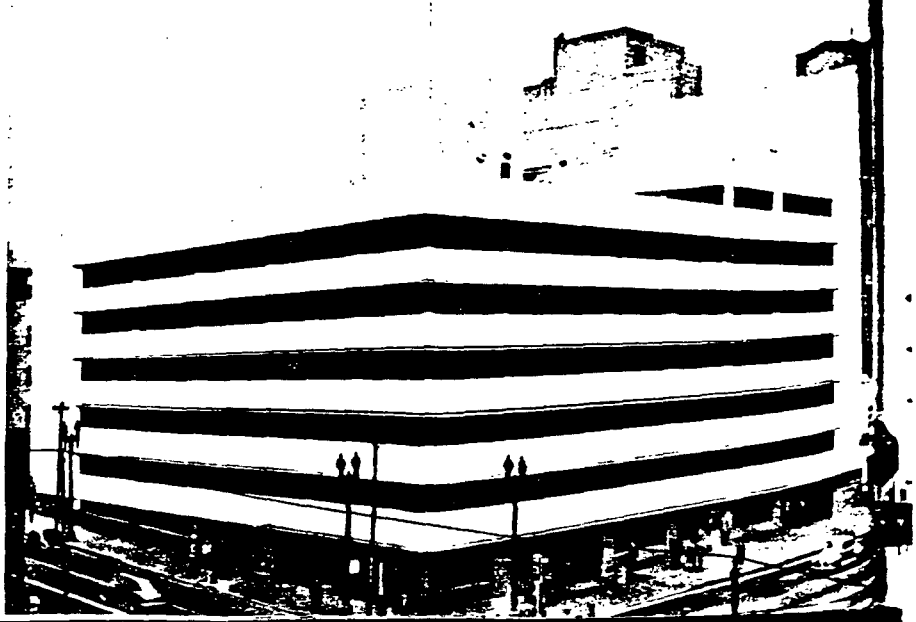


The need for parking space among the nation's cities is bringing forth many proposed solutions. One which is finding favor is the multi-storied ramp type garage

LESS THAN ten years ago any motorist looking for a place to park his car around Union Square in San Francisco had a problem on his hands. There just wasn't enough room to take care of all the cars that daily congregated at the heart of the city.

This problem, however, did not escape the notice of San Francisco's traffic officials and it was of direct concern to the merchants around Union Square. Both parties decided that something had to be done, and quickly.

A group of civic leaders met with city officials and things began to happen. Architects and technicians were called in to analyze the situation. They decided it was feasible to build a parking station under Union Square Park. Definite action took place in 1941 when ground was broken for a four-floor, underground structure costing $1,550,000. The citizens group formed the Union Square Garage Corporation and obtained a 50-year lease for subsurface rights in the park. The private corporation got a first mortgage loan for $850,000 and sold cumula-



Right, General Petroleum's new garage in Los Angeles features a 60-foot wide continuous ramp from basement to roof. . . Above, a cutaway sketch of the new structure shows the roof service station and a center core equipped with elevator and stairs

ETC 24096

tive preferred stock in the area for the balance.

The 1,700 car garage has made money ever since it was opened in 1945.

Union Square's success has not gone unnoticed by other cities. Probably more than anything else it has stimulated civic groups and city fathers to get together in cities where traffic veins and arteries are beginning to clot in downtown areas. And since the war the search for room to park has been more intense than ever before and many plans are being considered, but the multi-storied garage stands out as one of the most popular solutions for a congested downtown area.

Joint Efforts

Store owners, landlords, theater men, bankers, and many others know it is in the public interest for them to cooperate to finance huge garages. City officials, in turn, agree that the automobile has become such an integral part of American life that providing room to park is a necessity for any city's survival. They, too, are cooperating by making suitable sites available through condemnation. Zoning and traffic regulations are adjusted when necessary, and sometimes the cities even provide temporary tax relief.

One of the most important figures connected with the planning and development of multi-storied garages is Fred W. Moe, president of Ramp Buildings Corporation. His name is familiar to city planning groups and chamber of commerce committees across the country, because, since the early 1920's he has helped plan and develop hundreds of large parking facilities.

Moe believes that almost invariably private groups must arrange for financing if the problem is to be licked. Most city budgets, he observes, are too overburdened with other matters to take on garage building too.

The decision concerning what kind of facility is most desirable usually can be based on city or state traffic surveys already available. In big cities where land is costly, it is often cheaper to build the entire structure underground, as was done with the Union Square structure. Each decision depends upon individual conditions.

The site, however, must be in the middle of the congested area if it is to offer traffic relief, Moe observes. "People just won't walk more than a block or two from their cars. We've found that large parking buildings on the fringe of business centers won't pay, even if the land does cost less."

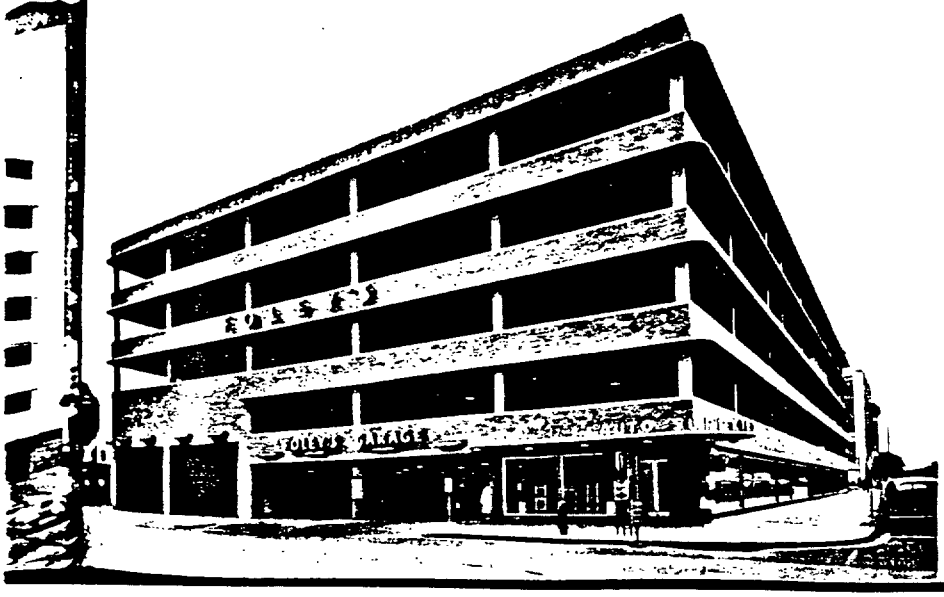
Almost every large city in the country is working on some sort of a plan that calls for high capacity garages. New York, Chicago, Boston, Houston, Los Angeles, and Newark all have projects under consideration. In Newark a group of 12 leaders in merchandising, banking, utilities and insurance fields is analyzing sites to determine the type of parking building to erect.

Four Stories Underground

In Los Angeles, the downtown parking association is following a program similar to that of San Francisco's Union Square project. The Los Angeles group is negotiating a lease from the city for a 2,400 car four-story underground garage to be built under Pershing Square Park.

Not all activity, however, is in the planning stage. Some important projects have been completed since the war. Most of these are privately financed and they point up the fact that room to park will be an important consideration from now on.

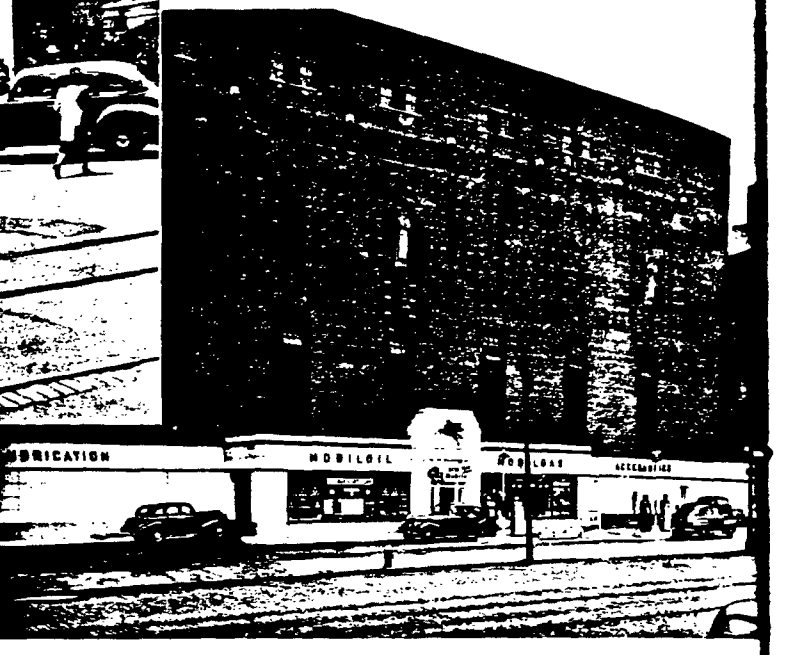
Many municipalities have amended their zoning laws to make parking space an essential feature of all new structures. Detroit, for example, figures that each car takes up 160 square feet of space and that all types of building must provide garaging space according to a table. In Los



Department stores in various cities have built garages in order to provide convenient parking space for their customers. This 600-car structure shows how Foley Brothers in Houston, Texas, is making shopping attractive to motorists

ETC 24097

Left, San Francisco's Union Square garage is located under a city park. It provides parking space for about a million cars a year, and pays its way



Right, New York's Parkchester apartments have garages attached. These units serve 20,000 people with most of their motoring needs

Angeles a city ordinance provides that all buildings in the downtown area must have one parking space for every 1,000 square feet of useful office space. This parking space must be within 1,500 feet of the building.

General Petroleum Facility

A six-story spiral garage provides parking facilities for the new General Petroleum Building in Los Angeles. It not only meets zoning requirements but is typical of a trend in modern downtown office building construction. This recently completed structure consists of a gently rising enclosed spiral ramp, 60-feet wide, which goes from the basement to the roof. Cars are parked along both sides of two center traffic lanes. After parking his car the driver can descend to the street by either elevator or stairs, both of which are located in the central core of the spiral.

Two gasoline pumps are located on the ground floor. A complete service station, with lubrication, and wash racks, is on the roof. This site was chosen to eliminate congestion when business is brisk on the ground floor.

The success of this and other recent projects indicates to many authorities that even at postwar costs, this type of garage can be profitable as well as in the public interest.

The most widely used type of construction for multi-storied garages is the ramp type of garage. Push-button garages using elevators and other mechanical gadgets have not been as widely accepted as the ramp types which today predominate in construction programs.

In keeping with the trend to provide room to park, many new housing projects are incorporating ramp garaging facilities into their plans. The Metropolitan Life Insurance Company's Stuyvesant Town project on the lower East Side of Manhattan calls for the garaging of about 2,000 cars. Garage floors are at low basement level, and the area above them provides play ground and recreation space. Stairways lead from each garage to convenient entrances to neighboring apartment buildings.

Parkchester Experience

What the future holds for apartment garages can be estimated from New York's Parkchester development. There, the garaging development serves some 20,000 persons, the equivalent of a small city. Service station facilities are available to tenants who find the arrangement unusually convenient. For example, the typical automobile - owning tenant can have his car serviced at any time that he is not using it. He doesn't have to leave the building and his car is always easily accessible.

Department stores, too, have had

some unusual surprises in connection with the operation of garages. Many of these institutions have gone into the garage business because motoring customers are served better when parking facilities are available. Although frequently a profitable undertaking, the garage is not expected to pay for itself, but to bring customers into the store. In addition it serves to improve the neighborhood by relieving congestion.

Seeing the automobile as an important factor in the scheme of things, the Central Houston Improvement Association, consisting of Houston business leaders, has a new development program underway which promises the motorist attractive parking facilities. A 60,000-foot area was selected adjacent to the Merchants and Manufacturers Building. There a six-story-and-roof structure would be built to house over 1,500 cars.

A survey revealed that 500 car spaces would be required in the facility for tenants of the Merchants and Manufacturers Building alone. Another 900 car spaces would be required for transient parking, and overnight parking could be expected with special services arranged with hotels and railroad stations. Space is also allowed for storage use of car dealers in the district and, in addition, 100,000 square feet was made available for general warehousing. A theater is also added to the top of the structure.

This is an example of a plan that serves many groups in the community and it is typical of a movement gaining power in our large cities to make the motorist feel at home. The automobile made the garage a part of American home architecture. Now it is about to become an integral part of many more of our new urban commercial and residential developments.

WILLARD H. DOW
1897 - 1949

The tragic death of Dr. Willard H. Dow, president and chairman of the Dow Chemical Company and former president of the Ethyl-Dow Chemical Company, marks the end of a distinctive career in the chemical industry. Dr. Dow, 52, and his wife and three other persons were killed on March 31 when their private plane crashed near London, Ontario.

Dr. Dow and his party were heading for Boston, Mass., when their plane plunged into the ground a mile from the London airport. Other victims were Mrs. Calvin Campbell, 45; pilot A. J. Bowie, and co-pilot Fred Clements. They were all from Midland, Michigan.

Dr. Willard Henry Dow was elected president and general manager of the Dow Chemical Company on October 15, 1930, following the death of his father, Dr. Herbert Dow. The senior Dow had been associated with the development of "Ethyl" antiknock compound ever since 1924 when Charles F. Kettering and the late Thomas Midgley, Jr. visited him to inquire about obtaining supplies of bromine.

Dow Chemical Company was then producing practically all of the bromine in this country from Michigan salt wells. Dr. Herbert Dow, however, agreed that those brine wells would never meet Ethyl's demands. Ethyl and Dow research chemists went to work on the problem and produced a plan to build an oceanside plant that would extract the bromine that is present in sea water in the ratio of 67 parts to a million.

Plans for the first sea water chemical plant began to materialize when Ethyl and Dow formed Ethyl-Dow Chemical Co. in 1933 to handle the bromine extraction process. Dr. Willard Dow became president of Ethyl-Dow at its inception and served until October 29, 1946, when he was succeeded by Ivan F. Harlow.

He was graduated from the University of Michigan in 1919 and held a number of honorary degrees. He served as a member of the Chemical Advisory Committee, Army and Navy Munitions Board and was a member of the Chemical Warfare Service and Advisory Board. Dr. Dow served with the regular army in the first World War.

ETC 24099

Memento Mania

Take a backstage look at the unusual business of keeping the American tourist supplied with souvenirs of his travels

When the average American tourist takes to the road to look over his country he acquires what is known as a "tourist frame of mind." He has a strong desire to spend his money, and one of the things he wants most to spend it on is some little knick-knack that will let his friends know where he has been. This frame of mind has been responsible for the souvenir business – a business that today tallies up to $250 million a year.

The lowly postal card alone accounts for $10 million of that total, with at least a billion of them sold every year. In Atlantic City alone, 50 million cards are sold a year and out of this Uncle Sam collects almost $500,000 in the sale of one-cent postage stamps. Other mementos range all the way from a five-cent good-luck charm to a $100 brass model of the Statue of Liberty, equipped with lights and a clock.

This season is expected to be one of the biggest in the history of the souvenir business. Souvenir makers are as sure of this as you are of paying taxes. They are sure because through the years they have learned that their business closely follows automobile production and gasoline demand. The motoring public accounts for most souvenir sales.

It is axiomatic among souvenir people that the size of a town has little to do with its potential as a souvenir center. For example, although New York and Chicago are the largest cities in the country, their souvenir business is only a fraction of that done by that honeymoon haven, Niagara Falls. This city outshines any other spot in the country as an outlet for souvenirs, but there are many places, off the beaten path, which do a thriving business in keepsakes. One of them is Santa Claus, Indiana, souvenirs of which naturally have a wide appeal among children.

Generally speaking, historical landmarks, unusual places such as the Corn Palace at Mitchell, South Dakota, and playgrounds, zoos, parks and vacation and resort areas are good souvenir locations. Most of the people who buy souvenirs are tourists making quick jumps about the country. They feel that each stop will be their one and only visit, and they want to make the most of it. Points of interest located miles from the main highway seem to offer some sort of a challenge that makes them all the more attractive as a source of souvenirs. This is especially true of caves and canyons.

One of the largest firms in the souvenir business is the Goldfarb Novelty Co., of Jersey City, N. J. The company has in stock or production at all times between 1,000

ETC 24100

and 1,500 separate items. Its staples include ash trays, salt and pepper shakers, plastic banks, cigarette boxes, paper weights, letter openers, powder boxes, perfume bottles, compacts, pennants, lighters, knives, buttons and Indian trinkets. There are, too, a wide assortment of trick merchandise, a whole separate catalogue of leather items, and such specialty items as miniature baseball bats, ice skates, and boxing gloves for sale at championship baseball games, prize-fights, and so on.

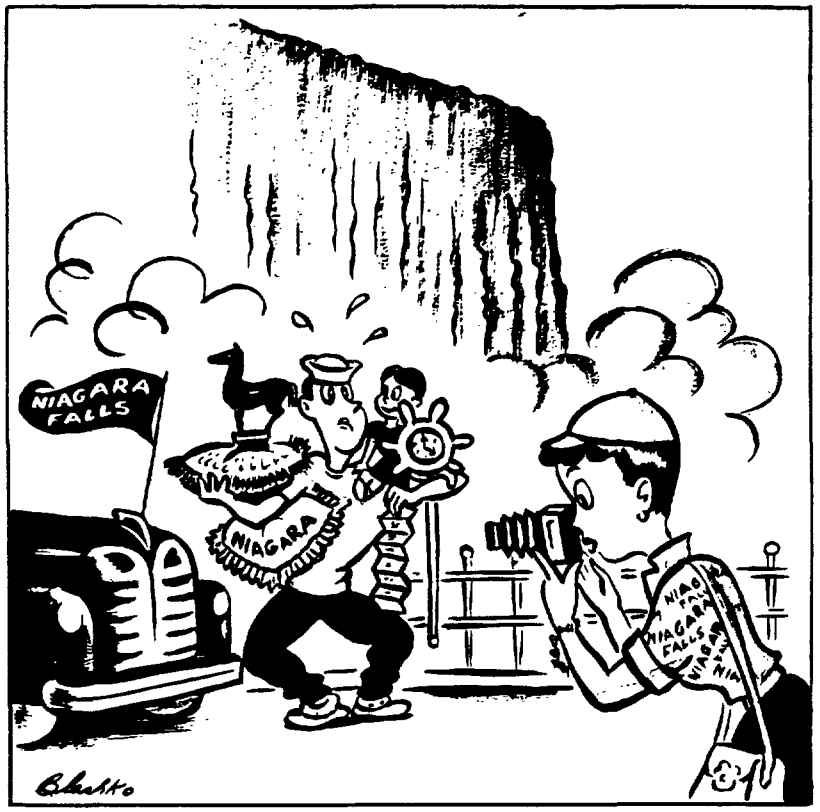
This heterogeneous mass of merchandise is all produced from raw or semi-finished materials at the company's factory. The firm tries to make virtually all of its line to retail for a coin. Experience has taught memento merchandisers that five- and ten-cent items move fast, fifty- and seventy-five-cent units move more slowly, and when the price goes over a dollar, activity slows down to a turtle's pace.

Most souvenirs start through the factory as prosaic ash trays, salt shakers, and so on. It is in personalizing the item that the souvenir gains its special significance to its ultimate owner.

An Added Touch

If, say, the item is a glass ash tray, a full color scene from Mammoth Cave might be processed on the underside. As you might guess, the decalcomania is used on almost every type of souvenir imaginable, and often is touched up with oil paint to simulate an oil painting. A surprising number of leather items, however, have completely hand-painted scenes on them – and they still sell for less than a dollar.

Although the popularity of a new novelty item is extremely difficult to judge, many of the old-timers of 25 to 50 years' vintage, surprisingly enough, are still on top.



Pennants sell better today than they ever did. People still want something they can attach to their car while traveling or pin on their wall to show the home folk where they've been. Paper weights and ash trays, because of their usefulness around the house, are still prime movers. And the bullet pencil has been on the best seller list for more than fifty years.

The key chain and good-luck piece still top most other items, because of their low cost and ease of handling. But don't think that statuary doesn't move – off retailers' shelves. Animals outsell everything else in this category; among them, the horse outranks the dog in people's preference. Love for the horse runs so keen that one Western retailer does a surprising business in super-deluxe, jeweled-saddle models selling for $75. At the zoo, however, the elephant is most popular, followed by the monkey and then the bear.

Years ago, there was no demand for useful souvenirs. Today, it's the other way around. If a manufacturer can't find a useful purpose for an otherwise attractive article, the chances are he'll attach a thermometer to it, at the least.

In keeping with the trend toward usefulness, the T shirt in recent years has become very popular. When sold as souvenirs they are stamped with "Asbury Park," "Fort Monmouth," "Indianapolis Speedway," or some identifying message. Hats have also joined the apparel parade in a similar manner. Tyrolian hats are popular in mountainous regions and peaked hats around beaches. Many children love yachting hats. Zoos sell them by the hundreds, and a top seller this year has an impressive "Lion Tamer" stamped on it.

Souvenir dealers have learned that

their own tastes in souvenirs are no guide to public demand. People will buy almost anything. For instance, although bright-colored, satin pillows with "Mother" stamped on them are on their way out, they still sell well in certain areas. Gaudy, brass, bejeweled statuary has always been in demand. And a New York promoter made a fortune by selling rabbits' feet. He sells about a million a year to people who want to keep bad luck away.

People in charge of stores for the tourist trade speak a jargon all their own. Painted turtles in almost every color of the spectrum are known as "Galloping Lizzies." An item that gets the brush-off from customers is a "stiff," an item that sells like hotcakes is a "runner," and when it breaks all records it's a "football."

When buying souvenirs, a man will usually remember his mother, his sweetheart, his wife or his children. But when someone else is doing the buying, the male members of the family are usually forgotten. Men are apt to buy women lockets or sewing kits. Women's tastes are unlimited.

Wherever people go, they have an intense desire to prove to their friends and neighbors that they've "been places." This feeling is especially strong in New York City.

As part of this, Macy's and Gimbel's department stores have scores of out-of-town customers who insist on an identifying label on merchandise to prove its genuine New York origin. One popular Fifth Avenue store makes an effective selling point with a conspicuous label on its garments sold to visitors.

Naturally the Statue of Liberty, the Empire State Building, and Rockefeller Center are New York symbols which are well represented among the souvenirs of the nation.

OUR COVER: While most of the nation was still playing host to Old Man Winter, Spring came to Louisiana. Azaleas, famous throughout the Pelican State, burst into bloom in March, surrounding many Baton Rouge homes with breath-taking colors such as shown on our cover.

OUR PICTURES: Pages 9-11, courtesy Great Lakes Pipe Line Co.; Page 14, courtesy General Petroleum Corp.; Page 15, courtesy Ramp Buildings Corp.; Page 16 (top left), Wide World, (top right) courtesy Socony-Vacuum Oil Co.

These colossal edifices are pictured on wallets, compacts, letter openers, cigarette boxes, ash trays – almost any knick-knack imaginable. But even household appliances – such as electric toasters, mixers, radios, and hot plates – carry a cheery "Greetings from New York."

On the other hand, souvenirs from many places are often on sale at one location. Take the case of the Times Square souvenir dealer who makes a specialty of producing souvenirs from all parts of the world.

He points out that many people return from abroad to discover they have forgotten some one back home. A memento from Paris, Rome, London, or Mexico City, therefore, is a must to save the social graces. Another type of customer is the fellow who likes to pretend he is a man of the world. "This type has never been across the Hudson, but he sends his friends souvenirs from all over the country," the dealer explains. And, of course, the dealer continues, some husbands start out for distant points but just happen to get stuck in New York. "We are ready for them, too. We can supply a souvenir for almost any important city in the country – right here in New York."

ARTERIES FOR FUEL

(Continued from page 11)

Nerve center of the pipe line system is the dispatching room, located in the company's headquarters in Kansas City. Here, in a modernly-equipped and sound-proofed room, a staff of dispatchers maintains a constant check on products moving through the lines. A circular chart of the area he is dispatching, mounted on a turntable, is before each dispatcher, and he can tell at a glance the location and movement of every shipment.

Every hour a telephone check is made with every pumping station and receiving terminal in the system. Great Lakes has its private telephone lines running along each of its pipe lines except on the Northwest Line where it uses leased wires. It also has a battery of teletype machines for transmitting orders and reports.

When a shipment arrives at a distribution terminal, it is put into tankage until withdrawn for the account of the shipper. Meanwhile, the incoming product is tested to insure that it conforms to specifications and tested again before it is loaded onto a tank car or tank truck for its final destination. In addition, products in the tanks at the Great Lakes terminals are regularly tested every seven days, if they have not been withdrawn in the meantime.

Each of the terminals has a completely equipped testing laboratory, with a central control laboratory for the system located at Kansas City. Ten of the 14 terminals, moreover, have blending plants where regular and premium grades of gasoline are treated with "Ethyl" antiknock compound. Great Lakes customarily blends gasoline at these terminals as a service to its shippers.

With a shipment now at a distribution terminal, the role of Great Lakes Pipe Line changes from that of a carrier to that of a bank. It has so many barrels of say, gasoline on "deposit" for an oil company; it now assumes the responsibility for disbursing that fuel for the shipper.

Great Lakes is authorized to disburse products in two ways. One way is for a refiner to authorize the disbursement of a given amount of its product. This is a limited order. The other way is for it to permit the delivery of an unlimited volume for an unlimited period.

Either way, Great Lakes has on file, at each of its terminals, the signatures of all persons authorized to withdraw products belonging to any supplier. Thus, when the driver of a tank truck pulls into a terminal to pick up a cargo, he has to present an order to that effect. The signature must be the same as on file as an authorized agent of the shipper. When his truck has been loaded, the driver receives a bill of lading covering the amount of products delivered to him while a second copy is sent back to the shipper.

Each terminal is equipped with both tank truck and tank car loading facilities. In addition, Great Lakes owns more than 6,900,000 barrels of gross tankage, of which a capacity of over 5,800,000 barrels is located at its distribution terminals.

The Great Lakes system covers a distance, from south to north, of approximately a thousand miles. Substantial differences in temperature, altitude and climate are of course encountered at all times. Because of this, the weather plays an extremely important part in the system's operations and scheduling of shipments.

To guide it in its operations, Great Lakes makes use of a long-range weather forecasting service. The value of this service has been repeatedly demonstrated.

For example, an early Spring was predicted for last year. This meant that gasoline demand would expand earlier than usual. Accordingly, Great Lakes advanced the dates for accepting gasoline of lower volatility. As a result, there were adequate supplies on hand in its northern terminals, when the Spring gasoline demand developed. At the same time, it did not have to carry over large stocks of distillate to the Fall.

If the transportation functions of a pipe line system are unique, so is the maintenance that is required. Care is taken at every point to guard against contamination of products and against corrosion and leaks. Reflecting the high standards of maintenance, product losses of all kinds – including in-transit losses and those from evaporation – have been kept to a fraction of one percent.

Handling Mixing Problems

As different products follow each other through the same pipe line, the problem of mixing is ever present. Scheduling their movement in proper sequence so that two highly sensitive grades are not moved in adjoining shipments, the use of swing arrangement line connections at stations and terminals which do not allow products in adjoining lines to come into contact, thus eliminating complex manifolds or switching apparatus, and the use of centrifugal pumps which impart a steady pressure to the stream – these are several of the methods employed to keep mixing at a minimum. As the area of contact between products increases in proportion to the diameter of the pipe, the relatively small diameter of Great Lakes lines is another factor in curtailing mixing.

Great Lakes within the past year-and-a-half completed a $30 million expansion program that included the laying of 1,200 miles of additional lines, the construction of eight new

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delivery terminals and 14 primary pumping stations, and the remodeling of two terminals and 14 existing pumping stations. The expansion increased its capacity by 50%.

But while the expansion program was still underway, Great Lakes was faced with a serious problem: It needed a greater capacity than it had in sight. In the face of prevailing steel pipe shortages, it had but one alternative. This was to build new secondary pumping stations to increase the throughput of existing lines. But where was it to get the necessary equipment in a hurry?

Casting about for a solution, the company suddenly seized upon some war surplus aircraft engines as prime movers for the stations. As Charles C. Keane, chief engineer of Great Lakes, explained, "Aircraft engines had never before been adapted for industrial use. Nevertheless, we were confident that a number of 12-cylinder Allison engines, which were available as war surplus, would serve our purpose in the emergency."

After extensive changes in their instrumentation and operation, the engines were hooked up to pumps in the secondary stations. Instead of powering Airacobras and P-51's, as engines of this type did during the war, they were now delivering gasoline and fuel oil to hard pressed consumers in the Mid-West. These engines enabled Great Lakes to deliver 3.7 million barrels of products more, over a period of a year, than would have otherwise been possible.

Typical of the new installations in the Great Lakes system is the distribution terminal at Sioux City.

The terminal, which is both a distributing center and a relay point to Sioux Falls and beyond, has the latest equipment for loading tank cars and trucks; contains a pumping station, a service building and a gasoline blending plant; and has 30 working tanks of 363,000 barrels capacity. The three largest tanks, of 30,000 barrels capacity each, are of the lifter roof type, and each one is connected with a series of cone roof tanks to form a closed vapor recovery system.

All of the tanks have been so designed as to provide the greatest flexibility of operation. Each tank has its own incoming and outgoing lines, its individual pump, and a specially designed manifold. These features permit the tank to function independently of any other. Whenever there is a heavy demand for a given product, two or more tanks containing that grade can be connected to a single delivery facility. When the demand slackens or changes, any tank may be quickly converted by the station crew to another grade usage, without having to rebuild the piping layout.

Streamlined Operations

At Sioux City, too, is the new swing line arrangement which separates that stream from any other line. Individual delivery lines from each tank, moreover, flow direct to the loading units. Furthermore, an antiknock compound and identifying dye line is common to terminal tankage. As soon as the "Ethyl" antiknock compound has been blended into the gasoline contents of a tank, the tank is closed off and the gasoline is circulated within the tank by means of the tank pump and a spider arrangement.

All of the tanks at Sioux City are connected to above ground pipe runs, which may be easily traced.

One of the outstanding facilities at the Sioux City terminal is the tank truck loading building. A truck drives through an underpass on either end of the building and stops directly beneath the loading platform. This platform, which moves up and down on four hydraulically controlled supports, is lowered to a point level with the top of the transport, thereby affording the loading operator complete safety and freedom of movement.

A pantograph arrangement of piping is a vital part of the loading machine. By means of it, an operator can load any of nine different grades of products, simply by selecting one of the nine movable pipes in the layout. Trucks are loaded at the rate of 300 gallons a minute, and the flow is automatically cut off once the desired volume is reached.

After a truck has been loaded, the loading platform is raised, the driver receives a printed record of his load from an automatic printer, and he drives his cargo out of the terminal. The truck loading building has a loading platform on each of two sides, permitting it to load two trucks at once.

Great Lakes Pipe Line Co., which was organized in 1930, is owned by eight oil companies. They are Continental Oil Co., Mid-Continent Petroleum Corp., Sinclair Refining Co., Phillips Petroleum Co., The Texas Co., Skelly Oil Co., Cities Service Oil Co., and the Pure Oil Co. In addition to these companies, it currently serves refineries owned by nine other companies.

Under the direction of Harry Moreland – who was vice president and general manager of Great Lakes from its organization in July, 1930, to March, 1942, and president since then – the company has grown from a single line running from Oklahoma to Chicago into the largest products pipe line system in the country. If today people in even the remotest corner of the country can enjoy the blessings of modern fuels and modern engines, one reason is that pipe lines have brought these things within their reach.

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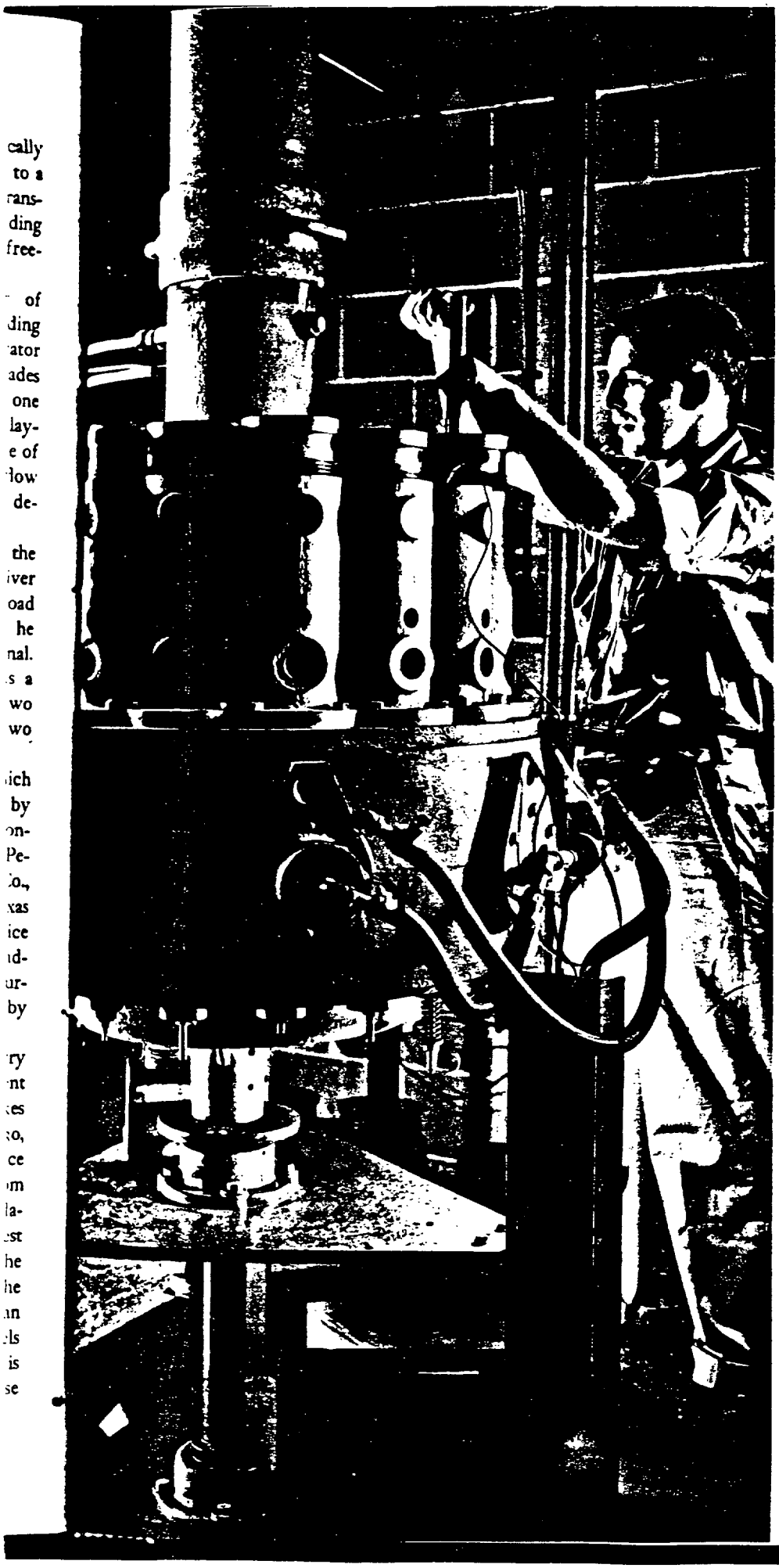

STRESS ON STRESS

One of the contributions of the Ethyl Corporation Research Laboratories to aviation progress is the constant testing of aircraft engine metal alloys to determine their behavior when stressed at high temperatures in atmospheres produced by burning leaded fuels.

These studies are conducted in a special stress-corrosion furnace which Ethyl designed and developed early in the recent war at the request of the Army Air Forces. Only three such furnaces have been built and are in use. One is at the Ethyl Laboratories in Detroit. The others were obtained by the Air Matériel Command and the Navy Department's Bureau of Aeronautics.

The furnace tests and compares metals presently used in valves and those turbine parts which are exposed to combustion gases. It also evaluates the corrosion-resistance qualities of metals that might be used for such parts in the future.

In a stress-corrosion test, samples of steel or other alloys are placed in the cylindrical "specimen stations" which form the uppermost unit of the furnace. A center casting rotates within the outer casting of the furnace and, in so doing, passes first the combustion flame and then the exhaust gases over the metal samples.

Flame contact with the sample can be regulated to any specified time interval between two seconds and 5½ minutes by varying the hearth speed from 31 revolutions per *minute* to 11 revolutions per *hour*. Metal samples can be subjected to stresses varying from 1,500 to 80,000 pounds per square inch, and to temperatures as high as 1,800 degrees F.

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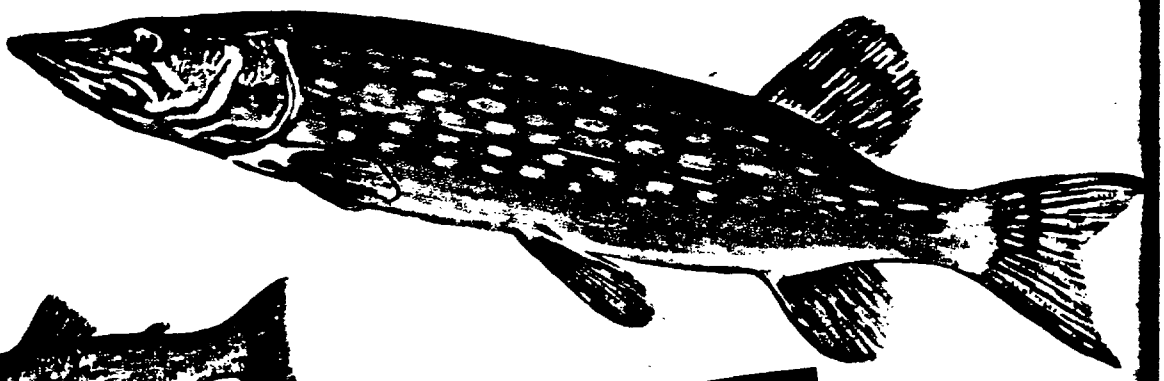
*Prepared in cooperation with specialists of American Museum of Natural History, N.Y.



Pike. Upper half of gill cover, and usually the whole cheek, is scaled. **Pickerel** (*not illustrated*). Whole gill cover, and usually the whole cheek, is scaled.

Trout are marked by a group of distinguishing characteristics. For example:

(A) **Rainbow** (Steelhead). Many strong teeth in zig-zag rows on roof of mouth. Tail fin is usually spotted.

(B) **Lake Trout.** Teeth on roof of mouth on an elevated crest. Has teeth on base of tongue. Red or pale spots on body. Tail is forked.

(C) **Brown Trout.** Brownish, rather large scales. Red spots on sides surrounded by light rings.

(D) **Brook Trout.** No teeth on base of tongue. Red or pink spots on sides. Lower fins with light-colored edges. Tail is square or only slightly forked.

When you go fishing

THE "TRADE-MARKS" OF NATURE*

identify these fighters

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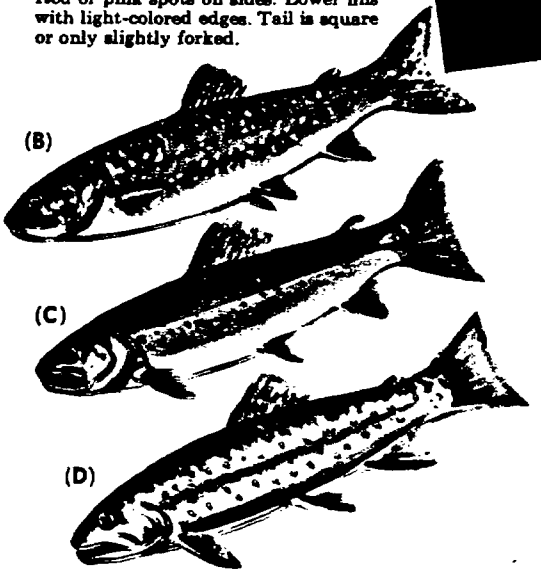
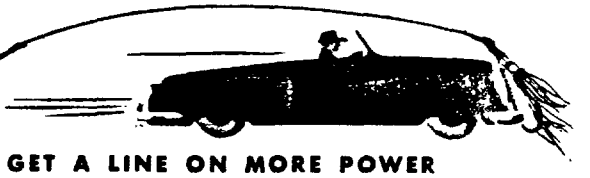


When you buy gasoline

THE TRADE-MARK "ETHYL"

identifies gasoline stepped up with "Ethyl" antiknock fluid



TO GET A LINE ON MORE POWER

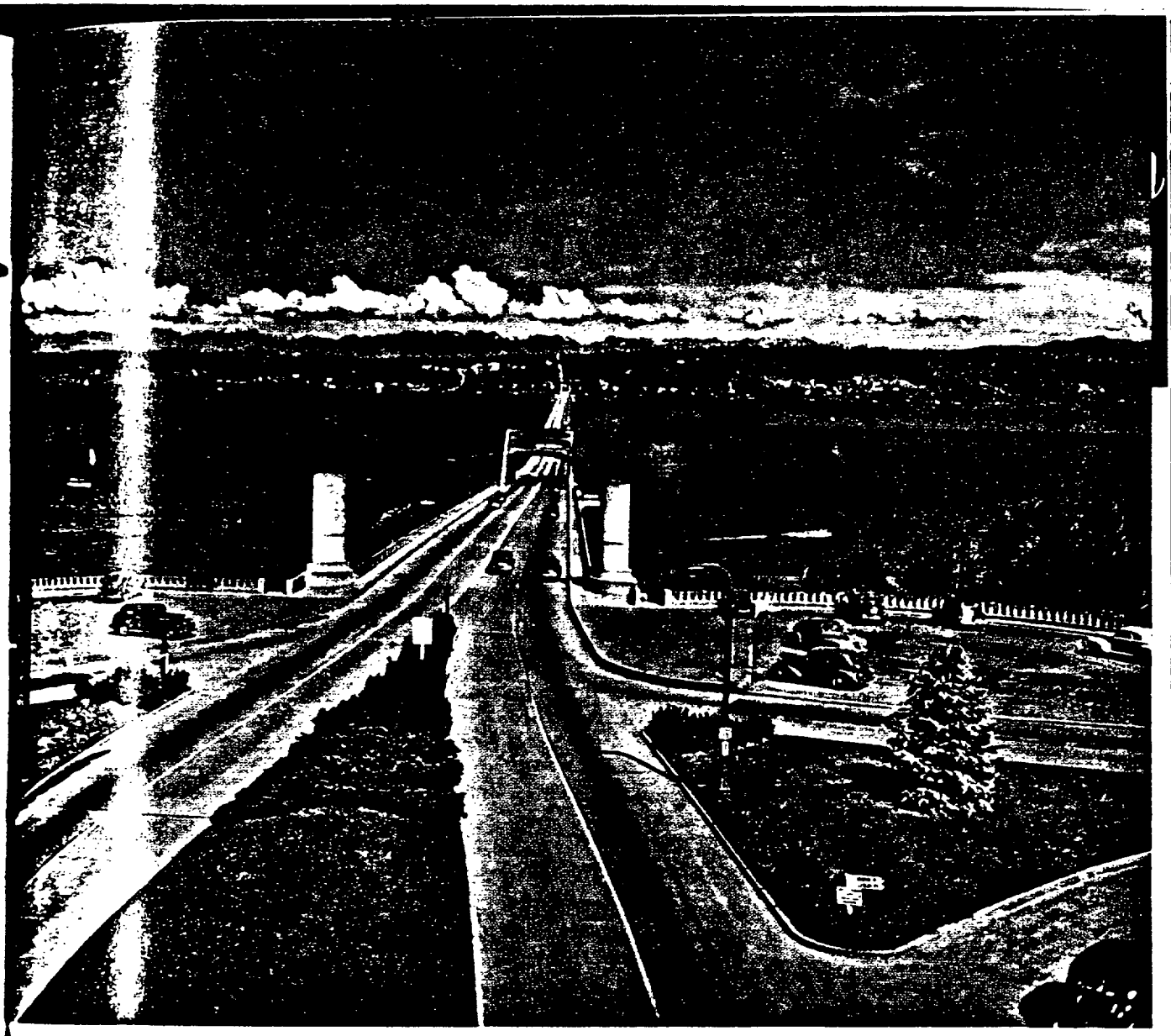
. . . to reel off miles of smooth, enjoyable driving

. . . to help your engine run at its best

. . . to feel the thrill of top performance on the open road and in city traffic

. . . ask for "Ethyl" gasoline—high quality gasoline improved with "Ethyl" antiknock fluid, the famous ingredient that steps up power and performance.

"Ethyl" antiknock fluid is made by **ETHYL CORPORATION**, *Chrysler Building, New York 17, N. Y.*



ETHYL NEWS

JUNE ★ 1949 ★ JULY

ETC 24107

IN THE

ETHYL NEWS

JUNE-JULY 1949

John H. Schaefer, vice president and general manager of manufacturing for Ethyl Corporation, was elected president of the Industrial Research Institute for 1949-50 at the organization's 11th annual meeting at Asbury Park, N. J., recently. He succeeds E. W. Engstrom, vice president in charge of research, RCA Laboratories division, Radio Corporation of America.

The Industrial Research Institute promotes high standards in industrial research, and develops improved techniques of organization and operation. Its membership includes executives representing more than 110 companies and 20,000 research workers in widely varied industries.

In addition to serving as president of the Institute, Mr. Schaefer will continue on its board of directors. He is a former vice president of the organization and served as chairman of this year's program committee.

Mr. Schaefer, a vice president of Ethyl since 1943 and a member of its board of directors and executive committee, has been associated with the company for 23 years. A bachelor of science graduate of the University of Delaware, and the holder of a master's degree in chemical engineering from Massachusetts Institute of Technology, Mr. Schaefer is active in chemical, engineering and management organizations. He is a member of the board of directors of the Ethyl-Dow Chemical Company, the Lead Industries Association, and the Baton Rouge Chamber of Commerce.

DYNAMIC COMPETITION 3

Using the oil industry as an example, the authors of this article suggest a new approach to an understanding of American business life. They cite case histories of petroleum products prices to demonstrate the true nature of competition, and show how the concept of dynamic competition more accurately describes American business in action.

DOES DESTINY FOLLOW A PATTERN? 7

The more we learn about cycles, the more we realize that they affect almost everything we do. The stock market, the mouse population, and even your emotional behavior go around in cycles. This story tells what scientists have learned about these interesting phenomena.

THESE ROADS RATE 10

Driving conditions encountered all over the United States are duplicated in a comparatively small area. That area, consisting of the roads and highways of Southern California, is ideal for testing fuels and engines.

SPANNING THE YEARS 14

One of the nostalgic reminders of yesteryear is the covered bridge. Although they're slowly fading from the scene, here's a picture gallery of some of them which are still in service.

"A" IS FOR AUTOMOBILE 16

Automotive progress can be measured by words. Engines are no longer "cranked," the "spark lever" isn't around to be adjusted, "running boards" are all but gone, and there are no more "phaetons" and "landaus." On the other hand, motorists are adding a lot of new terms to their vocabularies — to keep abreast of the times.

PEAKS OF DISCOVERY 19

Oil operations in the Rockies are setting records in many directions. The region claims the highest oil fields in the country, on the one hand, and the deepest well drilled to date, on the other. And — it also promises to add materially to our known oil resources.

In order to widen the fields of reader interest in Ethyl News, we frequently publish articles contributed by writers not associated with Ethyl Corporation. Opinions expressed in signed articles are the authors'. The editors of the News welcome articles of timely interest submitted from outside sources.

Published by ETHYL CORPORATION, 405 Lexington Avenue, New York 17, N. Y.

Manufacturer of "Ethyl" antiknock compound, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, secretary

ETC 24108

Dynamic Competition

By Raymond Rodgers and H. E. Luedicke

EDITOR'S NOTE: *Important and interesting to every oil man is the accompanying article, which appeared in the Harvard Business Review (March 1949). The authors advance the theory of dynamic competition as expressive of American business life, and cite case histories of oil products prices as examples of dynamic competition in action. The evidence, they declare, "provides a continuous, moving picture of a dynamic, ever-changing competition."*

Professor Rodgers is a member of the faculty of the School of Commerce of New York University. Dr. Luedicke is executive editor of the New York Journal of Commerce. Ethyl News is indebted to them, and to the editors of the Harvard Business Review, for permission to bring the major portion of their significant study to the attention of a wide audience in the oil industry.

IDENTICAL or nearly identical prices are often quoted by rival companies. Is this a sign of collusion and hence of weak competition? Or is it the result of constant pressure to meet competitors' prices and thus indicative of a highly competitive situation? Of course both of those contradictory questions can validly be answered with "yes" – or, for that matter "no" – *under certain sets of conditions*. The resulting confusion in economic thought, with different groups taking opposite theoretical stands and urging contrary national policies, is damaging both to the cause of business progress and to the welfare of the whole country.

Of extreme significance, therefore, is the need for some method to test the "competitiveness" of business pricing in individual industries, perhaps even to the extent of measuring it statistically.

Dynamic Nature of Pricing

We should like to propose that the *variation in the spread between prices of rival sellers over a period of time* be considered as a gauge for this purpose. It is our conviction (1) that much of the confusion in economic thought about pricing is due to the fact that many of the theoreticians have not considered sufficiently the dynamic nature of pricing, that is, the way it changes and shifts in response to varying conditions under the administration of individual businessmen; and (2) that the observation of periods of relatively wide divergence between the prices of rival companies alternating with periods of narrowing spreads and at times identical prices, in a pattern that can be correlated with such factors as seasonal and business fluctuations, provides a continuous, moving picture of a dynamic, ever-changing competition.

Accordingly, we shall attempt in this article to point out a few of the reasons why economic theory, as presently formulated, seems to us to be an insufficient explanation of the realities of American business life; to outline a more vigorous approach to understanding price competition, in the hope that others will experiment with it in a wide range of industries; and to cite one illustration of how our concept of "dynamic competition" might be applied to a concrete industrial situation which we have studied in some detail.

Up to about two decades ago a long line of earlier writers had elaborated a theory of perfect or pure competition. Upon the foundation of an assumption of perfect competition, a great structure of reasoning had been erected by Cournot and his successors among the mathematical economists, as well as by the several schools of deductive economics. Parallel with the theory of pure competition, the theories of monopoly, which exists where the seller controls supply and price, and of oligopoly, which results from the dominance of several sellers, were evolved and perfected. Both these sets of theories vastly oversimplified the facts of business life at the time, and business life today is even more complex.

Subsequent Theories

The 1930's brought to a head efforts to provide a more realistic explanation of the working of competition in our economy. In 1933 two notable works, Joan Robinson's *Economics of Imperfect Competition* and Edward Hastings Chamberlin's *Theory of Monopolistic Competition* appeared.[1] Chamberlin describes the price system as "a

AUTHORS' NOTE: We are indebted to the Board of Directors of the Socony-Vacuum Oil Company for permission to use material gathered in the course of a study prepared for their use.

[1] Joan Robinson, *Economics of Imperfect Competition* (New York, The Macmillan Company, 1933); E. H. Chamberlin, *The Theory of Monopolistic Competition* (Fifth Edition, Cambridge, Harvard University Press, 1946).

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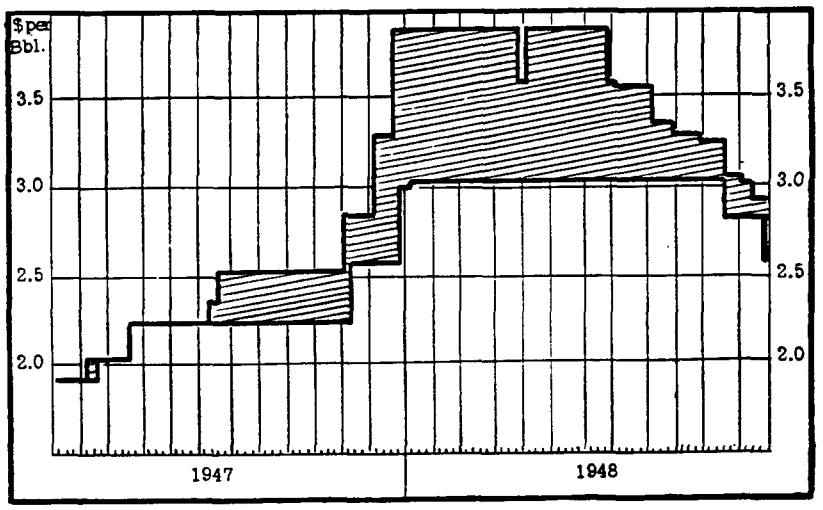

EXHIBIT I. Price Spreads in No. 6 (Heavy) Fuel Oil in the New York Wholesale Market

composite of purely competitive markets, of monopolistic markets, and of markets where monopolistic and competitive influences are variously commingled" [p. 11].

The mixture of monopolistic and competitive influences, Chamberlin argues, has become very widespread as more and more sellers have differentiated their products from those of their competitors through trademarks, patents, peculiarities of packaging, location of selling outlets, specialized service, and other types of nonprice competition. Furthermore, he insists that the term "monopolistic" as he uses it must not be taken in an invidious sense:

> To say that each producer in an industry has a monopoly of his own variety of products is not to say that the industry is monopolized. On the contrary, there may be a very intense competition within the industry, not of the sort described by the theories of pure competition, to be sure, but different by virtue of the fact that each producer has a monopoly of his own variety of product [p 205].

The picture painted by Chamberlin of an economy in which varying degrees of competition prevail within individual markets and industries has become widely accepted. It has been found by many to be more consistent with a number of the long-recognized facts of business life. Perhaps, also, it helps to explain what the Justices of the United States Supreme Court had in mind when they sought to distinguish between "reasonable" and "unreasonable" restraints of trade.

Variation in Degree

But this picture of different degrees of competition in different industries, in turn, is incomplete in that it does not develop the fact that the degree of competition which prevails in *any one industry or market* varies widely *from time to time.* It would be more realistic if it showed that in virtually every industry there are times when very little competition among sellers is apparent from price behavior and there are other times when competition among sellers becomes virtually "pure."

The businessman has evolved expressive terminology to describe these changes in the intensity of competition which prevail in a particular industry or market. He speaks of a "sellers' market" and a "buyers' market." Competition is limited in the first and quite highly developed in the second. Even in so highly competitive an industry as textile manufacturing it is recognized that there are times when virtual monopoly conditions, i.e., a sellers' market, prevail.

Many writers have noted, and some have studied, the obvious fact that competitive conditions in a market or industry change over a period of time. Alfred Marshall pointed out that demand is the main price determinant over short periods of time, while cost of production is more important over the longer period as price competition among sellers becomes more effective. Many other writers have discussed the "time lag" that occurs before price is adjusted to the competitive conditions that prevail in a given market.

The use of the very term "time lag" makes clear the fallacy involved. The term assumes that there is a state of "equilibrium" that will ultimately reflect the degree of competition that prevails in the industry or market; given time, the "equilibrium" price is reached and thus price is determined. But if competitive conditions are changing constantly, both on the selling side and on the buying side, this "time lag" becomes one of indefinite duration. Equilibrium is never reached. Instead there is a continuous shifting from more intense to less intense competitive conditions, or vice versa.

We believe, in other words, that competition as it functions in our society cannot be adequately explained as a *quantum*, greater in some industries and less in others, that ultimately produces a static, equilibrium price. It can be described accurately only as a dynamic, ever-changing force, varying over a greater or lesser range in response to ever-changing conditions.

That there are conditions which affect the degree of competition prevailing in an industry or market at any given time seems obvious. Among the more important ones are: (1) the phase of the business

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cycle, (2) technological conditions affecting demand for the product, (3) technological conditions affecting supply of the product, (4) changes in conditions determining product substitution, (5) monetary conditions affecting supply or demand, and (6) seasonal factors affecting supply or demand. The events of the past few years provide a rich reservoir of experience for illustrating the impact of some of these conditions and of others not listed. During the war a sellers' market became well nigh universal, and price competition largely disappeared. More recently, as supplies have been expanded, we have seen active competition return in one market after another.

'Abnormal' Explains 'Normal'

This phenomenon of response to market conditions, even when the conditions themselves are greatly exaggerated by wartime influences, is normal and typical. As so often happens in science, the abnormal helps greatly to reveal and clarify the nature of the normal. In every rapidly growing industry, in every period of prosperity, in every market where demand tends to outstrip supply, competition among sellers is at low ebb while rivalry among buyers may become intense. Conversely, in every stagnant industry, in every period of depression, in every market where supply tends to outstrip demand, we see the reverse situation in which competition among buyers is at low ebb while sellers compete vigorously by lowering prices and otherwise. And because the conditions affecting competition change constantly, there is continuous variation in the degree of competition that prevails in most cases.

The important question is whether this kind of sensitivity to conditions which denotes what we call dynamic competition can be demonstrated statistically. . . .

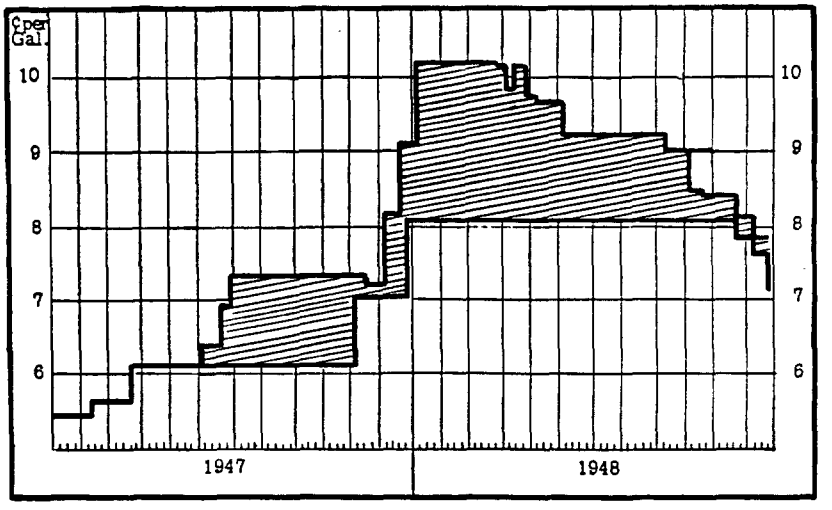

EXHIBIT II. Price Spreads in No. 6 (Heavy) Fuel Oil in the New York Retail Market

Based on our own studies of price behavior, we believe that the frequency and duration of periods of identical prices in a market, upon which the Federal Trade Commission would place reliance, can be quite misleading as a measure of competition. Periods of price identity are only a part of the statistical evidence, because they alternate with periods of price divergence which may be far more indicative of the degree of competition that prevails.

The Director of the Bureau of Industrial Economics of the Federal Trade Commission came close to explicit recognition of the dynamic, changing character of competition when he stated recently that diversity in prices from time to time is produced "by the intensity of the need for different sellers to seek additional business or for different buyers to seek additional supplies." He concluded that "this point alone recurrently destroys the identity of prices under competition; for just as some buyers pay a premium for goods in time of shortage, so some sellers cut their prices below the rest of the market when they are overstocked and their sales are slow." [2]

It is in such a connection that the statistical evidence provided by a pattern of price spreads over a period of time – in this case over both a sellers' and a buyers' market – would be particularly significant. Indeed it would go even beyond the conclusion reached by Mr. Edwards. For the tendency in a sellers' market is for spreads between prices of individual sellers to persist and to widen; while in a buyers' market spreads have a tendency to narrow and disappear rapidly because competition among sellers becomes intensified.

Undercutting of prices occurs frequently in such periods of intense competition, but the tendency is for spreads to disappear far more rapidly than in a sellers' market, for rival sellers must be very quick to meet lower prices in a buyers' market. Development of price spreads of very brief duration, lasting a day or so and sometimes even only a few hours, is typical of a keenly competitive buyers' market where rival sellers rush to meet lower prices of competitors. Under monopoly conditions or collusion, needless to say,

[2] Corwin D. Edwards, Director, Bureau of Industrial Economics, Federal Trade Commission, in a speech before the Machinery and Allied Products Institute, Washington, D. C., December 10, 1948.

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a price reduction would be simultaneous.

Application to an Industrial Situation

The most effective statistical evidence of dynamic competition would be the degree of variation in prices quoted by different sellers of a product within a given market. As the spread between prices quoted by different sellers widens and narrows for however brief a period, we see the dynamic changes in competitive conditions reflected. It is realized, of course, that part of the spread at times may be due to brand preferences, although this seems to be primarily a factor in the retail market rather than in the wholesale market. It is also true that nonprice competition, which may be very strong in different industries and at different times, is not measured by this device, and thus the degree of competitiveness may be understated. In some cases, on the other hand, variation in price spreads may reflect a shifting between price and nonprice competition as conditions change – but to the extent that it does so, it is simply further evidence of dynamic competition.

The authors have put the theory of dynamic competition to a statistical test, by applying it to a study of price movements of petroleum products in the New York marketing area over a period of time. Specifically we have charted the price spreads for major petroleum products in the New York City area for the two years 1947 and 1948. The study covers the price behavior of heavy (No. 6) fuel oil, both wholesale and retail; light (No. 2) fuel oil, both wholesale and retail; and the wholesale market for unbranded gasoline (no comparable data exist for a retail market in unbranded gasoline).

Prices used in the study are those quoted daily in the New York *Journal of Commerce*. The ranges shown represent the highest and lowest individual quotations ascertained by that newspaper each day as a result of telephone checks with principal sellers in each of the individual product markets. Sales below official postings are included in the spreads shown daily in the *Journal of Commerce* wherever they can be authenticated and attain substantial volume.

Almost Complete Cycle Shown

The two years 1947 and 1948 were selected for this graphic presentation because they show an almost complete cycle from the early stages of the postwar sellers' market to its peak in the winter of 1947-1948 and back again to conditions of oversupply, or the reappearance of a buyers' market, late in 1948. Spot checks of the New York market in other periods, notably the year 1938 when general business was declining, have been made and found to confirm the existence of similar price-spread patterns. . . .

Furthermore, it should add to the value of our illustration that during 1947 and 1948 the customers of the oil companies did not always feel free to shift their purchases from one source to another, because of the tightness of supplies and the emphasis on taking care of regular customers only, and that therefore there were times when it was relatively easy for individual sellers to "get away" with prices out of line with their competitors'. For this reason the spread between rival sellers' prices may well be greater at some points than it otherwise would have been. But that possibility is in line with the "dynamic competition" concept. In the first place, though the condition causing it was abnormal, the response to it was absolutely normal, demonstrating the way in which businessmen individually and without collusion adjust their prices differently to the market. In the second place, it shows all the more dramatically that the variation in the price spread is the result of sensitivity to conditions; and the fact that the bulging spread snaps back again to a thinner band or a line when the particular conditions change – i.e., when the factors that had temporarily dulled price competition are removed – shows that the subsequent uniform or more nearly uniform prices are in fact competitive.

In general, our study shows that the variation of spreads between prices quoted by competing sellers is partly seasonal, but mainly cyclical. And that is precisely what is to be expected under conditions of dynamic competition, for rivalry becomes more intense with less favorable business conditions and less keen when a sellers' market prevails.

Heavy Fuel Oil

Let us look first at the price-spread pattern for heavy fuel oil (EXHIBIT I). Competition was quite intense during the early months of 1947 before the postwar industrial boom attained its full stride; prices were then relatively low, and there were virtually no differences in prices of individual sellers. As industrial production expanded and ocean transportation became heavily taxed as a result of peak exports, the situation changed sharply: prices rose and larger spreads appeared between prices quoted by individual sellers. The approach of an extremely tight supply situation for the winter season of 1947-1948 was early signaled by the fact that the accumulation of

(Continued on page 24)

Does Destiny Follow a Pattern?

If at times everything seems to go just 'round and 'round, there's a reason. Scientists have found that literally everything from agronomy to zoology appears to run in a cycle

By Wilfred Weiss

IS THERE A PATTERN in what we do and what happens to us? It is a question that has long intrigued both the scientist and the quack. Right now it looks as if the scientist is approaching an answer, and will be able to show us that the world and its events do follow a pattern of rhythm, or a cycle.

Some 3,000 studies have been made in about 36 different fields, ranging from agronomy to zoology, by way of herpetology, human emotions and poetry. There is evidence that once the cycle of the growth of a yeast cell, or the birth rate of the beaver, or various financial activities have been charted, future activity can be anticipated to a surprising degree. This, however, is not to be confused with tea leaf reading, crystal gazing, or other fortune-telling devices. The study of cycles or rhythms is a coldly scientific pursuit, which deals strictly with verifiable concrete facts, and has no truck with such matters as which horse will win the fifth at Santa Anita.

While the study of cycles doesn't lend itself to the design of a three-horse parlay, other possibilities almost as intriguing do turn up.

There is, for example, what cyclists call the mouse crash: the sharp decline in mouse population every four years. In the United States the mouse population reaches its lowest point every Presidential election year. The cyclists, being scientists, make no comment about the coincidence, but just think of what an imaginative press agent for either political party could do with that.

Evidently rhythm patterns pervade the affairs of men as well as mice.

Gloom-to-Joy Cycle

Utility companies have discovered that the population in a given area will rise and fall repeatedly in a pretty regular pattern. From another approach, most people can recall that they go through periods of depression for no apparent reason, followed by periods of euphoria, also without evidence of outside influences. In England a few years ago, a study was published which charted the peaks and depths of inspiration for composers of music and poetry.

In this country, Professor Rex B. Hersey of the University of Pennsylvania brought it down to the mundane level in a study of industrial workers and executives. He found that there is a definite rhythm to the human emotional state.

His study revealed that each individual's pattern differs, and that while an individual's chart might occasionally fluctuate, it was never a difference of more than a week, regardless of outside influence. When, for instance, a man's pattern was upgrade he was increasingly optimistic — an argument with his wife or catching the devil from his boss, for instance, in no way lessened his feeling of all-is-right-with-the-world. While that feeling might last for six weeks rather than, say, the established five, there was no evidence that anything could alter the course of the cycle when it was due to change.

In the other direction, just at the time his cycle was due to go downward he might get a long-desired promotion or a substantial raise, or his home life might be particularly cheerful — but for that period of the cycle he would nevertheless be progressively pessimistic. Subjects of the study admitted that they had no cause for worry, that they were conscious of the fact that everything

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was going as they wanted it to—yet were unable to shake off the feeling of depression.

An incidental study brought to light a surprising fact. The subjects were not most efficient at their jobs when the pattern was rising. At the peak of the cycle, riding an emotional high tide, an ebullience of good spirits often led to a lot of visiting with associates, and an inclination to interrupt work for casual conversation. At that time it was most difficult to buckle down and concentrate.

But when the pattern was descending, they were likely to avoid associates. During this period, their feeling of pessimism made them anti-social and easily irritated; as a result, they stuck closer to the job, concentrated more, and accomplished more work and more efficiently.

The idea of the world and its affairs prescribing a cycle is as old as time itself.

Early Forecasting

Some researchers insist that Joseph predicting seven lean and seven fat years was forecasting on the basis of having charted past performance. Modern cyclists, however, are satisfied to go back no further than the early days of the last century, when the Hudson's Bay Company began to wonder about the variation in the number of pelts brought in by trappers each season.

In an especially good year, the Company might receive as many as 70,000 pelts, and it would need a large quantity of merchandise to pay the trappers. But it was unnecessarily expensive to keep the same quantity of merchandise on the shelves in years when the take might be only 4,000 skins.

Some unsung bookkeeper thought to chart these fluctuations, which revealed a rhythm of 9¾ years from peak to peak and valley to valley. There were variations, of course, and like most cycles the variations also had a rhythm. In this case, it was seen that every second peak was slightly higher than the preceding one.

The chart is credited with an important contribution to the company's success, and it has had an influence on the modern scientific study of cycles as one of the first carefully charted studies on this continent.

By 1931, work in the field of cycles had progressed to the point where it was felt necessary to have some kind of organization and a means of communication among students of cycles. A conference was called at Matamek, Canada, the result of which was the formation of a committee to act as a clearing house for cyclical research. Ten years later, the committee felt the need for a more effective organization and incorporated itself as the Foundation for the Study of Cycles, with Edward R. Dewey as director.

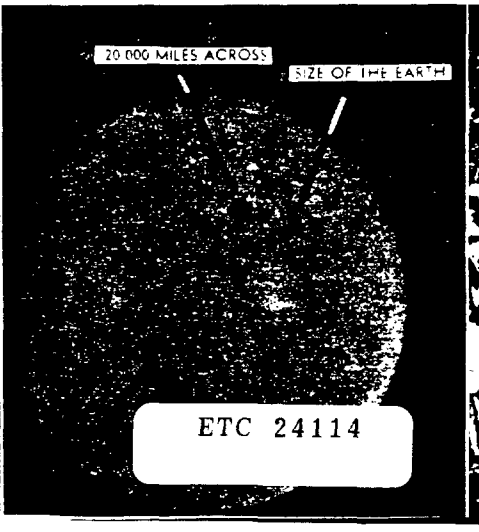
Cyclical Significance

The Foundation's main purpose is to act as a clearing house, to correlate the activities of those making studies, and to accumulate a library about cycles. A major aim for the future is to stimulate study to determine what if any significance there is between coincidental cyclical patterns.

For instance, building activity, the thickness of sedimentary rock strata, droughts, some sun-spot patterns, and financial recessions follow a rhythm of 18⅓ years. Is there any relation between any of them? Or might there be some significance in the fact that the death rate from heart disease in London and Paris for a given period was identical with the pattern of the ozone content in those two cities for the same period?

In any discussion of cycles, one

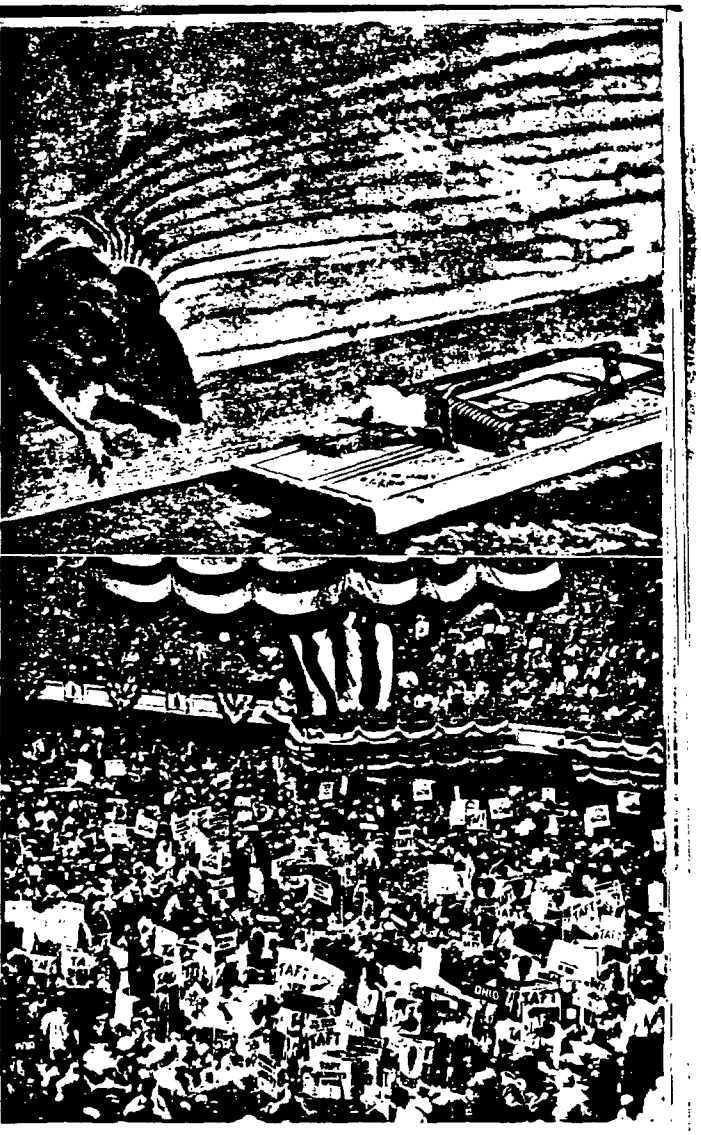
For some unexplainable reason building activities, certain sun spot patterns, and financial recessions follow a rhythm of 18⅓ years. Just as baffling is the fact that the thickness of sedimentary rock strata and droughts follow in exactly the same pattern. Scientists are seeking to learn if they are related



question is certain to present itself. If, for instance, you can chart stock market activity, why can't you go into the market and make a quick million?

The answer is that you can't make it quickly, and whether you can make a million depends upon how much money you have to work with. According to a study by Mr. Dewey, if you followed the pattern and had sufficient financing to ride over the variations, or irregularities, you would average a profit of about 15% to 20% annually.

The irregularities are caused by the fact that the pattern of stock market activities, like any other cycle, is not a rigid line. It is like a man with a bad heart climbing stairs. He goes predictably from the bottom to top, but stops to rest from time to time. A chart of his movement would not be a straight line, but rather cerrated. Also, the cycle may reach its peak or bottom a little sooner or a little later, or it may go a little above or fall somewhat short. Such things as war, while not affecting the underlying force of a cycle, may lengthen the peak, or an economic panic slightly deepen its descent.



The destinies of mice and men come under the mysterious whims of a four-year cycle. Presidential election years find the mouse population at its lowest ebb

Ocean Tide Cycles

One of the best illustrations of the basically unchanging force of a cycle is the ocean tides, which have a rhythm of twice in and twice out in every 25 hours. Should a hurricane come up as the tide is going out, the wind will carry the water in, but the force of the tide will continue outward even though it has no effect on the water. When the wind subsides, the pattern of the water's movement resumes at wherever the force of the tide's cycle is.

Some cycles seem completely impervious to extraneous influence.

Pig iron production, for instance, has followed its pattern downward even when there was a great war industries demand, and upward when the end of the war would be expected to curtail its production. Building in the United States has followed a rhythm of 18⅓ years regardless of conditions that might be expected to influence it. We are now on the downgrade of the building pattern, which, it is said, will reach its ebb in 1952, and there are students of cycles who will wager that no matter how urgent the need for housing and other building, that descent will continue until 1952.

This doesn't imply that we are helpless, that we can do no more than wring our hands when a pattern affects us adversely. It does mean that so far we haven't tried to do very much to understand or make use of cycles.

Where the attempt has been made, it has worked well. Some utilities companies, for instance, effect economies by planning their installations and operations according to the population cycles. Health authorities have been able to turn to advantage the knowledge that influenza and pneumonia have a three-year cycle, or that for the past 20 years a plague has hit Bombay at intervals of a year and four days.

It was Shakespeare who remarked that "there is a tide in the affairs of men." The cyclists hope eventually to prove that he spoke with as much scientific insight as poetic fancy.

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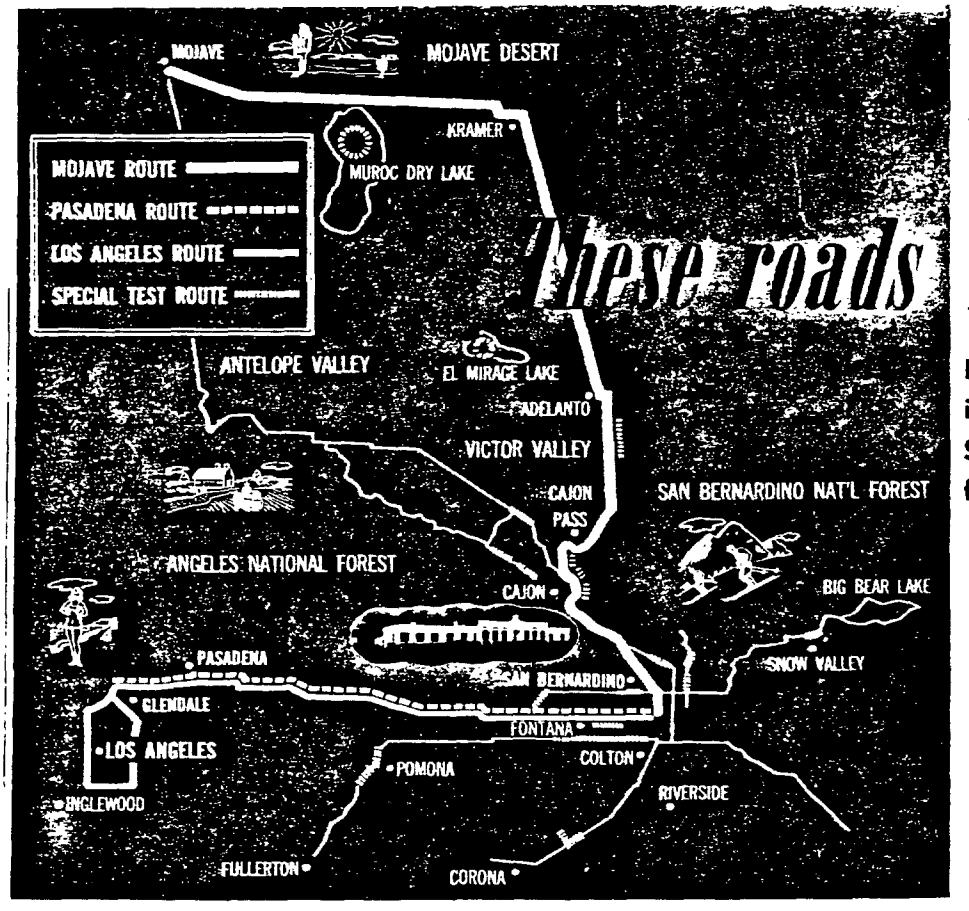

RATE

Providing, in effect, a U.S.A. in miniature, the highways of Southern California are ideal for testing fuels and engines

This map shows some of the test routes which Ethyl's engineers have charted for various determinations. In the inset is the Ethyl laboratory in San Bernardino

ONE OF THE miracles of the present-day automobile is that it can go any place in any kind of weather. Mountain or desert, level highway or rolling countryside, heat or cold, rain or shine – it makes no difference to the automobile. It will function as well on the flat, sun-baked roads of the Southwest as on the frosty, wind-blown highways of the Dakotas.

It is no mere coincidence that automobiles can automatically take any set of driving conditions in their stride. Automotive engineers and fuel technologists have brought about this happy situation through their never-ending studies of the behavior of engines and fuels on all kinds of terrain and in all sorts of weather.

The task of these engine-fuel specialists would be extremely difficult if they had to conduct their road research programs in the many scattered parts of the country where a single driving condition prevails. But no such map-jumping is necessary, thanks to the fact that a comparatively small section of Southern California is endowed with the duplicate of virtually every altitude, road gradient, and atmospheric temperature range to be found anywhere in the United States.

San Bernardino the Center

Hub of this "U. S. in miniature," which engine-fuel specialists recognize as unexcelled, is the warm city of San Bernardino. From it radiate, like the spokes of a wheel, highways, that, in effect, put you astride a stretch of barren Texas pavement, high atop a Virginia mountain range, on an up-hill-down-dale Vermont road, or in the chilly atmosphere of the Rockies. Even many streets of San Bernardino itself are unusually suited for road research activity, and are often used for that purpose.

As a pioneer in road research, Ethyl Corporation realized the value of San Bernardino as a base of operations as long ago as 1935.

It was then seeking a locale for a road research laboratory that would be of year-round usefulness in augmenting the road testing programs of the Company's central research laboratories in Detroit. Several states in the lower left-hand corner of the country were explored, but no area measured up to San Bernardino as a natural proving ground. Finally, after much preparation, a group of Ethyl engineers and test drivers set out for San Bernardino from Detroit, with their apparatus and equipment loaded aboard four huge truck-tractors and semi-trailers.

Upon their arrival, the Ethyl men set up shop in a converted automobile showroom and garage. This was

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Ethyl's first San Bernardino laboratory. Three years later, the present modern building was constructed, which serves as the headquarters for its road test programs.

Since 1935, Ethyl has conducted thousands of tests out of San Bernardino in keeping with its desire to contribute to engine-fuel compatability. Over and above the Corporation's own projects, however, the California facility has served as headquarters for several noteworthy cooperative test programs of varying scope and interest.

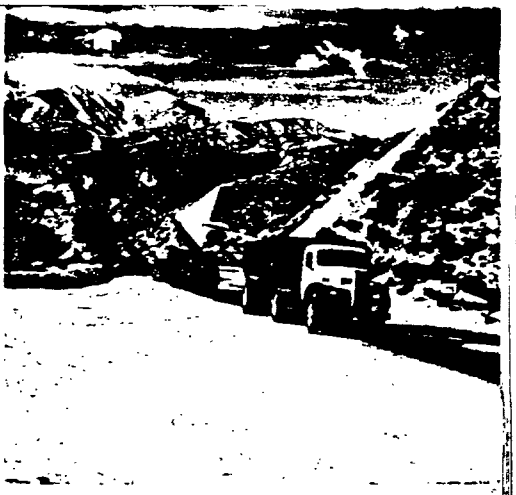
The first such test was conducted less than a year after the laboratory had been founded. The aim was to establish what effect, if any, atmospheric conditions had on the road octane rating of motor fuels. There was a dearth of such material at the time.

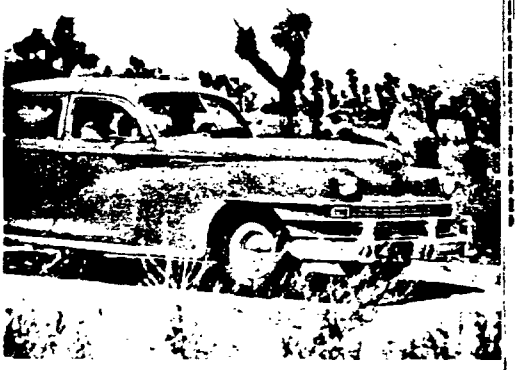
Twenty-one late model cars and 35 test fuels, chosen to cover most of the base stocks and then current refining methods, were employed in the program. The test course was laid out on one of the streets of San Bernardino. Nearby a small-scale weather station was constructed according to U. S. Weather Bureau specifications, enabling the test crews to have pertinent weather information at hand at all times.

Many of the tests were run on both sides of the clock in order to take advantage of Southern California's wide difference in day and night temperatures. In that way it was possible to make direct comparisons of fuels in the same cars under conditions that were identical except for atmospheric temperature. Later in the year, the scene shifted to Tulsa, Oklahoma, for tests up to 117 degrees, and to the General Motors Proving Ground, near Detroit, where near-zero winter temperatures are common.

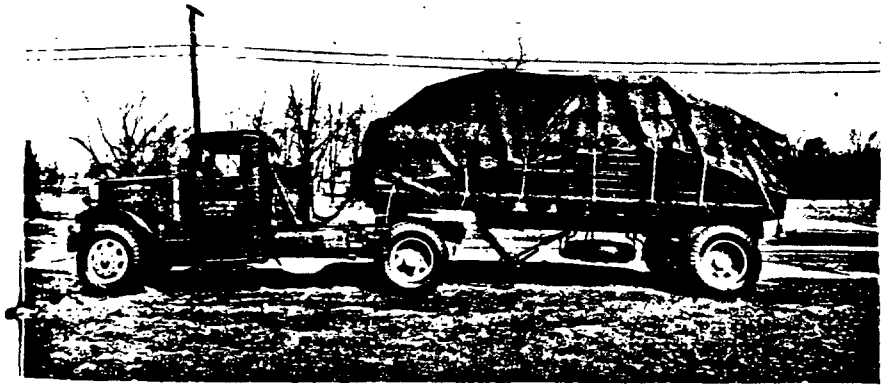
The data obtained in the San Bernardino tests were made available to the Cooperative Fuel Research Committee (CFR) for use in its constant attack on the problem of correlating laboratory knock testing data with the actual performance of cars on the road.

Another of the more significant cooperative tests that have been





Topography available for road research around San Bernardino ranges from snow-capped mountains to blistering deserts



Above, this truck-trailer carrying two test tractors was part of the original Ethyl caravan to San Bernardino. . . Below, this former auto showroom was the first Ethyl lab

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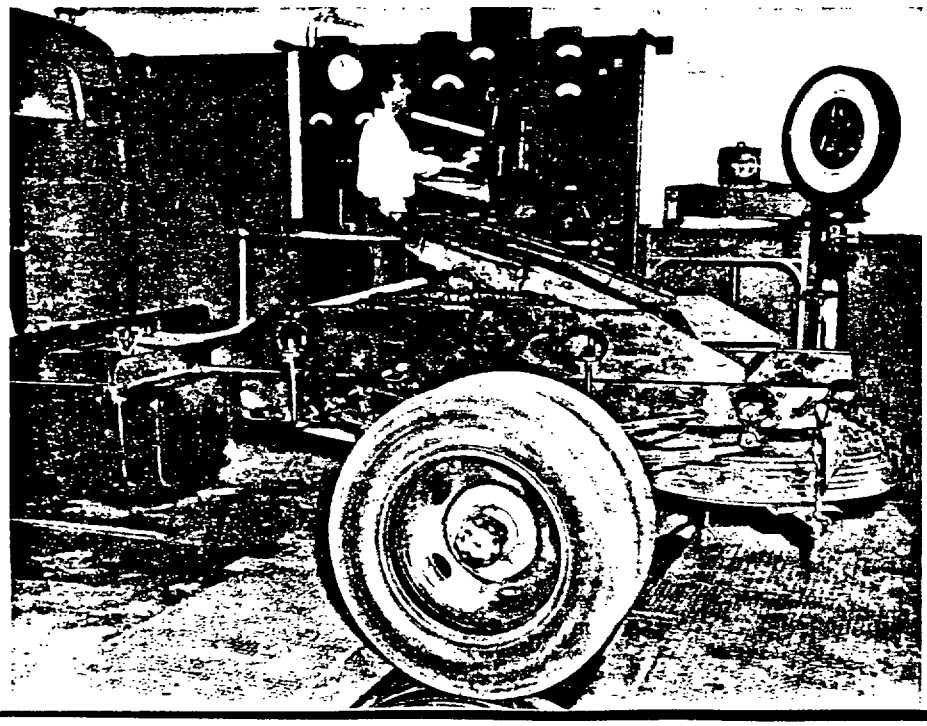
Above, some of the units in the test fleet at Ethyl's laboratory in San Bernardino. Commercial vehicles as well as passenger cars are used in the year-round road tests

Ethyl's gasoline testing laboratory is among the facilities available at San Bernardino for research purposes. . . .

Below, chassis dynamometer tests at the laboratory supplement the road research programs on fuels and engines

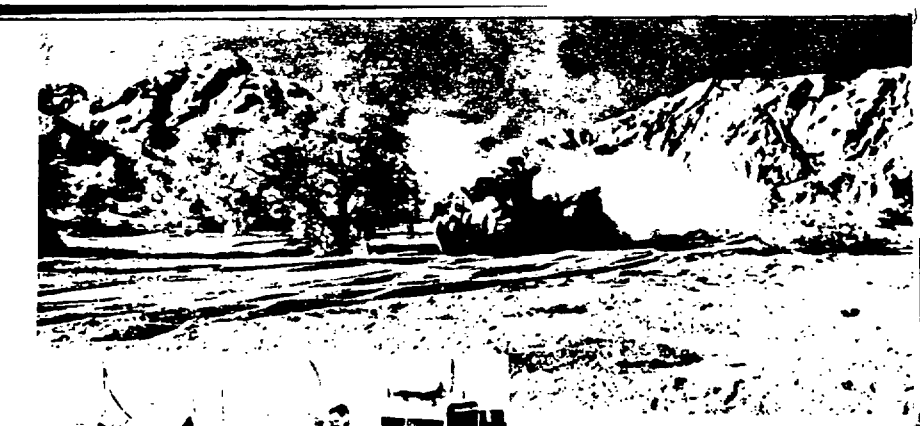


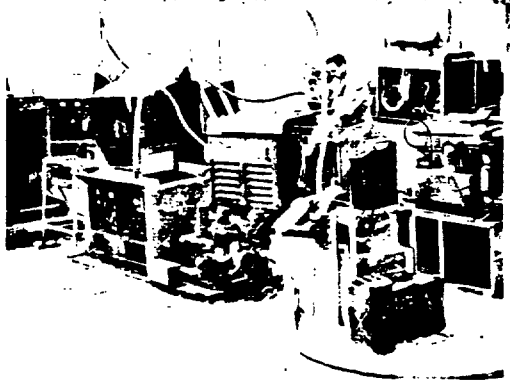
conducted with the Ethyl laboratory in San Bernardino as the center of activities was the Centralized Road Tests sponsored by the Motor Fuels Division of the CFR from October 8 to November 15, 1940. The 33 participating organizations included oil companies, automobile makers, engine and carburetor manufacturers, the National Bureau of Standards, the Society of Automotive Engineers, the Ordnance Department of the U. S. Army, and Yale University.

Increased Fund of Knowledge

The five weeks of intensive fuel investigation, the formal report of the CFR noted, contributed "considerable progress . . . toward the development and acceptance of new techniques and new concepts relating to the detonation problem." One tangible result was formal acceptance by the CRC (Coordinating Research Council) of the Borderline method of road knock rating. This procedure, developed by two oil companies, was first published in 1937. It serves as an adjunct to the Uniontown road test method, previously adopted, as a means of evaluating the knocking tendency of a fuel over a vehicle's entire speed range.

During the war, the Ethyl facilities at San Bernardino served as general headquarters for three programs of vital importance to the armed forces. All were sponsored by





Above, this tank took part in the two-year studies of vapor-locking characteristics of Ordnance equipment conducted by CRC personnel. . . . Left, some of the 33 Ordnance stationary engines used in another wartime project

the CRC, two at the request of the Ordnance Department and the third at the request of both Ordnance and the Army Air Forces.

One project was a two-year investigation of the vapor-locking characteristics of Ordnance transport and combat vehicles, ranging from the jeep to mammoth tanks and gun carriers. The actual studies were carried on at Camps Young and Seeley, in the Southern California desert region, using equipment of two armored divisions which were being readied for the invasion of North Africa. During the tests, more than a thousand fuel samples were inspected and analyzed at Ethyl's gasoline testing laboratory in San Bernardino, one of five such service facilities maintained by the Corporation across the nation.

Armored combat vehicles, it is well known, possessed inherent cooling and ventilation handicaps that made the assignment of protecting them from vapor lock far from simple. Nevertheless, the test personnel, which CRC had assembled from oil and automotive companies, were able to develop fuel system fixes which permitted satisfactory operation under abnormally severe vapor locking conditions.

The second wartime project was designed to compile gum tolerance data on fuels for possible emergency use in mobile Ordnance equipment and auxiliary stationary engines. The vehicle tests were run at Camp Bullis and Normoyle Field, Texas, in 1944 and 1945. The stationary engine phase was conducted in the backyard of the Ethyl laboratory in San Bernardino from August 9 to September 9, 1945. Thirty-three engines of six different types were operated continuously for 500 hours, or until they failed mechanically, whichever came first.

The findings of the vehicle and auxiliary engine tests were studied and analyzed for the Army by the CRC, and definite recommendations were made concerning the maximum gum which Army fuels could contain and still be used safely in emergencies.

Desert Storage Program

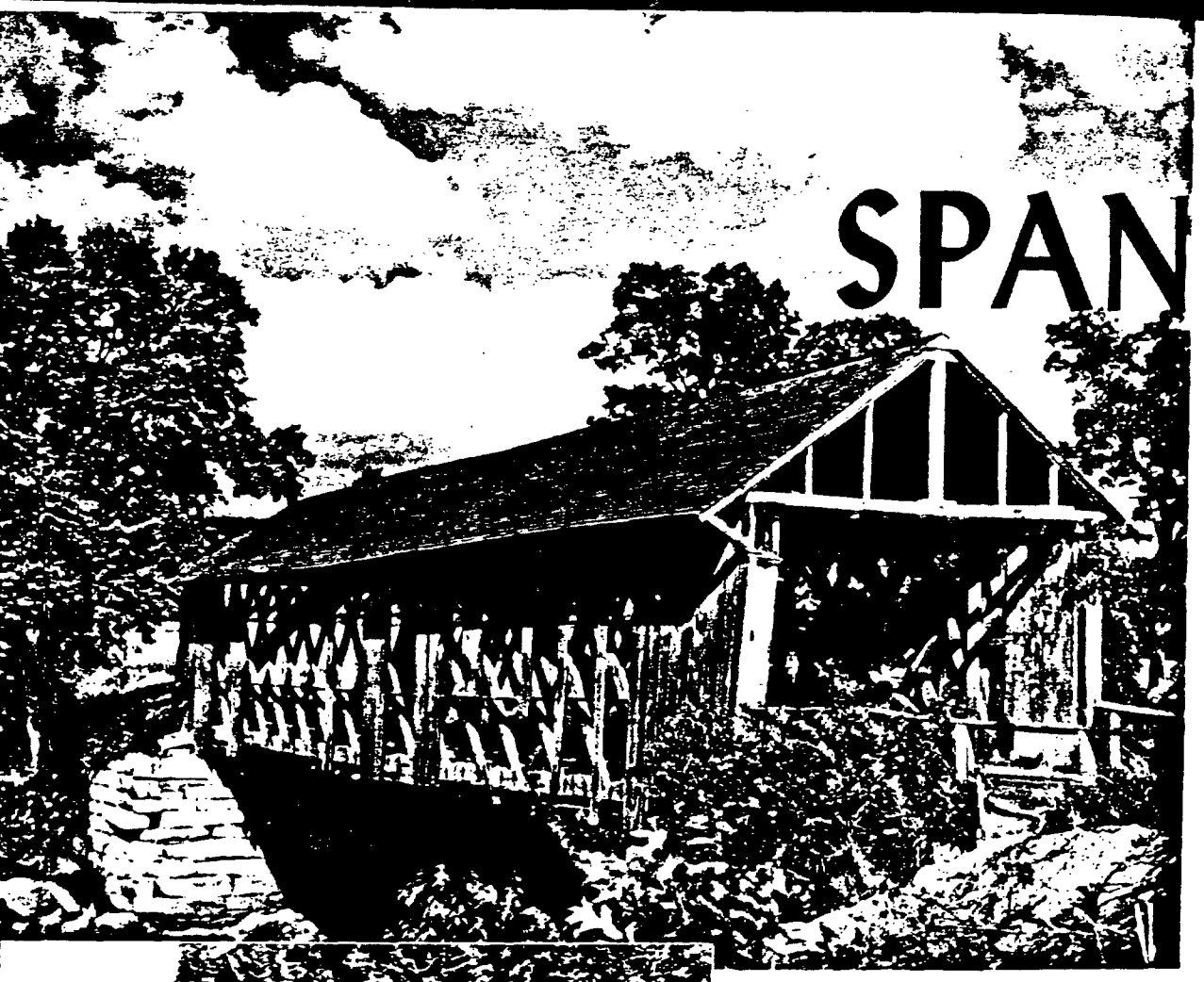
The third cooperative undertaking which made use of the San Bernardino laboratory during the recent war was the Desert Storage program conducted by the CRC Gasoline Additives Group in cooperation with several oil companies. Hundreds of drums and blitz cans of motor and aviation fuel were placed in the broiling sun of Southern California for long periods to determine the storage stability characteristics of each type of fuel. The Ethyl laboratory served as the receiving point for test gasolines shipped in from all parts of the country, and then blended the fuels with various additives.

In addition to the cooperative programs, the San Bernardino laboratory often is used by Ethyl's customer oil companies for tests concerned with their own products. Too, a truck and bus manufacturer recently used the laboratory as a headquarters for extensive road and chassis dynamometer studies of its new engines.

At the disposal of groups interested in engine-fuel progress are the equipment of the road research laboratory and the gasoline testing laboratory, which is housed in the same building. Also available are 30 different test routes which Ethyl engineers have carefully charted for various determinations. These routes, part of state and national highways, vary in length from 1,663 feet for spot performance checks to 214 miles for tests concerned with durability and endurance. In altitude, they range from sea level to 7,000 feet.

Since 1935, these highways have yielded more than six million valuable test miles to Ethyl vehicles alone. All in all, since Ethyl instituted road testing 23 years ago at the Company's original research laboratory in Yonkers, New York, its vehicles and those of cooperative test fleets have traveled about 47 million miles or 1,880 times around the world at the equator.

SPAN



Missing sheathing from this old-timer near Short Falls, N. H., shows an interesting pattern of supporting beams

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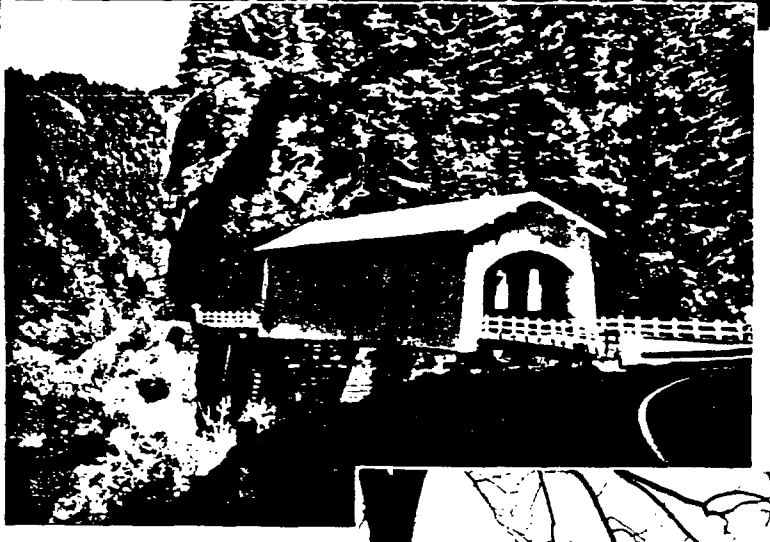
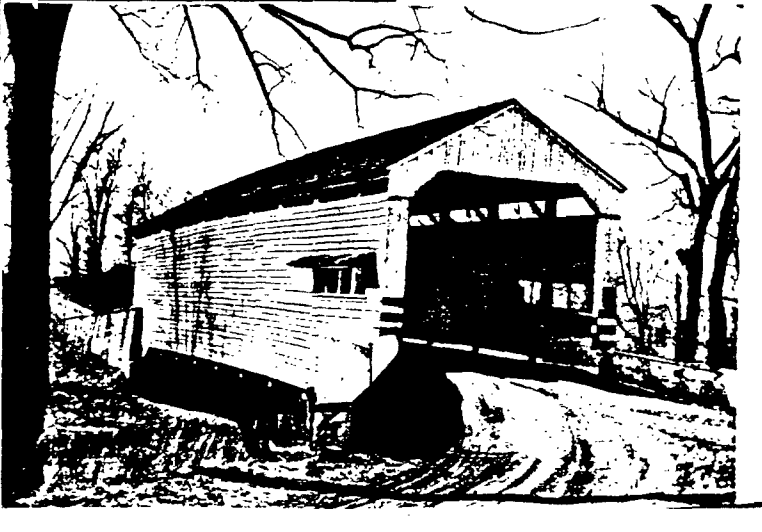


Pennsylvania still has nearly 250 old covered bridges like the one below, over the Chickies River in Lancaster County



A bridge crossing Mill Creek, above, in Douglas County, Ore., suggests the classic lines of an old Colonial church

NING THE YEARS

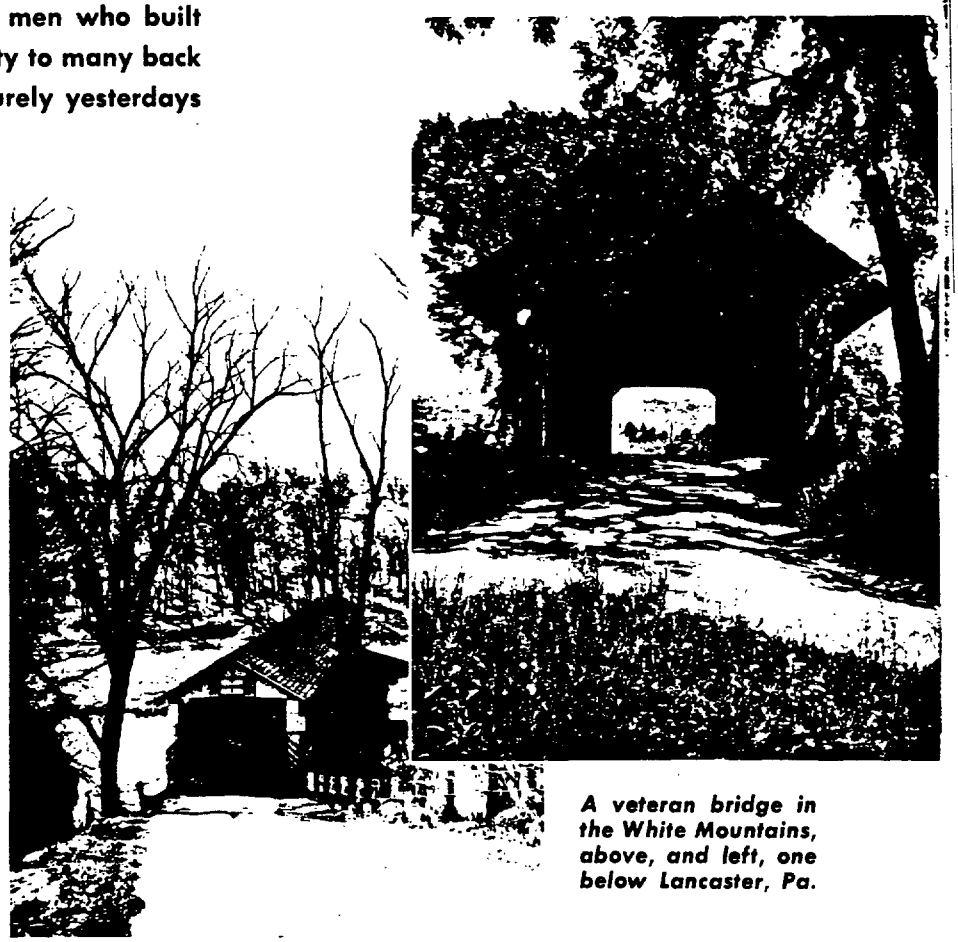
Covered bridges, sturdy as the men who built them, still lend charm and beauty to many back roads, reminding us of our leisurely yesterdays

By Lawrence McCracken

IN ALL the category of sound, there's no other quite like the cloppity-clop of horses' hooves echoing through the cool darkness of a covered bridge.

That nostalgic melody may be seldom heard today, yet the covered bridge survives in surprising numbers on our secondary highways. A casual survey reveals that some 1,668 remain in use in 13 states alone.

The first covered bridge spanned the Connecticut River at Bellows Falls to link Vermont and New Hampshire in 1785. Few if any have been constructed since California built one in 1935. But thanks to oaken beams, and protection from the elements afforded by the cover, some of these veterans may be on the scene when another century rolls around.



A veteran bridge in the White Mountains, above, and left, one below Lancaster, Pa.

Solid construction gives these bridges a long life. At least four generations have used this span near Jackson, N. H.

Sometimes early designers added extra conveniences. The one at Ashuelot, N. H., below, has a covered pedestrians' walk

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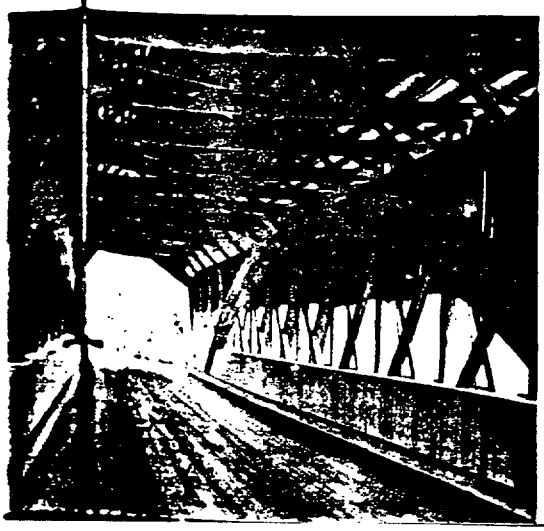

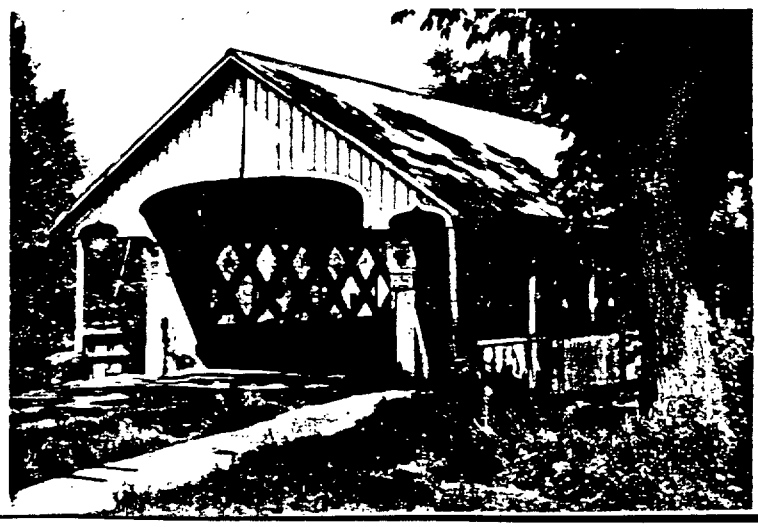

William B Adams
Secy is
Linda Boatz

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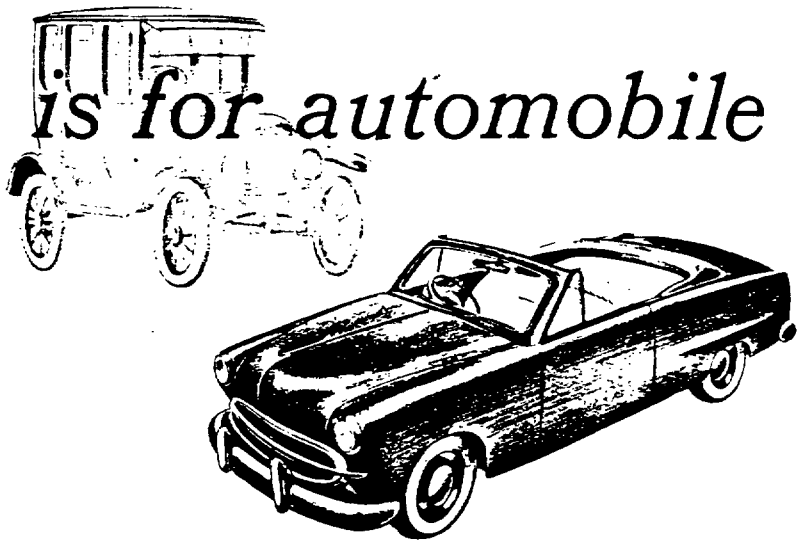
A is for automobile



We don't talk the same language we did a few decades ago, when it comes to describing an automobile and its parts

TIME WAS WHEN the automobile owner was his own mechanic. Repairmen were not nearly as legion as they are now, so the best insurance against a breakdown was to tinker with the family car yourself.

This resulted in an intimate knowledge of all that went to make up the car of yore. Motorists knew the name of every part and accessory, knew where each was located and how it worked, and – likely as not – knew how to fix it. The *radiator temperature gauge* was no mystery to anyone. Everybody recognized a *splash apron* when he saw one. And a hundred and one other items.

Today these terms – as well as the physical parts and accessories they described – all but rest in that Valhalla of nostalgia where repose the Haynes, the Locomobile, and countless other well-remembered gasoline buggies of days gone by. The modern motorist tosses about instead such relatively new expressions as *knee action*, *torque converter*, and *octane selector* – and does it almost as if he knew what it was all about.

But let's face it. The average motorist merely pays lip service to these words. Probably not more than five in a hundred laymen can give out in understandable detail about these and the other major automotive achievements of the past two decades. The reason is simple. With the automobile such an efficient and dependable machine, and with repairmen always handy in case anything does go wrong, we don't have to keep up on these things like our forbears did.

What these fairly recent developments do point up, however, is that we just don't speak the same "car language" we did even 15 or 20 years ago. Automobiles have changed drastically, and so has the motorist's vocabulary.

All of us know or have heard how it was in the yesteryear.

Great Preparations

To start the car, the motorist went through a prescribed ritual that had to be performed just right if it was to work. First he set the *spark* on the steering wheel, pulled out the *choke*, and turned to the business of *cranking*. If he was lucky, the engine soon caught on and was running smoothly.

Just before taking off on a trip, the driver would take a passing punch at the spare tire carried in the *fender well* or on the *tire rack* at the rear of the car. This was to make sure that the spare had enough air in it, if he should have to change a flat tire on the road. Also, if he was duly conscientious, he made sure the *tire pump* and *blowout patches* were as and where they should be. In the catch-all *door pockets* were stored such essentials as road maps, extra sets of keys, and perhaps a few sandwiches and a thermos of drinking water. Should the day be hot, the *swinging windshield* was pushed open. This not only let in the cool breezes, but it was also considered quite sporting, giving a rakish appearance to the car.

But talk of such things to the present generation and you'll get nothing but blank stares. We just don't have such things nowadays.

Modern automobiles are too utilitarian to be considered mere pleasure cars, as formerly. The spark is under the hood and its setting is automatic. Hand cranks gave way long ago to the electric self-starter. Spare tires are neatly hidden from sight in the trunk of the car, and most of our *balloon* and *super-balloon tires* have never felt the kiss of a hand pump.

It's too easy to inflate them at the service station, and besides modern tubes retain the air far longer than did the "inners" of years ago. Door pockets figuratively went out the window. And the swinging windshield has swung right out of existence in favor of *panoramic windshields* that offer far greater vision. Proper car ventilation, of course, is provided for scientifically these days and is not dependent upon a movable windshield.

Some automotive expressions have faded out of the picture only to reappear years later.

Low Center of Gravity

Take *low center of gravity*, for instance. As long ago as 1931, at least, one automotive manufacturer was emphasizing that his product possessed this hug-the-road characteristic. Low center of gravity then vanished from the scene – from an advertising and sales promotion standpoint, anyhow – only to come back in the post-war era as one of the desired safety features of the new models.

Too, many terms which seem to drop from sight actually only change their spots. What grandfather knew as *chain tire grips* we call simply *chains*. The erstwhile *package compartment* has become the *glove compartment*. *Parking lamps* still serve the same purpose, but, bowing to the times, they are now *parking lights*. The former *filling station* and *gas station* have given way to *service station* in recognition that the gasoline dealer performs services far beyond that of merely pumping motor fuel into your car.

New Terms for Old

But, by and large, when the motorist's vocabulary undergoes the knife, the surgery is permanent.

Right now, with radiators snugly secreted behind front end streamlining, it's rather difficult to conceive that *radiator shutters* and *radiator shields* ever again will come into vogue. Fenders or mudguards, as once we knew them, no longer exist on the newer models, due to the *pontoon* and *bustle back* styling of today. The *clutch* will in time fade into limbo, if the present trend toward automatic transmissions continues. Even car model names are not left unaffected by the passing of time. *Victorias*, *runabouts*, *broughams*, and *phaetons* have yielded to the more compact *business coupes*, *club coupes*, *sedans*, and *convertibles*.

But as descriptive terms vanish from the motorist's glossary, new ones are right there to take their place. Some are practically self-explanatory; others are not so easy.

Even if you didn't know for sure, it wouldn't take more than a lucky guess to say what and where a *club seat*, *safety rim wheel*, and *sealed beam headlight* are. Almost everyone, too, can define *turret top* as the car's all-steel, one-piece roof; *butterfly window* as that quarter pane which operates independently of the main front seat windows to aid in ventilation; and *fender skirt* as the new decorative covering which makes the car seem as if it is riding on a half wheel and half tire.

Because he automatically associates octane with gasoline, the average motorist will correctly reason that the octane selector has something to do with the fuel his car uses. Through the years, it has gone by many aliases, such as *gaselector*, *octane tuner*, *distributor adjuster*, and *distributor locking plate*. But, by any name, the octane selector remains the device by which the engine spark setting can be properly adjusted to take full advantage of contemporary motor fuels.

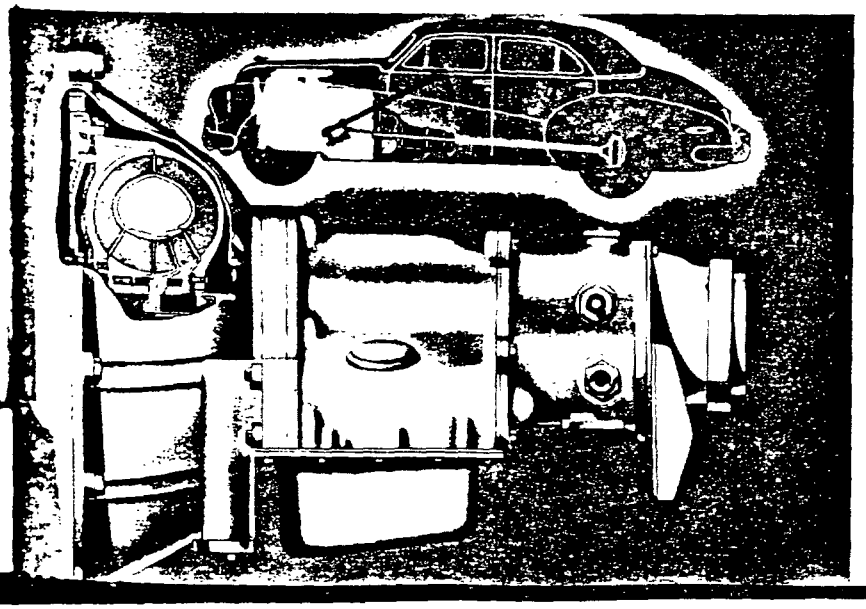
Another teaser is *overdrive*. This entered our motoring lives and our automobile dictionary in the mid-thirties. Shorn of its technical nomenclature, overdrive simply is a fourth forward speed, which reduces engine speed for a given road speed and thereby makes for greater fuel economy.

Terms Mirror Improvements

In a very real sense, the changing automotive terminology chronicles the major engineering achievements through the years.

Synchro-mesh, *fluid coupling*, *automatic transmission*, *torque converter* – all are terms that have come into being as a result. He may not know the engineering principles in-

One of the newer developments motorists are becoming familiar with is the torque converter, shown below



volved, but to Joe Driver each word spells progress and means easier, surer handling of his car.

It was about 25 years ago when we added synchro-mesh to our car vocabulary. While synchro-mesh removed some of the burden of the gear-shifting operation, it was offered mainly as a silencing feature to steady the nerves of drivers who ground their teeth whenever their old transmissions ground their gears.

Having applied the quietus to gear-shifting, engineers began to devote their attention to the development of modern completely automatic transmission systems. Principles which had long been known, and indeed had been employed in some of the very early automobiles, were brought into play. There were several milestones along the way – but the most important was probably the fluid coupling type of transmission that first made its bow some eleven years ago. This system still required a clutch, but the driver didn't have to use it as often as on earlier types of transmissions.

What about these words "fully automatic transmission" and "torque converter" that have crept into the layman's vocabulary in recent years?

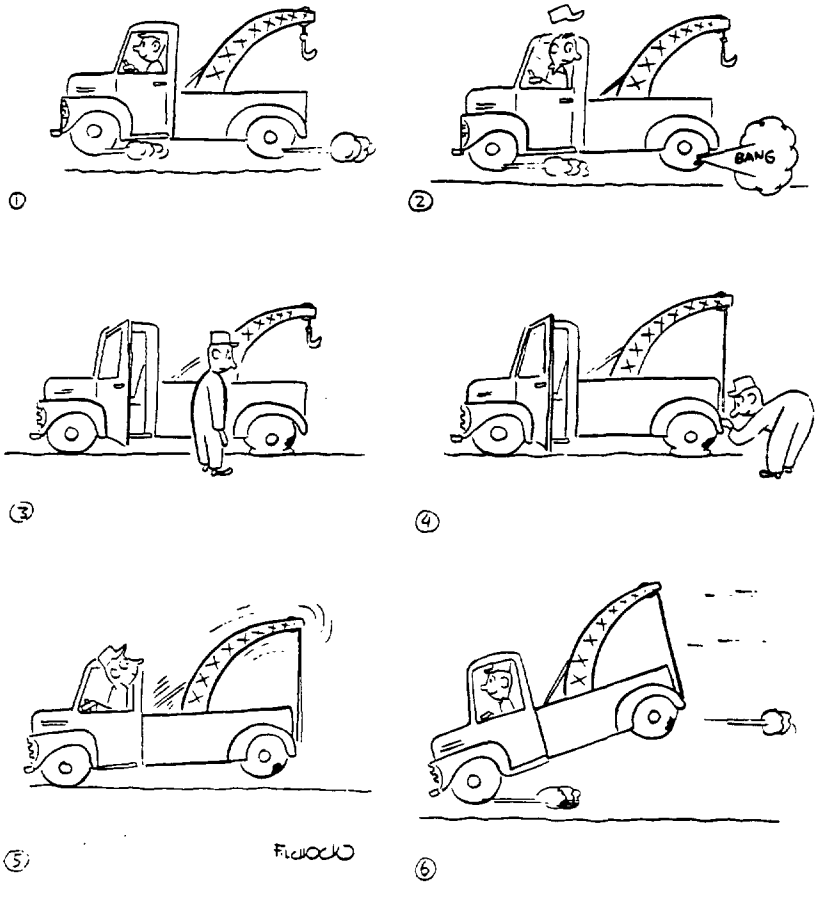
Both are automatic devices which provide variable power ratios. Both utilize a fluid coupling, which serves to cushion the flow of power.

One type of fully automatic transmission found on some cars today is a combination of fluid coupling and a four-speed planetary gear drive. The gear ratios are automatically selected by the amount of throttle the driver is using, without any interruption in acceleration.

The torque converter type, on the other hand, is a combination of a torque converter and a fluid coupling, in conjunction with a planetary gear set. It multiplies the engine's torque, or twist, through the spinning action of oil in a smooth, infinitely variable fashion. It differs from other automatic transmissions in that it does not shift from one gear range to another, but offers instead an infinitely variable range of power and speed through a hydraulic torque converter.

Neither type of transmission – fully automatic or torque converter – requires the conventional foot-operated clutch, of course. And a special shift bar replaces the normal gearshift lever.

In addition to these, other variations of automatic transmissions are to be found on some late model cars.



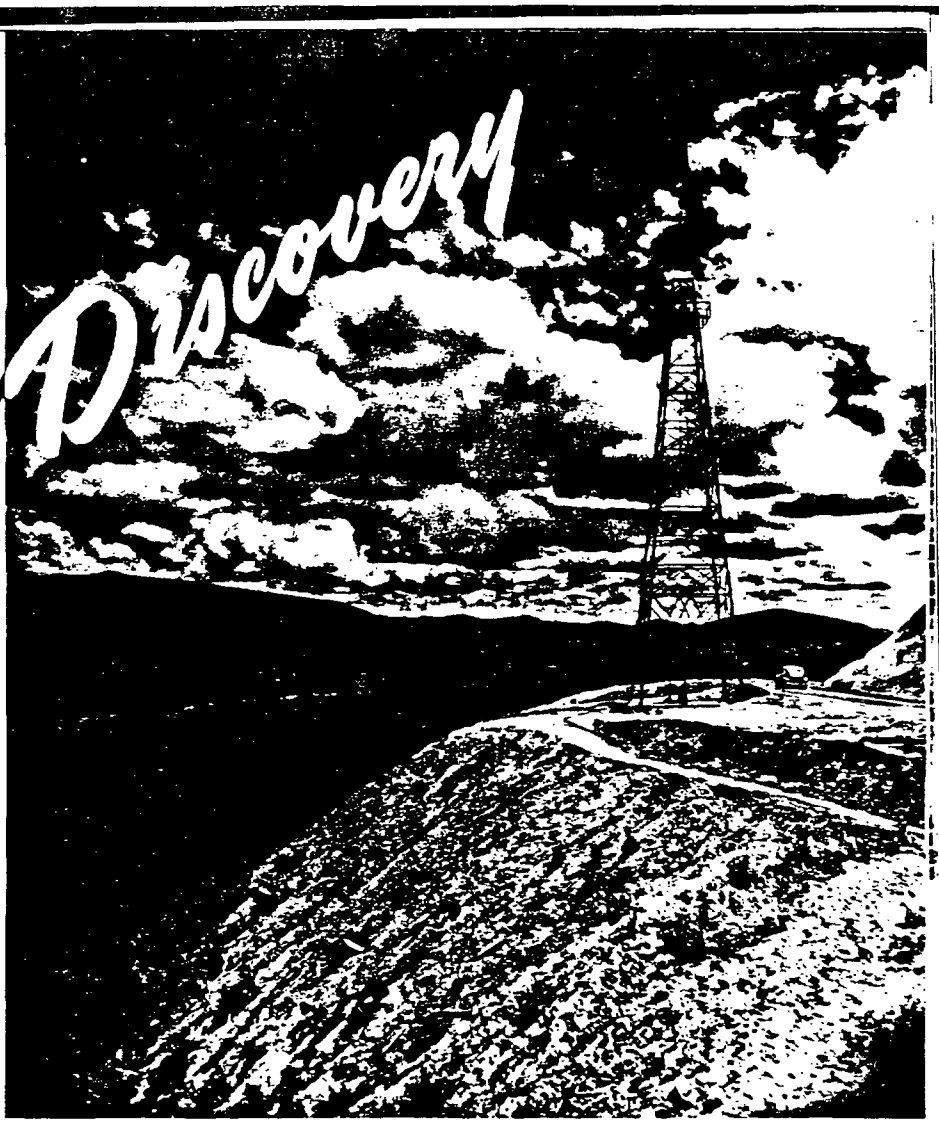
Changing from the Start

And so it is. As automotive engineering and styling progresses year after year, new words worm their way into our everyday speech. From the very start, the motorist's glossary has been an ever-changing one. Even the automobile pioneers themselves had trouble keeping abreast of the times in this respect.

When the self-propelled vehicle was born, there was great to-do about what to christen the new baby. It was obviously an *autocycle*, some maintained. Others argued in favor of *petrocar* or *buggyaut*. *Motocycle* and *motor wagon* were not without their supporters. Plain old *gasoline buggy* and *horseless carriage* were good enough for most people.

Somewhere along the line there was agreement on the French term: *automobile*. After half a century on the scene, it's a pretty safe bet that the automobile – machine and term – are here to stay.

Peaks of Discovery



The Rocky Mountains, long known as a vast storehouse of natural resources, are now emerging as an important new reservoir of petroleum

By Thom Yates

WHEN NATURE HANDED out her resources, she was especially generous to the Rocky Mountain area. Beneath this region of topographical contrasts lie some of the world's richest endowments of underground wealth. In varying amount, there is on deposit in the great natural Bank of the Rockies organic and inorganic materials which run the gamut from agate to zinc. Near the middle of the alphabetical listing, but ranking much higher in all its possibilities, is petroleum.

Potentially, oil is to the Rocky Mountain states what lumber is to the Pacific Northwest and cotton is to the South. Even today, when the oil fields are still in their early development stages, petroleum is an important economic factor. In Wyoming, for instance, one of every five persons had a job in the oil industry in 1948, and they accounted for more than one-fourth of all wages paid in that state.

Of Growing Importance

Activity in the region during the past seven years has proved conclusively that the Rockies consist of a vast new crude petroleum reserve. Just how vast, no one yet knows. Observers say it will be another ten years or more before the petroleum deposits can be estimated with any real degree of accuracy. One of the few solid facts at the moment is that Colorado, Wyoming, and Montana contain five of the 130 oil fields in the United States which have an estimated ultimate production of 100 million barrels or more each. The total crude oil reserves of these three states are now estimated at approximately 1.2 billion barrels.

Scores of oil companies are actively engaged in exploring for and bringing out the oil which lies hidden under the rugged mountains, the picturesque buttes, and the sweeping plains that make up the Rocky Mountain region. It is an activity that extends from border to border and well into Canada. For, in addition to Colorado, Utah, Wyoming and Montana, many show Arizona, New Mexico, Idaho, and the western part of the Dakotas on their

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Rocky Mountain oil maps. Some geologists believe that the oil-rich province of Alberta also should be considered a part of the over-all Rockies operation.

All up and down and across the broad expanse of these states – but chiefly in Wyoming – the industry has been finding and producing oil in ever-increasing quantity since the current spirited activity began during the recent war.

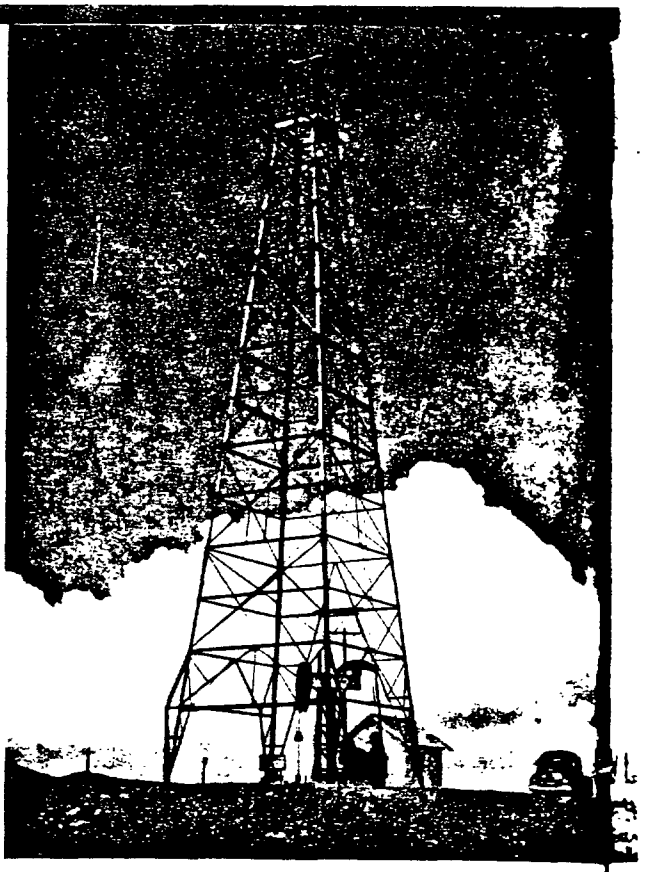
New Records Set

Last year, a record 82 million barrels of crude were siphoned from subterranean Colorado, Wyoming, and Montana. That was an increase of 37 million barrels over 1944 production, although it of course represented only a modest 4% of the total national crude production. However, the story of the Rockies is not yet one of production or proved reserves, but rather of the effort to develop this potentially great reservoir of oil.

In the Rockies, man has drilled deeper and built wells and pipelines higher than the world has ever known before.

A Superior Oil Company of California wildcat in Sublette County, southwestern Wyoming, reached the 20,267-foot mark early in June and was still going down. That is more than 5,900 feet deeper than the world's deepest producer, a Pure Oil Company well in the West Poison Spider field near Casper, Wyoming. At the other extreme, The Texas Company has wells in the Wilson Creek field of northwestern Colorado that began drilling at more than 8,000 feet above sea level. Rangely also boasts the highest major pipeline – a 10-inch line that transports crude to a Salt Lake City refinery, 182 miles away. The line is operated by the Salt Lake Pipe Line Company, a subsidiary of Standard Oil Company of California. Completed last Fall, it reaches an elevation of 9,560 feet at one point of its journey out of Rangely and across Utah.

Rangely and Elk Basin, the latter along the Wyoming - Montana boundary, are the foremost names in today's Rocky Mountain activity. Both fields had been known for years – Rangely since 1902 and Elk Basin since 1915 – but their full development did not come until the recent war.



Highest well in the U. S. is this Texas Co. unit in Wilson Creek, Colo. Base of its derrick is 8,378 feet above sea level

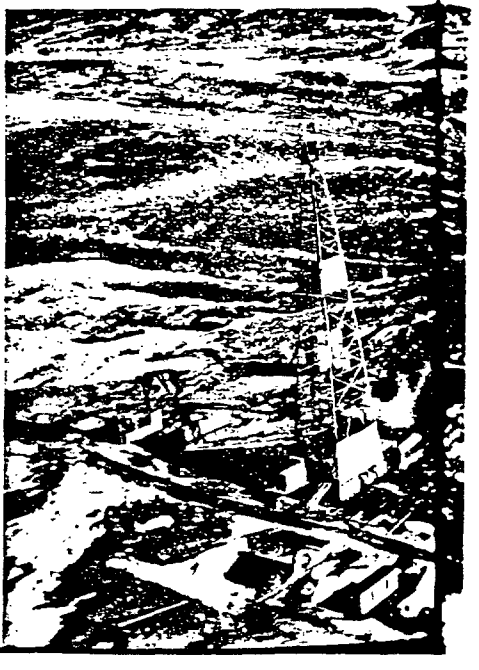
Leading Fields in the Region

Between them, Rangely and Elk Basin last year produced 21.5 million barrels of crude, or roughly 25% of the entire output of Colorado, Wyoming, and Montana. The Rockies' No. 3 field last year was Salt Creek, in eastern Wyoming. This historic field, which once was one of the world's largest producers, is without peers among Rocky Mountain pools in cumulative production and until a few years ago gave forth a yearly output second only to Rangely. Salt Creek's production last year was 4.6 million barrels. The other major producers were Oregon Basin, with 3.75 million barrels, and Lance Creek, with 3.3 million. Both these fields are in Wyoming.

Among the Rocky Mountain states, Wyoming led the way with a crude output of nearly 56 million barrels. This was more than twice the combined production of Colorado and Montana, and it put Wyoming in seventh place among the nation's oil-producing states.

Reflecting the intensified exploration and development program, Wyoming last year added over 21 million barrels of oil to its esti-

Deepest producing well is Pure Oil's West Poison Spider No. 1



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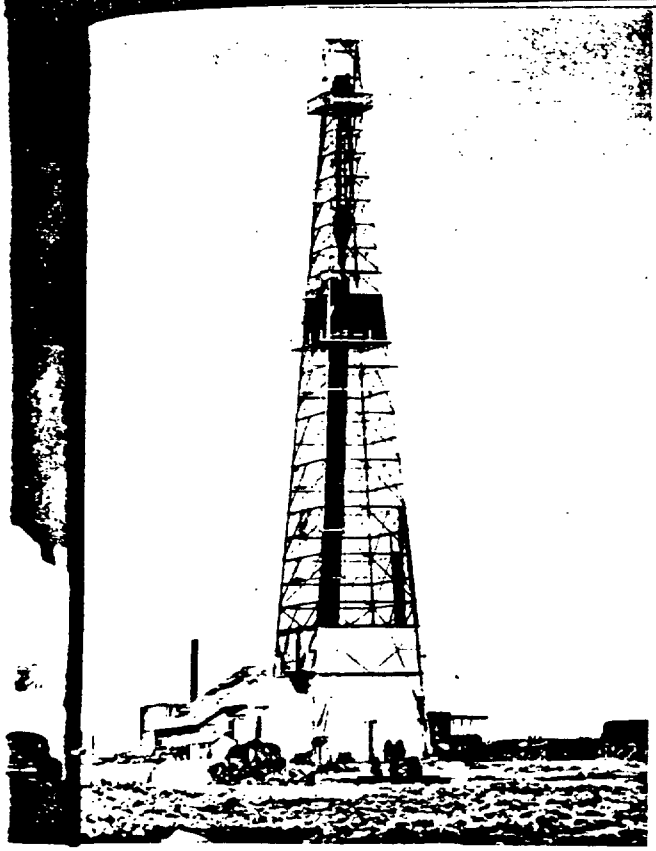
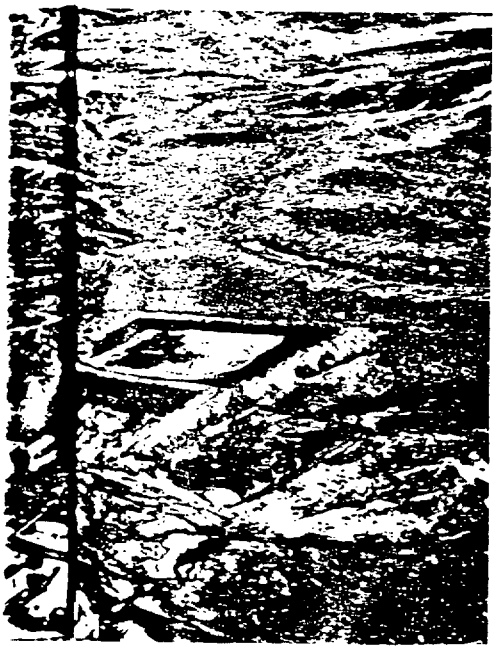


Deepest well being drilled is Superior Oil's Pacific Creek No. 1, Sublette County, Wyo., which has passed 20,200 feet

mated proved reserves through new discoveries alone, and was eighth among the states responsible for the increase in the nation's proved oil reserves. Among the other Rocky Mountain states, Montana accounted for 1.5 million barrels in new discoveries and Colorado for 350,000 barrels.

The well, in Natrona County, Wyo., is 14,309 feet in depth



A single discovery was made in Utah last year. But it was of considerable significance because it was the state's first commercial oil well. Equity Oil Company made the strike in the Ashley Valley field of northeastern Utah. Carter Oil Company and several other operators are also active in this, the Utah portion of the Uintah Basin, and it is estimated that more than two million acres of the Basin are under lease.

Colorado Discovery

Colorado's lone discovery of 1948 also is attracting attention, and may prove to be the scene of some of the most intensive development in the Rockies this year. The locale of the well is the so-called Four Corners Area where Arizona, New Mexico, Colorado, and Utah join boundaries. Interest in this region was intensified last Thanksgiving Day when a distillate-gas well was brought in amid prophecies that it may open up a field of substantial proportions. If the predictions come true, this will be Colorado's first major field since Rangely.

Montana also expects increased activity as the result of four discoveries in the central part of that state last year. These new fields – bearing the colorful names of Ragged Point, Big Wall, Melstone, and Woman's Pocket – are in an area that embraces more than three million acres. The Texas Company, Amerada Petroleum Corporation, Continental Oil Company, and Gulf Oil Corporation are among the major leaseholders. Other companies – including Hunt Oil, Phillips Petroleum, Carter, and Shell Oil – retain extensive blocks in other parts of the state which also give promise of becoming producing areas.

Idaho Another Possibility

Idaho is not yet an oil state, but forecasts are that it may soon join the ranks of producers. Some wildcat drilling may get under way this year in scattered parts of the state. Oil is believed to exist in north-central Idaho and in the eastern and southwestern sections of the state.

Wyoming completely dominates oil exploration, drilling, and processing in the Rockies. There is activity of one degree or another in all 23 of the state's counties. The bulk of it this year will, of course, be centered in Wyoming's four major producing basins – the Powder River, the Wind River, the Green River, and the Big Horn. Too, there may be wildcatting in the southeastern corner of the state, which thus far has produced little of the 807 million barrels of petroleum that have been taken out of Wyoming since the state's first oil was found 65 years ago. A recent discovery near Cheyenne in the Denver Basin resulted in some leasing activity with prospects of wildcatting.

Meanwhile, as the search for oil goes on, new facilities for processing the crude are being built and many existing refineries are being expanded. One hundred million dollars are being spent on refinery expansion in the Casper area alone. As part of this, Socony-Vacuum, Standard of Indiana, and The Texas Company have installed, or are erecting, new units that will raise the com-

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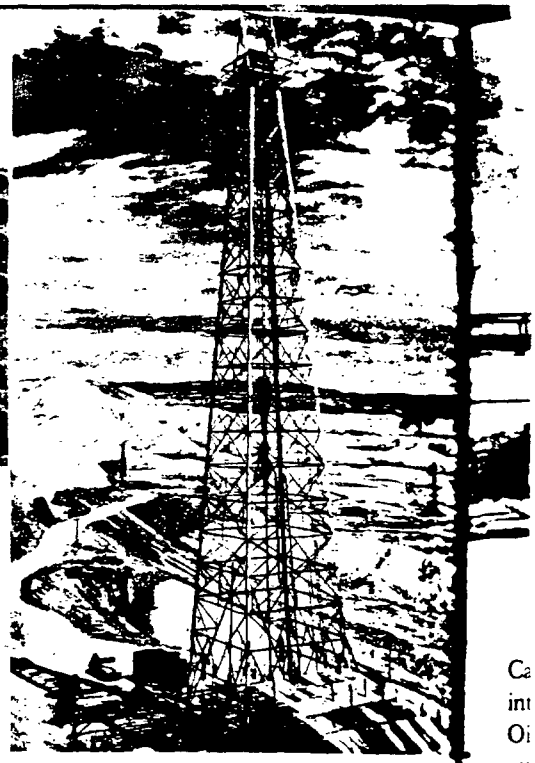
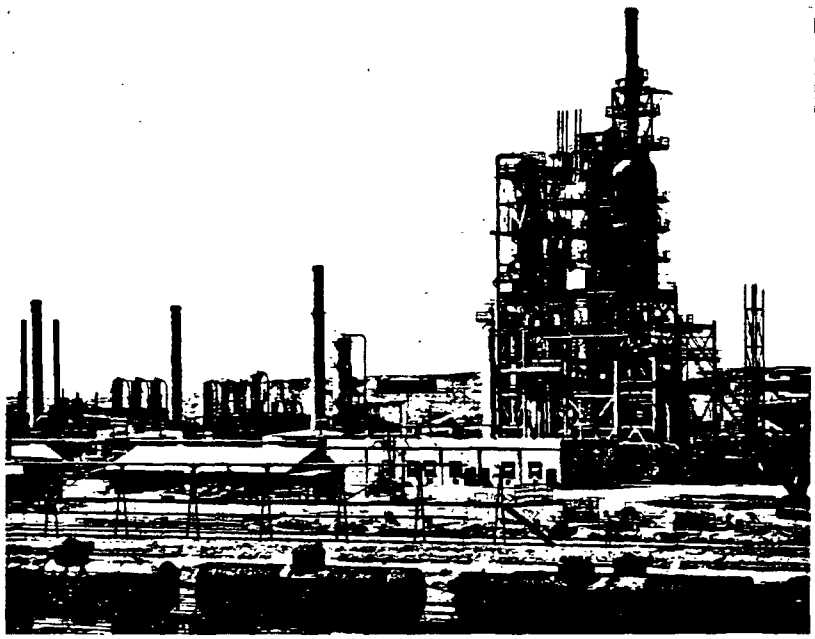


Above, and at the right, are views of the Elk Basin and Rangely fields, which lead the Rockies in oil production

Standard of Indiana's new catalytic cracker is among the new refining facilities being constructed at Casper, Wyo.



bined capacities of the three plants to 40,000 barrels daily.

Refinery construction and expansion at much the same tempo are also going on in the three other major refining centers of the Rockies — Billings, Montana; Denver, and Salt Lake City.

Billings is getting two new refineries. One is a 20,000-barrel plant for Carter Oil and the other is a 7,500-barrel unit for Continental Oil. Both will be completed this year. In Denver, new construction has raised the capacity of Continental's refinery to 7,500 barrels daily. At least three Salt Lake City refineries have been expanded to increased capacity. These are the units of Utah Oil Refining Company, Salt Lake Refining Company, and Wasatch Oil Refining Company. Respectively, these plants now boast daily capacities of 24,000, 15,000, and 4,200 barrels.

Additional pipelines also are planned for the Rockies. Presently, the only major outlet is the Stanolind Pipe Line Company's 10-inch line from central Wyoming to Kansas City, where it ties in with other systems to the Chicago area.

Several new pipelines are said to be under consideration, but details have not yet been disclosed. Reportedly, however, one of the proposed carriers will go from Wyoming to the West Coast. Another is reported headed for Chicago.

To get the picture of what all this oil activity means to residents of the Rocky Mountain area, you have to focus on Casper. This city is Wyoming's processing center and vies with Denver for the title of "Oil Capital of the Rockies."

Over 300 Firms Active

At last count, some 325 firms of one kind or another were represented in Wyoming, including oil companies, tool suppliers, drilling firms, and field service concerns. Virtually all have offices in Casper, and some maintain Rocky Mountain division headquarters there. Office space is not plentiful. One major oil company occupies what used to be a bowling alley. Another is awaiting completion of the Ohio Oil Company's new office building near the

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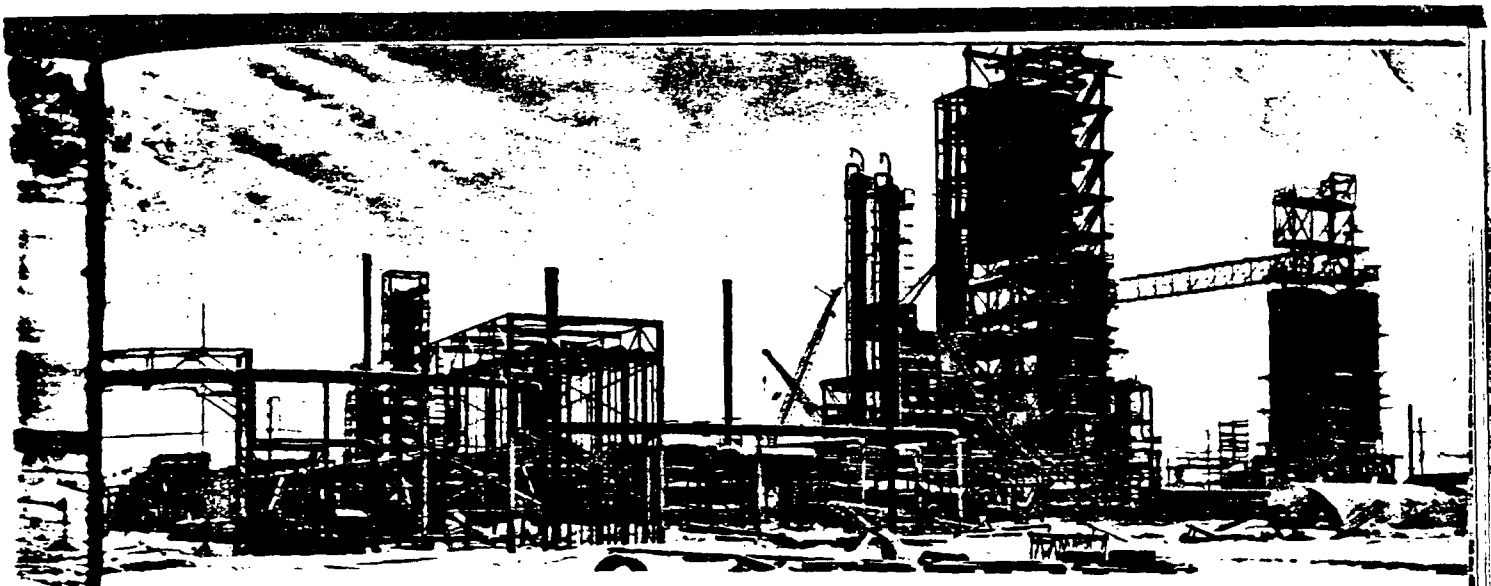


Reflecting the increased tempo of operations in the Rockies, additional refining capacity is being installed. Above, the new Carter Oil refinery at Billings, Mont.

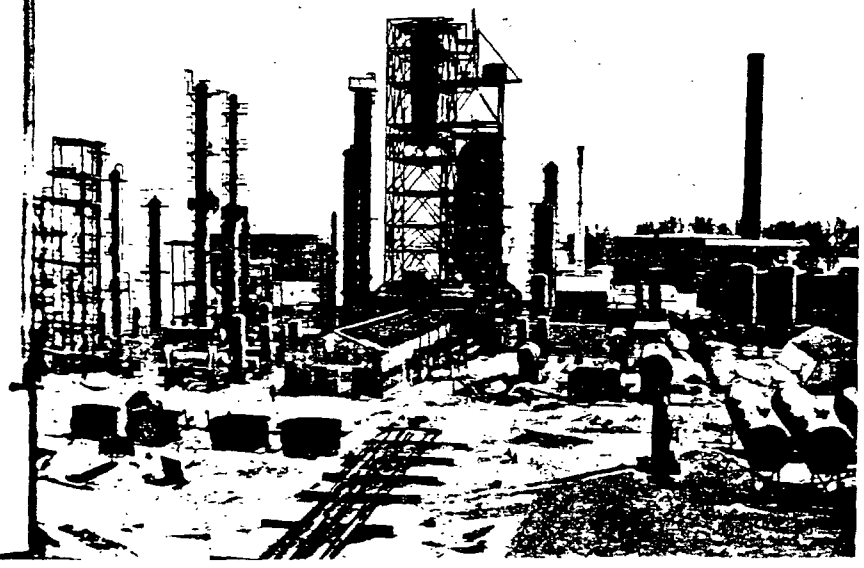
Casper post office so it can move into Ohio's present quarters. Ohio Oil, incidentally, is one of the largest Wyoming producers, and has been in Casper since 1913.

Chiefly as a result of the influx of oil firm personnel, Casper's population has almost doubled to 34,000 since the last census nine years ago. The city's hotels, restaurants, and stores are always crowded. Its building activity has reached an all-time high.

Casper freely admits that it is enjoying the added prosperity occasioned by the Rocky Mountain oil program, but it also is wondering about the future. It knows that in the 80 years since oil was first discovered in the Rockies, the region has seen alternate periods of intense development and of sharp let-down. Heretofore, the problem has been that a sufficient demand did not exist, even locally, in this sparsely settled region, coupled with the expense and difficulty of moving crude and refined products to other consuming areas. The nation's war and postwar appetite for oil, however, wrought a great change.

On whatever basis of operation, large scale or small scale, the industry apparently intends to follow through its quest for oil in the rugged Rocky Mountain countryside. For this is America's latest oil frontier, and the petroleum industry likes nothing better than to roll back frontiers.

OUR COVER: Color photograph of Floating Bridge, Lake Washington, Washington, by Josef Scaylea through A. Devaney, Inc. **OUR PICTURES:** Page 8 (bottom left), Philip Gendreau, (bottom center and right), Press Association; Page 9 (top right), Frederic Lewis, (right center) Press Association; Page 14 (top), E. O. Putnam, Antrim, N. H., (center), Oregon State Highway Commission; Pages 14 (bottom) and 15 (center), Pennsylvania State Dept. of Commerce, (top and bottom right), Harold Orne, Melrose, Mass., (bottom left), Manahan Studio, Hillsboro, N. J.; Page 17, courtesy Buick Motor Division, General Motors Corp.; Pages 19 and 20 (top right), courtesy The Texas Co.; Page 20 (bottom), courtesy The Pure Oil Co.; Page 21 (top left), courtesy Superior Oil Co.; Page 22 (top left) and 23 (bottom), courtesy Continental Oil Co. through World Petroleum; Page 22 (top right), courtesy World Petroleum; Page 22 (center), courtesy Casper, Wyo., Chamber of Commerce; Page 23 (top), courtesy Carter Oil Co.



The second new refinery being constructed at Billings, Mont., is that of Continental Oil Co.

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DYNAMIC COMPETITION

(*Continued from page 6*)

surplus stocks during the summer season proceeded very slowly, and beginning with December 1947 sharp inroads were made in available supplies.

Climax Reached Early in 1948

The climax of the heavy fuel oil shortage was reached during the first quarter of 1948, when stocks declined below the level of the preceding year. During this period the No. 6 fuel oil wholesale spread in the New York marketing area widened abruptly and finally reached 87 cents per barrel. Prices at that time ranged from $3.03 to $3.90. With one short interruption in April, this spread persisted until late in July. From then on it narrowed again consistently and by mid-November had virtually disappeared. During this period the lower end of the price range was held unchanged. Late in November, however, competitive pressure increased to such an extent that the whole price structure began to decline. This period was characterized by the appearance of wider spreads for very brief periods and their almost immediate disappearance – the typical pattern for a period of intense competition.

It is true that the determined "hold-the-line" policy of one of the major sellers in the New York marketing area during this period tended to give the lower end of the price range a somewhat artificial appearance of stability and, particularly during the early part of 1948, probably exaggerated the spread between the high and the low of the range. This illustrates another phase of the concept of dynamic competition. In a period of heavy demand and rising markets, such considerations as public opinion, customer reaction, national policy, and the like may largely restrain price advances, despite the existence of a sellers' market. The significant point is that the sensitivity to such conditions too shows up in the moving picture of the spread over a period of time.

The reversal in the price trend in mid-1948 coincided with the recognition that during the summer months stocks of residual (heavy) fuels were being built up at a much faster rate than during the preceding year. The break in the market occurred when it became evident that the rate of increase for the month of November was fully as large as that for October, and even December failed to show a drop in available inventories.

In sharp contrast to the 1948 pattern, wholesale prices of No. 6 fuel oil in the New York area were virtually uniform during the summer and early fall of prewar 1938. It was not until late in September of that year that a more pronounced price spread developed in line with seasonal factors.

The inference to be drawn from the price behavior of No. 6 fuel oil in this marketing area is that an increase in competition, reflecting the fact that supply is catching up with demand, leads to a rapid narrowing of the spread between prices of individual sellers. And when competition becomes highly intensified, as caused late in 1948 by the appearance of an oversupply and in 1949 by a decline in business activity, it forces all sellers to quote the lowest prices in the market.

Retail Pattern Parallel

The retail price pattern of heavy fuel oil in the New York marketing area (EXHIBIT II) closely parallels that in the wholesale field. For the two years 1947 and 1948 it shows an almost complete cycle from virtually uniform prices early in 1947 to extremely wide spreads during the 1947-1948 heating season, and back to the almost complete disappear-

EXHIBIT III

Price Spreads in No. 2 (Light) Fuel Oil in the New York Wholesale Market

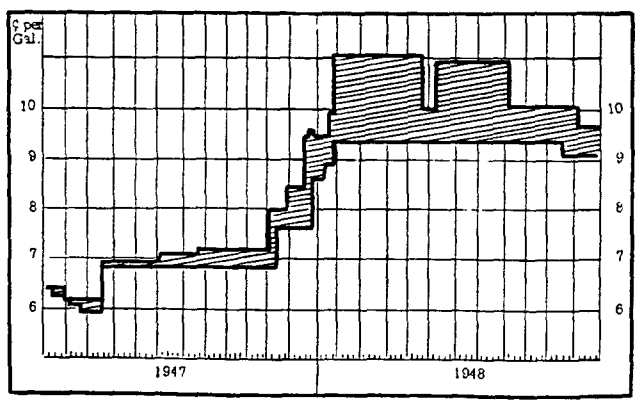
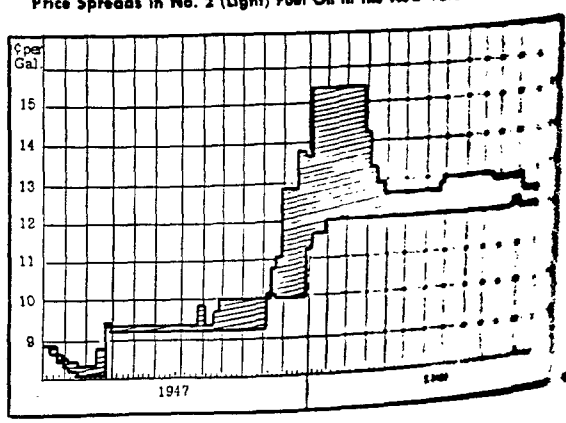


EXHIBIT IV

Price Spreads in No. 2 (Light) Fuel Oil in the New York [illegible]



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ance of price spreads toward the end of 1948. Here, too, the "break-pattern" late in 1948 shows the step-like appearance of momentary spreads and their almost immediate disappearance as price cuts of one seller were quickly followed by all others.

It is interesting to note that the narrowing of the spread in the retail market started several months ahead of the weakening in the wholesale price structure; in other words, that competition was felt first at the retail level.

Light Fuel Oil

The price-spread pattern for No. 2 fuel oil in the New York wholesale market (EXHIBIT III) shows that the rush toward the climax of the post-war sellers' market late in 1947 was accompanied by a marked widening of the differences between the quotations of individual sellers.

While the improvement in the light fuel (heating) oil outlook during 1948 also was considerable, it was not nearly so pronounced as in the case of heavy fuel oil. In contrast to No. 6 oil, inventories of light fuel oil at the start of the winter heating season in December dropped almost as sharply as during the same month of 1947, despite unseasonably warm weather.

The price-spread patterns indicate a difference of competitive pressure in the No. 2 and No. 6 fuel oil markets in the New York area. Prices of No. 2 oil did not weaken so much, and price spreads at the end of the period covered were still relatively wider than in the residual fuel market.

The No. 2 fuel oil retail market in the New York area (EXHIBIT IV) shows a pattern of price spreads very similar to that of the wholesale market. Here too, as in the No. 6 oil market, weakening in the retail price structure preceded the decline in the wholesale market by several months.

The acute heating oil shortage of the 1947-1948 winter is illustrated by the fact that the retail price spread for No. 2 oil in the New York market went as high as 3.8 cents per gallon at the start of 1948. This wide spread was due not so much to differences between postings of the major companies as to the pricing practices of independent jobbers. The spread shrank rapidly during April and remained relatively stable during the rest of the year. Up to the end of 1948 no drop had occurred in the low point of the price range, in sharp contrast to the heavy fuel oil market.

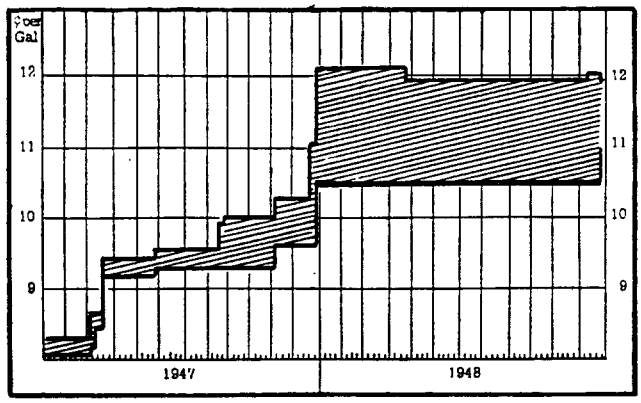

EXHIBIT V
Price Spreads in Unbranded Gasoline in the New York Wholesale Market

While widening of price spreads in a sellers' market normally means that cost differences then tend to play a larger role in price determination, such wide differences as existed in the New York light fuel oil retail market in the winter of 1948 reflected the fact that some sellers were making the most of competition among buyers for needed supplies.

Gasoline

The spread between quoted prices of unbranded gasoline in the New York wholesale market (EXHIBIT V) widened greatly as the level of prices advanced through 1947. By the start of 1948 the maximum spread was 1.7 cents per gallon. Only two changes occurred during 1948. The top of the range was lowered 0.3 cents per gallon in April, while a small increase in prices occurred just before the end of the year.

The narrowing of the range in April 1948 coincided with the start of the summer selling season, when it became evident that earlier fears of extreme gasoline shortages during the summer would not materialize. In fact, gasoline stocks throughout 1948 remained comfortably above the level of 1947.

1948 and 1938 Experience

The firming of the East Coast gasoline price at the close of 1948 is less readily explicable. It may have been caused by the fact that consumption held at better than a seasonal level because of relatively warm weather in the early winter, which encouraged driving. But it may also have reflected, in part, efforts of sellers to maintain their over-all product margins in the face of the decline in heavy fuel oil prices. In contrast to this experience, we can look back at the competitive conditions in the New York gasoline market throughout the summer and fall of 1938; the price spreads were narrow, changed frequently, and affected both the upper and lower ends of the range.

Study of the gasoline price spreads shows that so long as no serious competitive pressure exists, differ-

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ences in cost are reflected in a relatively wide spread between prices of competing sellers in one area.

Conclusion

Summing up the statistical analysis of price spreads in the New York area, we find strong evidence of keen but varying competition in the sale of major refined petroleum products. The basic generalization seems warranted that (1) when supplies are tight, such factors as cost differences and individual administrative policy come into play and cause the spread between prices of individual sellers to widen; and (2) when supplies are ample, such spreads disappear because competitive selling in a buyers' market demands that all sellers meet the lowest market price, unless they want to lose sales volume rapidly.

Proof of Competition

The evidence, as the authors see it, is that identical prices, when they occur *as part of such a moving price pattern*, give clear proof of market competition rather than of collusion — even if identity of prices occurs quite frequently and over relatively protracted periods.

It does not follow, needless to say, that identical prices even in the absence of such a demonstrable pattern of price spreads necessarily support an inference of collusion; for price identity may be due to other causes arising out of the nature of the industry or market, perhaps emphasizing nonprice rather than price competition. This statistical technique functions in much the same way as paternity blood tests; certain groupings irresistibly exclude paternity, but the absence of such groupings does not prove paternity, which must then be determined by other means.

Once this concept of dynamic competition is recognized, many of the seeming contradictions in public criticism of competitive conditions in the petroleum and other industries resolve themselves. Those who criticize an industry on the ground that competition is not sufficiently keen tend to cite conditions that prevail while a sellers' market exists. Those who set out to prove the existence of wasteful and cutthroat competitive practices select cases where a buyers' market prevails.

Degree of Rivalry Varies

Our study showed that the American petroleum industry, in the area examined, is a good example of dynamic competition, for the degree of rivalry among sellers and buyers varies from time to time with changing supply and demand relationships for the products of the industry as a whole, for individual products, and in particular localities. And only in the light of such a theory of dynamic or variable competition can one obtain a realistic and accurate view of competitive conditions in this industry.

More Accurate Term

The term "dynamic competition," we believe, is far more accurate in describing selling conditions in this and many other industries than the greatly overworked, misunderstood "monopolistic competition." The dynamic and changing character of competition in the petroleum industry was implicitly recognized in a statement by one oil company executive to the Wolverton Committee of the House of Representatives, to the effect that "competitive considerations or basic economic factors affecting the entire industry may influence us to make the same move as a competitor, or one which is greater or less." [3]

If competition is dynamic rather than static, the degree of competition which exists in any industry can be tested, by observation and measurement of such phenomena as price behavior, only *over a period of time* and *under changing conditions*. It is realized, of course, that the applicability of the technique we used in our oil price study to other industries will depend on proper modifications because pricing practices differ from industry to industry.

Another Applicable Test

Moreover, in the light of this approach, competition could be tested not only by the price-spread pattern but also by the pattern of variations in other measurements such as profits. If competition is dynamic, we must expect that there will be times when profits will be large because competitive pressure is at low ebb, and there will be times when profits are small or nonexistent because competition is extremely keen. The period following the end of World War II was one in which competition was quite limited even in such industries as coal mining, textile manufacturing, and retail trade, where it is usually quite pronounced. Increases in profits were, in fact, larger in these industries than in others, precisely because variation in competitive conditions is so much more pronounced in these industries than in others.

A series of industry studies using this approach to measure the variation of competitive conditions would demonstrate the highly dynamic character of competition throughout the private enterprise economy.

[3] Testimony before the Wolverton Subcommittee of the House Committee on Interstate and Foreign Commerce during its fuel investigation, January and February, 1948.

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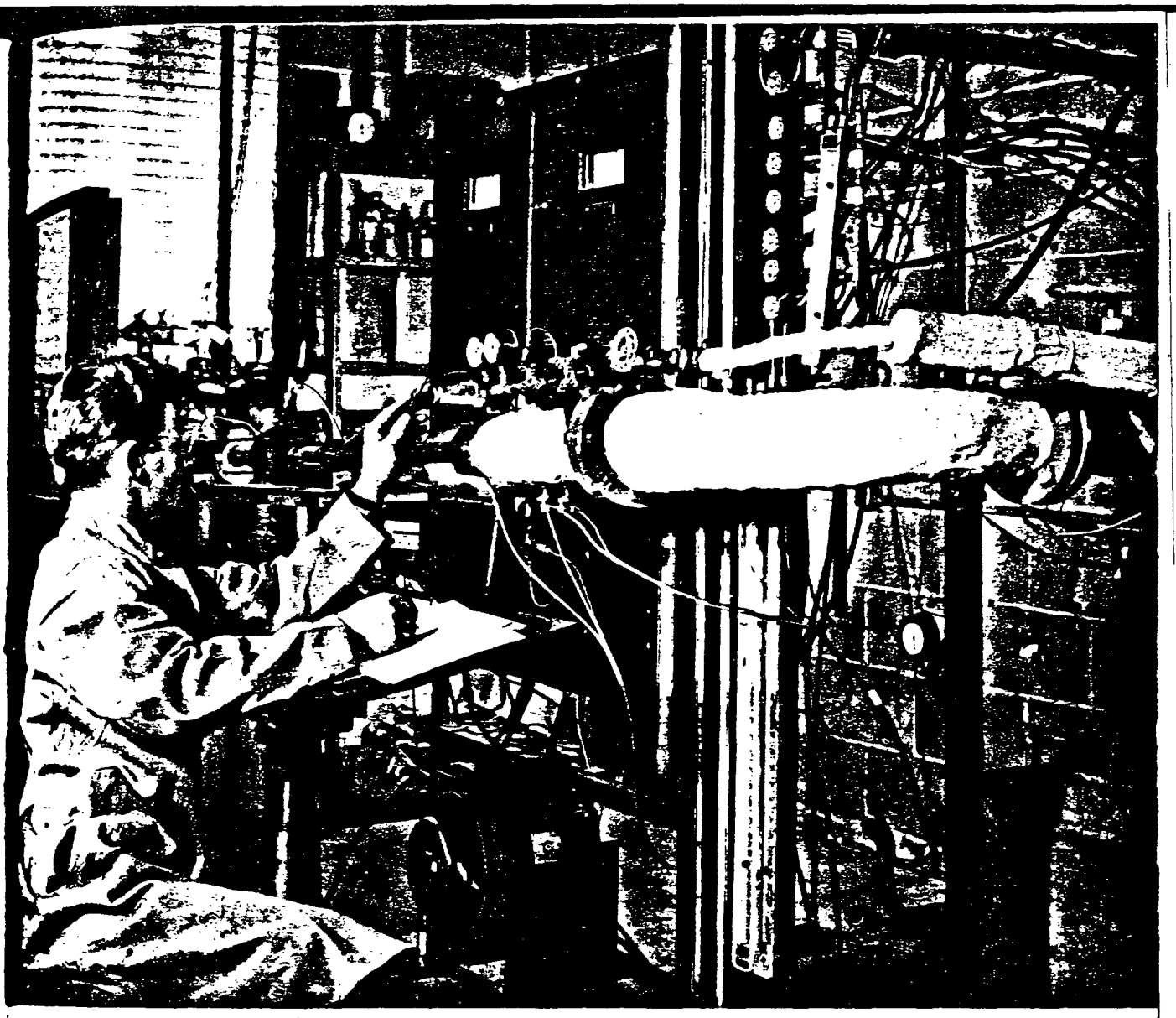

KEEPING UP WITH THE JETS

From a fuel study standpoint, the unique apparatus pictured above is the alter ego of a turbo-jet engine capable of powering a plane at supersonic speeds almost eight miles above the earth's surface.

Formally, the apparatus is a one-tenth scale model can-type combustor similar to those to be found on aircraft turbo-jet engines. More commonly, it is referred to simply as a jet tube.

The jet tube was devised and designed by the Aviation Products research staff at the Ethyl Corporation Research Laboratories in 1945. Since then, continuing use of it in Ethyl's "basic research for the future" studies has brought about many novel improvements in its design, structure, and method of operation. As can be seen from the photo, it appears to be nothing more than a punctured metal cylinder surrounded by glass. A special air supply arrangement is at the right end of the tube setup and several thermocouples for measuring exhaust gas temperature are located at the extreme left.

The jet tube program is part of Ethyl's basic research in combustion as it occurs in all types of engines. Through use of the tube it is possible both to study the burning characteristics of jet fuels and to evaluate the effects of possible jet fuel additives on those characteristics. Studies are conducted over a wide range of duplicated turbo-jet engine conditions and at many simulated engine speeds and plane altitudes.

Most of today's major jet aircraft combustion problems are being encountered under high altitude conditions. For that reason, it is particularly important that the jet tube can approximate engine operation in the 35,000 to 40,000-foot height range — and at the full rated speed of the average turbo-jet engine. With an eye to future aviation developments, Ethyl engineers have so designed the tube that it will simulate engine operation at even greater altitudes.

In the interest of national defense, Ethyl has made available schematic and detailed drawings of the tube and its allied equipment to the U. S. Air Force, the Navy Department Bureau of Aeronautics, the National Advisory Committee for Aeronautics, and to oil companies and aircraft engine manufacturers doing research along the same lines.

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Large protruding ears distinguish the **CHIMPANZEE** from other apes. He's the most intelligent of the apes.

The snake charmer's **BOA CONSTRICTOR** is identified by its special color pattern—brown skin, covered with many tan saddle-shaped crossbars that become brick red near the tail.

Small ears distinguish the **INDIAN ELEPHANT** from the African species. Most circus peanut eaters are Indian elephants.

When you go to the circus

THE "TRADE-MARKS" OF NATURE*

identify the animals you see

The trained "seals" in the circus are usually not seals but **SEA LIONS**—distinguished from true seals by their small ears and their ability to turn their hind flippers forward and under when moving about on land.

When you buy gasoline

THE TRADE-MARK "ETHYL"

identifies gasoline stepped up with "Ethyl" antiknock fluid

FOR A NEW HIGH IN PERFO

. . . for the extra thrill of an engine
its best . . . for top power on hill and
traffic . . . for more pleasure in driving
ask for "Ethyl" gasoline—high quality
line improved with "Ethyl" antiknock fluid
the famous ingredient that stops
and performance.

"Ethyl" antiknock fluid is made by ETHYL CORPORATION, Chrysler Building, New York, N.Y.

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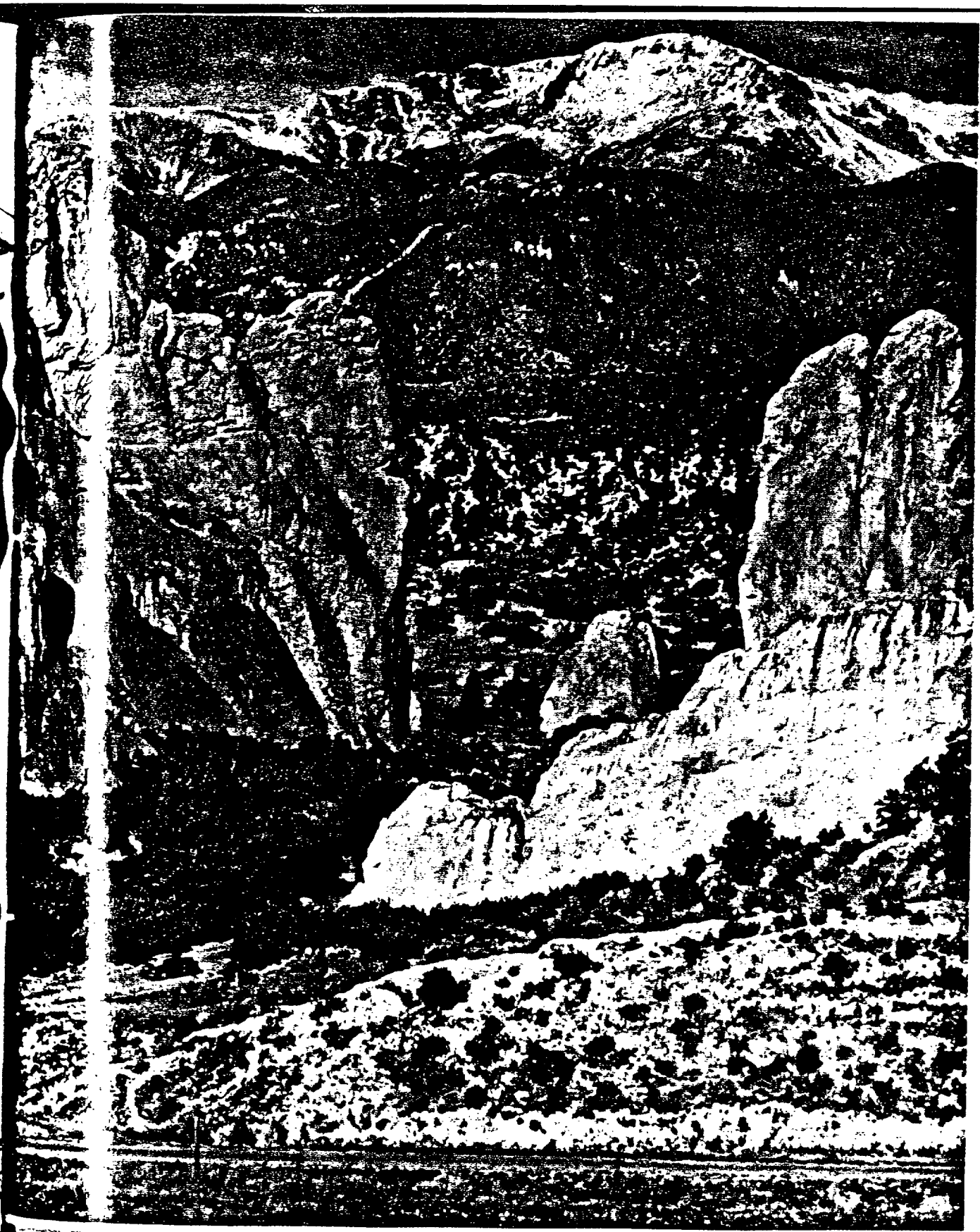

ETHYL NEWS

ETC 24136

AUGUST ★ 1949 ★ SEPTEMBER

IN THE

ETHYL NEWS

AUGUST-SEPTEMBER 1949

Charles M. Gambrill of Ethyl Corporation's research staff has been named chairman of the American Society for Testing Materials' newly-created Research Division on Elemental Analysis.

Formation of the Research Division is part of the reorganization of the ASTM's Committee D-2 on Petroleum Products and Lubricants. It will be the responsibility of Mr. Gambrill's unit to develop and standardize all physical and chemical methods for the determination of elements in petroleum, petroleum products, and petroleum additives.

At the Ethyl Research Laboratories in Detroit, Mr. Gambrill is head of the Analytical Section. He has been associated with Ethyl for almost 22 years, having joined the company as an analyst early in 1928, when the Ethyl Laboratories were located in Yonkers, N. Y. He became head of the Analytical Section in 1936.

Mr. Gambrill obtained his B.S. degree from the University of Maryland in 1924. Prior to joining Ethyl, he was employed by the U. S. Bureau of Mines in Pittsburgh and by the Mathieson Alkali Works, Inc., in Niagara Falls, N. Y.

During recent years, Mr. Gambrill has headed up two ASTM committees, and has served as chairman of the Association of Analytical Chemists and as a councillor of the Detroit Section of the American Chemical Society. In addition to his newest post, he is currently serving on the American Petroleum Institute's Committee on Analytical Research and as secretary of the Detroit District Council of the ASTM.

OCTANE NUMBERS AND ANTIKNOCK PERFORMANCE 3

Techniques for evaluating the antiknock quality of gasoline are sometimes difficult for the layman to understand — but they play an essential role in gasoline technology. This article tells how laboratory knock-test methods have evolved through the years, as the changing requirements of automobiles and progress in motor fuels have moved ahead together.

THE MAN NOBODY KNEW 8

As the oil industry observes the ninetieth anniversary of its founding, it is interesting to document some of the little-known facts about the man responsible for its being.

CHEYENNE FRONTIER DAYS 12

The Old West isn't dead — it lives again every year as the capital of Wyoming stages a five-day, action-packed spectacle.

THE PROMISES SALESMEN LIVE BY 14

Trade-marks are familiar symbols to everybody. But not everyone realizes how strongly they influence the consumer's choice of a product.

CONSULTANT TO THE FARMER 19

Once upon a time, the retailing of farm equipment was a sideline for the town hardware man or blacksmith. Today it is a full-fledged business that requires men well versed in all the problems of agriculture.

ANTIKNOCK REQUIREMENTS OF COMMERCIAL VEHICLES 23

Many surveys of the antiknock requirements of passenger cars have been made, but comparatively little information has been obtained on the requirements of commercial vehicles. This paper presents the results of a survey conducted by three companies — Shell, Socony-Vacuum, and Ethyl — and reports some significant findings.

RACING AT ITS PEAK 28

Pikes Peak presents a stern challenge to contestants in the Labor Day Hill Climb, as drivers race against time up 12½ miles of the most rugged natural racing course found anywhere.

In order to widen the fields of reader interest in Ethyl News, we frequently publish articles contributed by writers not associated with Ethyl Corporation. Opinions expressed in signed articles are the authors'. The editors of the News welcome articles of timely interest submitted from outside sources.

Published by ETHYL CORPORATION, 405 Lexington Avenue, New York 17, N. Y.

Manufacturer of "Ethyl" antiknock compounds, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, secretary

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OCTANE NUMBERS AND ANTIKNOCK PERFORMANCE

the meaning of knock-testing methods

A new standard for "Ethyl" gasoline—of 86 octane number by the Research Method—has been established, effective September 19. This new standard, which was decided upon after careful study, is a reflection not only of the generally higher octane requirements of cars, particularly new models, but also of the way the newer cars tend to rate fuels on the road. The accompanying article is presented for the benefit of those interested in a general description of how knock-testing methods have evolved through the years. The advice and assistance of Ethyl's Research Laboratories are available on all technical phases of the subject.

The Editors

ONE PROBLEM of long standing in the oil industry has been to develop laboratory methods for determining the antiknock quality of gasoline which would reflect its antiknock performance in cars on the road. The complexity of the problem is apparent when it is realized that no entirely satisfactory single laboratory method has been developed to date.

All along, the task has been to develop laboratory test equipment and a testing procedure which would act as a common denominator both for the millions of cars in operation and for the various types and blends of gasolines available to power them. The greatest difficulty arises because of the many variables involved both in fuels and in engines. For example, consider the car population.

If all cars had the same appetite for fuels – that is to say, if they all rated gasolines in the same manner — it probably would be possible to duplicate those test conditions in the laboratory. But unfortunately they don't, as everyone knows, because of differences in engine design, differences in age and condition, and differences in type of service. Even in new cars of the same make and model, successive units coming off the same assembly line may show a widely varying tendency to knock.

And now, consider the various fuels. The many differences among the various components of motor fuels present another set of variables. Some fuels show their greatest tendency to knock at low speeds, others knock at high speeds – in the same engine. This is one reason why the performance of fuels on the road may differ from that which would be predicted on the basis of their laboratory octane numbers.

Nevertheless, it is essential that refiners have practical methods for determining the antiknock quality of their gasolines, for two important reasons. They naturally want to market fuels that will give the best possible road performance for the greatest number of cars. They also need a day-to-day means of measuring and controlling the antiknock

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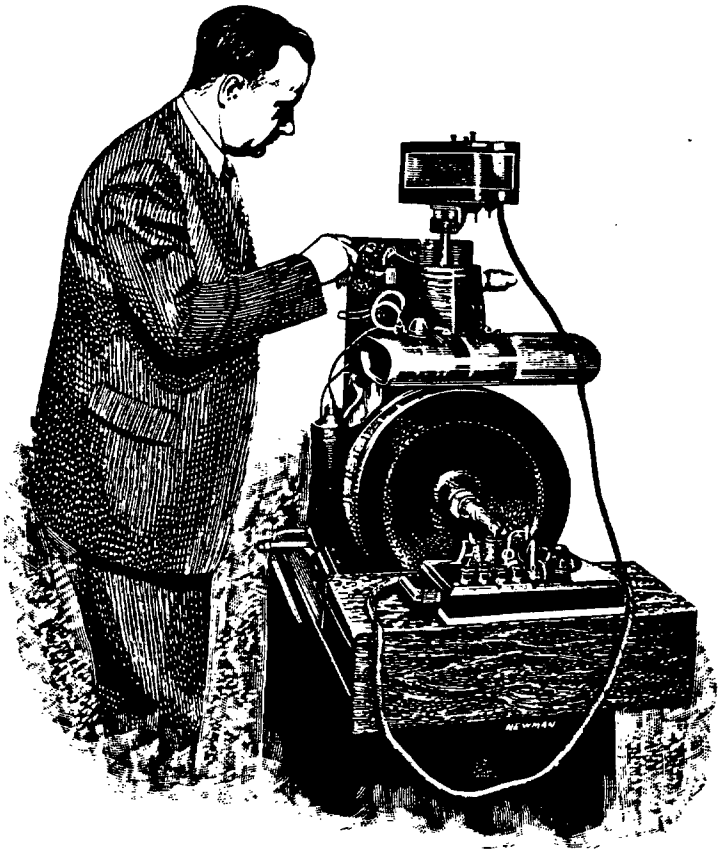

The late Thomas Midgley, Jr. tested the antiknock value of tetraethyl lead in this crude forerunner of today's test engine

quality of the gasolines they are producing. Thus, through the years, there has been a continuing effort – in the research laboratory and on the highway – to obtain a close "correlation" between road and laboratory ratings and thereby to keep motor fuel quality abreast of the changing requirements of automobiles.

Origin of the Octane Scale

The concept of antiknock quality goes back more than a quarter of a century, when the late Thomas Midgley, Jr. discovered the antiknock properties of tetraethyl lead, and "Ethyl" gasoline was first marketed. It is interesting to note that, even in those days, laboratory tests and road tests were used to rate gasoline.

The effectiveness of tetraethyl lead as an antiknock agent was first demonstrated in a single-cylinder laboratory test engine, which was a crude forerunner of the standard test engine now in use. The value of tetraethyl lead on the road was proved when Dr. Midgley had friends and acquaintances try it out in their cars. The motorists, of course, knew nothing about octane numbers and very little about antiknock performance. But when they used gasoline containing tetraethyl lead in impromptu hill-climbing tests, they saw at once that it took the knock out of the gasoline and gave an extra surge of power to their cars.

During those early days there was a recognized need to standardize motor fuel quality by laboratory determination. There was no universally accepted standard of antiknock quality at the time, and refiners used various scales to express it. Thus it was a major step forward when the octane scale was invented in 1926.

Dr. Graham Edgar, of Ethyl Corporation, was then seeking a stable yardstick by which the antiknock quality of motor fuels could be measured. To do that, he selected two pure chemicals, both hydrocarbons in the gasoline boiling range. One was iso-octane, which had (and still has) a higher antiknock value than any commercial motor fuel. The other was normal heptane (originally obtained from the Jeffrey pine tree, but now made from petroleum), which had a very much lower antiknock quality than any commercial motor fuel. To these he assigned the arbitrary values of 100 and zero respectively. Thus, a mixture of 60% iso-octane and 40% normal heptane was said to have an octane number of 60; a mixture of 70% octane and 30% normal heptane had an octane number of 70; and so on. The different mixtures then served as standards of comparison whereby the equivalent octane number of an unknown fuel could be established. Today, this is done by running a sample of the unknown fuel through a standard knock test engine and matching its knocking tendency with that of a blend of these two hydrocarbons. The percent of iso-octane in this matching blend is then the octane number of the fuel under test.

Set a Universal Standard

The octane scale, which was generally adopted in 1930, represented an important contribution. It provided the oil industry with a reproducible standard for measuring the antiknock quality of gasolines. The octane scale has retained its value through the years, even though it cannot be used to rate fuels above 100 octane number. As the chemical composition of gasoline has grown

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more varied and complex, the standards of reference – blends of isooctane and normal heptane – have remained the same.

Evolution of Knock-Test Engines

The Ethyl Corporation was a pioneer in the development of knock-test engines. For a number of years prior to the advent of the present CFR engine, it experimented with and developed several series of engines which were made available generally to oil and automotive laboratories. One of these engines was the well-known Series 30 model, of which over 150 units were manufactured and distributed by Ethyl to various organizations in a two-year period. The Series 30 and earlier engines are credited with successfully filling the gap until the standard CFR engine was developed and accepted by the oil and automotive industries. Interestingly enough, the CFR engine, as it finally evolved, incorporated most of the major technical features that were developed as part of the earlier Ethyl engines – including the knockmeter instrument which indicates the relative intensities of knock.

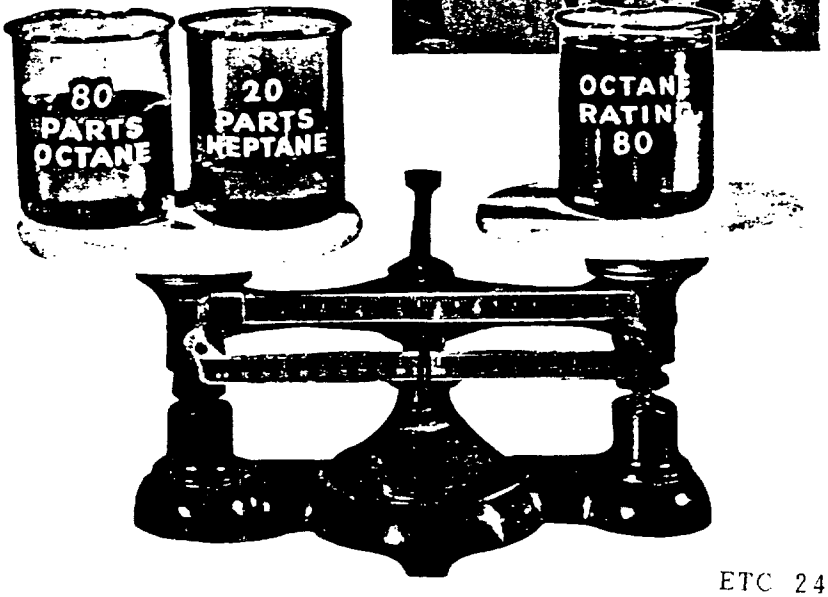
The second major development in knock-testing methods was the introduction of the CFR single-cylinder knock-test engine. Years of effort went into its development, and today that knock-test engine is a standardized laboratory tool and a common sight in any laboratory where gasoline quality is evaluated. By standardizing every feature of the CFR engine, and every detail of operation known to have a significant effect upon octane number, it became possible to test gasoline in many laboratories under controlled conditions. Together, the octane scale and the CFR engine have provided two constants in a field of continuing change.

Motor Method of Test

The need for a satisfactory laboratory method of octane number determination which would show close agreement with the antiknock performance of fuels on the road was early recognized by both the automotive and petroleum industries. Numerous cooperative efforts through the Coordinating Fuel Research Committee (CFR) have been undertaken by both these industries. Among the first were the road tests held at Uniontown, Pennsylvania, in the summer of 1932. Out of these Uniontown tests grew the now familiar Motor Method laboratory test. Fuel ratings obtained in the laboratory by this method correlated quite well with the road ratings obtained at that time.

The Motor Method, as developed by the Coordinating Fuel Research Committee (CFR), was adopted by the American Society for Testing Materials (ASTM) in 1933 as a tentative standard. In 1939 it was accepted as a permanent standard, and until recently it was generally employed for the determination of antiknock quality in the production and marketing of gasoline. The minimum antiknock quality of "Ethyl" gasoline also was specified on the basis of Motor Method rating.

Considered against the backdrop of the times, the Motor Method played an important role in broadening the understanding of fuel and engine relationships. It should be emphasized that when it was introduced, the Motor Method was designed to rate gasolines available in 1932 on the basis of their performance in cars in use in 1932.



Above, right, Dr. Graham Edgar, vice president of Ethyl Corporation, who invented the octane scale . . . Right, an easy way of visualizing the application of the scale of values of the octane scale is by this illustration

However, important trends were beginning to develop in both engine design and gasoline refining. Engines were being produced with higher compression ratios, and other features of design were undergoing change. The chemical composition of gasoline was beginning to change and become more varied. A number of technologists began to question whether the Motor Method was accurately reflecting the effects of these changes.

Toward Research Ratings

Accordingly, another cooperative road test program was conducted at Uniontown in 1934. At the same time several experimental laboratory test methods were investigated. As a result of these road and laboratory tests, there was a growing conviction that the Motor Method was becoming less reliable as an index to road performance of fuels. This work seemed to indicate that no single laboratory test method would provide perfect correlation with average road results. In addition, the test conditions employed in the Motor Method were considered to be too severe and it was believed a second but less severe test method was needed.

Finally, after careful study and very extensive road and laboratory tests in 1937 and 1938, the CFR standardized a method which became known as the 1939 Research Method. With the incorporation of minor refinements, the 1939 Research Method became the CFR Research or F-1 Method. This new method was generally considered to be a valuable addition to the standard test procedures because knock ratings obtained by it pointed in the same direction as ratings obtained on the newer fuels in cars then being produced. Extensive road tests in 1940 and 1941 substantiated this trend. The Research Method was adopted as a tentative standard by the ASTM in 1948. For some time prior to this date many refiners had used it in conjunction with the older Motor Method for obtaining a more comprehensive indication of the antiknock quality of fuels under a range of service conditions.

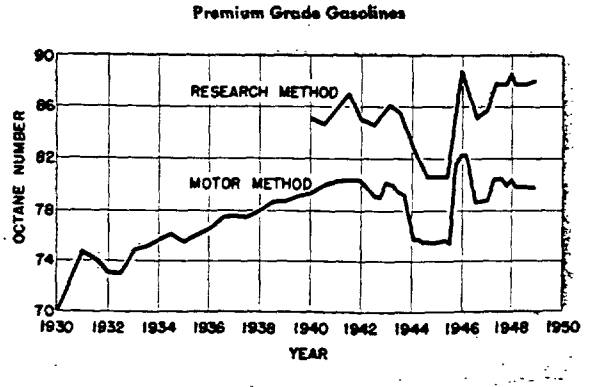
Increased attention was paid to the spread between the ratings obtained by the two methods. This spread, which is simply the Research rating of a fuel minus its Motor rating, is called "sensitivity" or "jump." Thus, a fuel which rates 86 octane number by the Research Method and 76 octane number by the Motor Method has a sensitivity of 10, and is called a "high-jump" fuel. Fuels showing little spread between the two ratings are termed "low-jump" gasolines.

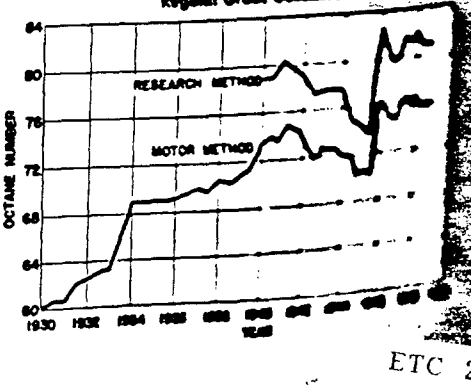
Numerous tests of the road performance of gasoline, coupled with comparisons of the Motor and Research Method ratings, have led to some broad conclusions. In general, if two gasolines have the same Motor octane number, the fuel having the higher Research rating will usually give the best road performance. This is because a large percentage of passenger cars exhibit their greatest tendency to knock at low engine speeds, and at this point tend to rate fuels in a manner similar to the Research Method. However, if two fuels have the same Research octane number, the one having the higher Motor rating will usually give the best over-all road performance. This results from the tendency of a certain percentage of cars to knock at high engine speeds, where engines tend to rate fuels more nearly in the order of their Motor Method ratings.

Changes in Fuels and Engines

The war, of course, interrupted the progress the industry was making toward higher octane numbers for automotive gasoline. But it by no means halted progress in other directions. The wartime aviation gasoline program required extensive construction of refining equipment for the production of high-octane stocks. Since the war many of these facilities have been turned to the production of higher quality motor fuels, and have been supplemented

TRENDS IN ANTIKNOCK QUALITY





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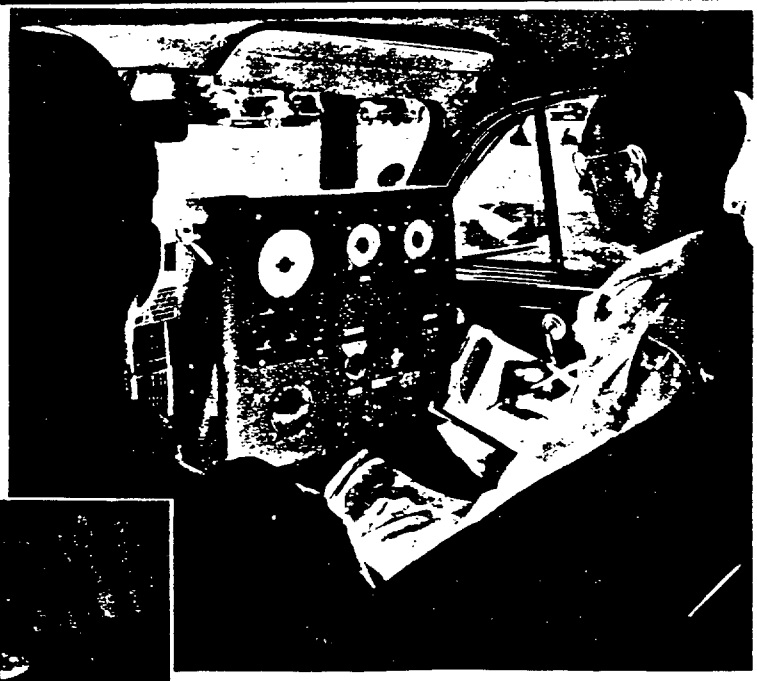
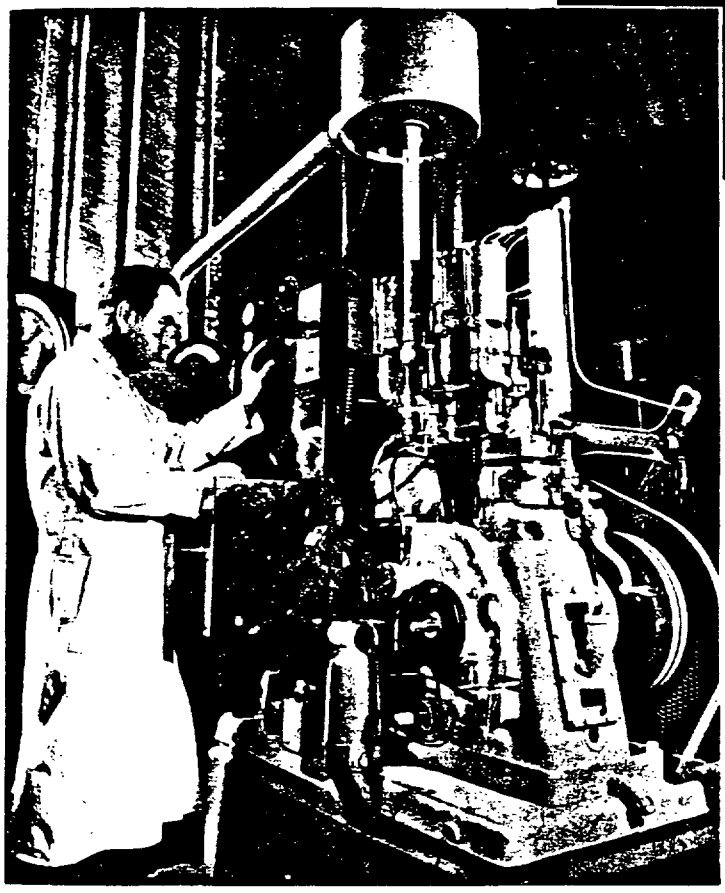


Laboratory octane numbers of gasoline are determined with the single-cylinder CFR engine shown below, while road ratings are obtained from tests on the highway with fleets of representative vehicles. Obtaining a close correlation between the two sets of ratings is a continuing aim of the oil industry, as it seeks to make octane numbers reflect accurately the changing fuel requirements of automobiles



by extensive post-war refinery construction. The net effect has been not only a substantial increase in the capacity for making higher octane number base stocks but also a far greater facility in varying the chemical composition of motor fuels.

Results of nationwide surveys show representative post-war motor fuels exhibit a substantial improvement in road performance over their pre-war predecessors. Although the new refining processes have resulted in some increase in Motor octane numbers, the marked superiority in antiknock performance of these gasolines on the road is more nearly reflected by the improvement in their Research octane numbers. Most premium fuels now have Research ratings in the range of 86 to 90 octane number or higher.

Closest agreement of fuel performance in cars with laboratory ratings obtained by the Research Method generally occurs in the post-war models. It is significant that a number of automobile manufacturers now express fuel requirements of their new models in terms of Research octane numbers. Equally significant is the fact that many refiners rate their gasolines by the Research Method for refinery control and marketing purposes.

An Evolutionary Process

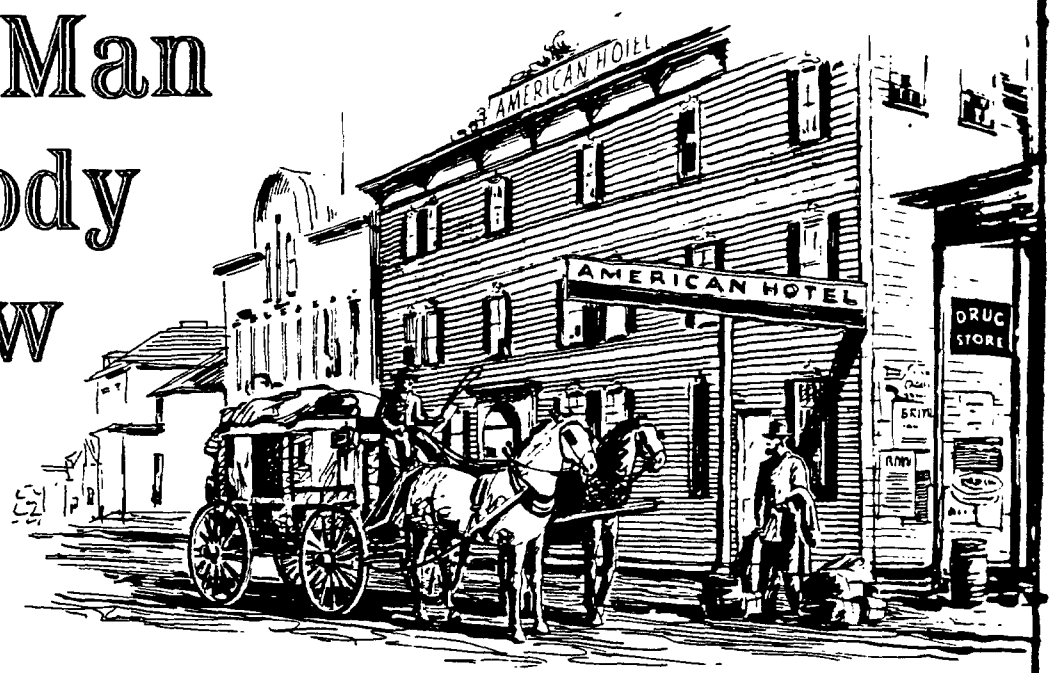
The development of automotive engines and of fuels for their operation is an evolutionary process which undoubtedly will continue indefinitely. As new factors in engine operation and gasoline refining exert their influence on fuel knocking, it may become necessary to revise knock testing methods from time to time in order to give recognition to these additional variables. The Ethyl Research Laboratories, in cooperation with oil companies and engine manufacturers, continuously study these trends in their relation to evaluation of antiknock quality.

Ethyl's technical staff is always available to discuss problems of knock testing – not only as they relate to present conditions but also to those expected to prevail in the future.

ETC 24142

The Man Nobody Knew

By Harry Botsford



Ninety years after Edwin L. Drake founded the oil industry, one element of his personality remains dominant

ON AUGUST TWENTY-SEVENTH the oil industry celebrates its ninetieth birthday. The occasion will be fittingly observed, both nationally and locally, as spokesmen recall that historic day when the industry came to life in the hills of western Pennsylvania.

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

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

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

An Obscure Figure

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

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

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

He wasn't working at the time, but was recovering from a malarial fever and living in the Tontine Hotel at New Haven, where he met James M. Townsend, a banker. Drake was tall, his beard was black, his hair carefully brushed. He walked with a slight stoop, and there were lines of suffering around

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his melancholy eyes. He dressed neatly and carefully; his speech was that of an educated man. His manner was quiet and he was not given to idle talk. His first wife was dead; he had remarried, and there was a little girl whom he worshipped.

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

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

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

Townsend's promise of dividends didn't materialize. Drake felt unhappy about it, said as much to the banker, who promptly countered with a proposal that Drake go to Titusville as the agent for the company, at an annual salary of $1,200. Townsend knew that Drake could travel on a railroad pass; thus there would be no travel expense. Drake was far from being well, but he accepted the offer with good cheer. It has been said that the idea of drilling for oil was Drake's, but there is no supporting evidence. At any rate, the stock certificates for the Seneca Oil Company pictured an artesian well derrick. . . .

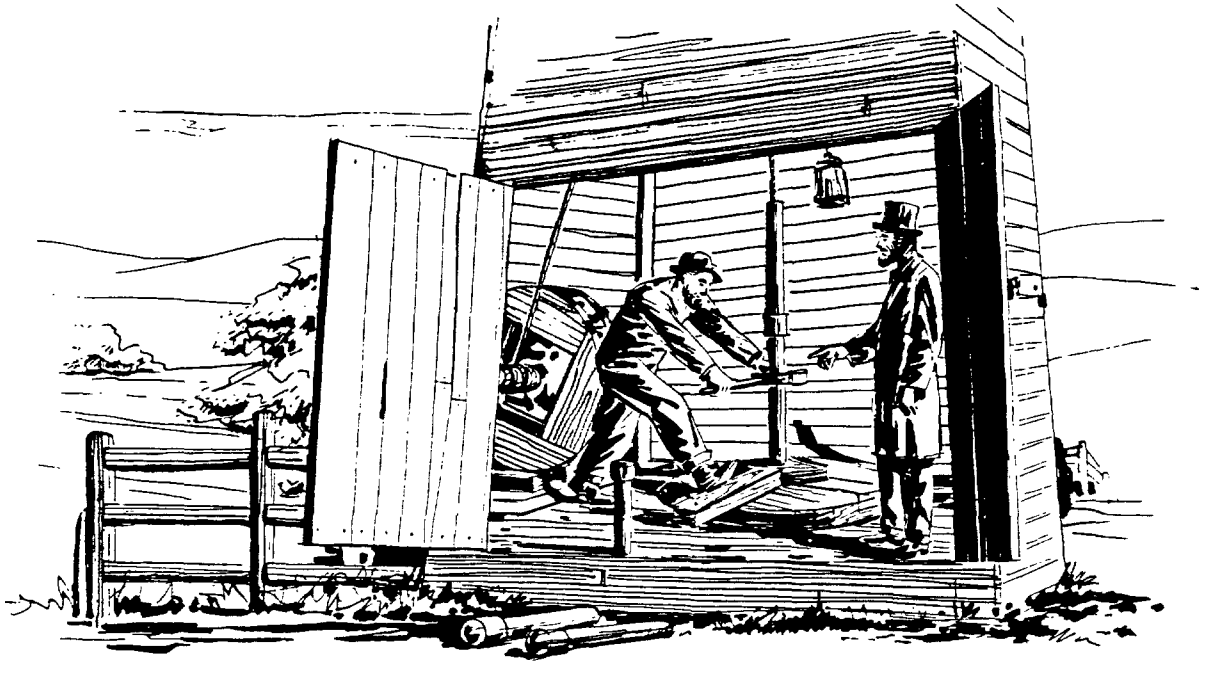
Drake was thoroughly briefed as to the nature of the reports he was to make; every cent expended was to be accounted for. Once Townsend paused in his instructions and smiled thinly. "Your mail will be addressed to 'Colonel' Edwin L. Drake," he said quietly. "That will impress the villagers, it will help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

A 'City Man' Comes to Town

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

He went about his job methodically. He was a stranger, and the villagers spotted him as a city man – which he was. That he proposed to drill a hole and produce a lot of "rock oil" was something they con-

The perseverance of Colonel Drake was perhaps the greatest single factor in the success of his well



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sidered the footless endeavor of an alien stock company, a specious sort of mysterious swindle. But the merchants of the little village found him to be fiercely and ruggedly honest, a reputation that eventually was responsible for the successful completion of the project.

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

He borrowed a horse from Ruel Fletcher, a merchant and one of his close friends, and rode to the salt water wells of Tarentum, over 100 miles away, seeking a skilled driller of artesian wells, one who could supply the tools and who could complete a well of 1,000 feet deep, if necessary.

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

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

Risked Everything

From 1858 to the completion of the well, the total expenditures of The Seneca Oil Company, including Drake's salary, were only $1,989.58. Drake meanwhile had stretched his personal credit to the limit. In midsummer of 1859, he talked soberly to Ruel Fletcher and Peter Wilson, his good friends. Since the first of the year, the company had sent him only $500 for supplies and wages. His salary was unpaid. He was hundreds of dollars in debt to Fletcher for domestic supplies; he owed Wilson for drugs and medicine. The New Haven people resolutely refused to advance further funds. But he had no thought of quitting.

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

The promoters came running when the well became a sensational success. They didn't waste time in praising their hired man. Largely, they ignored him. In March of the following year, they demanded Drake's resignation. Fletcher and Wilson had difficulty and delay in getting their money back. No one associated with the venture made money directly from it. The Seneca Oil Company was liquidated in 1864, and the property was eventually sold for non-payment of taxes, a matter of $4.37.

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

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

name and his cash. Shortly thereafter, the company failed and Drake was destitute again.

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

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

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

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

* * *

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

As the pioneer oil man, he was neither a demi-god nor a fool. He established a pattern of tenacity for the industry he launched, a tradition of integrity, a record which the industry can proudly and sincerely acclaim. In 90 years, the oil industry has grown to a maturity pretty largely by a practical application of the principles that were inherent in the character of its founder.

Shortly after Colonel Drake brought in the first commercial oil well, the Pennsylvania countryside was dotted with derricks, and a thriving commerce in oil-laden barges sprang up

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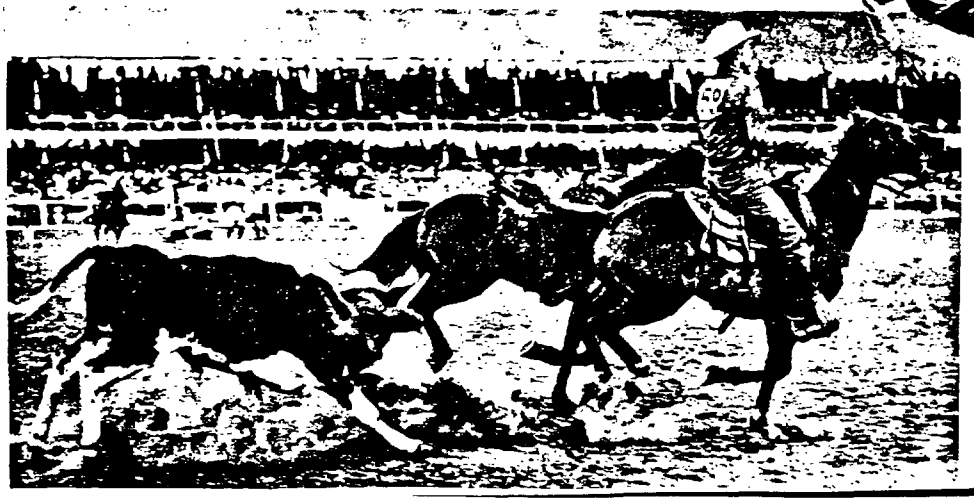
Parades, Indians and rodeo events all punctuate each year's celebration. This year, an Army helicopter was used to contrast modes of travel available now and in the old days

The big event during Frontier Week is the rodeo. Below, a contestant tangles with an ornery steer, while at the right, a rider and horse part company



ETC 24147

CHEYENNE FRONTIER DAYS

The thrilling days of the Old West are relived as the city of Cheyenne stages a bang-up celebration each year

FOR 360 DAYS A YEAR, Cheyenne leads the quiet, dignified life of almost any American city. But on those other five days, the Wyoming capital cuts loose with a show that, for fun and excitement, rivals New Year's Eve in Times Square or an American Legion convention.

The big event is the annual Cheyenne Frontier Days, which traditionally is held during the last full week in July. Then, an estimated 100,000 Wyoming residents and tourists pour into Cheyenne to relive the romantic, devil-may-care days of yore. Attired in cowboy duds, they roam the streets that once quaked beneath the boots of famous cowboys and desperadoes.

The heart of the celebration is the rodeo, which has grown from a brief, impromptu presentation in 1897 into "the daddy of 'em all." Today, because of the number of contestants and nationwide interest, five full afternoons of competition are needed. During those afternoons, the nation's top rodeo contestants ride wild broncos and Brahma bulls, bulldog steers, rope calves and steers on the dead run, race on blindfolded horses, and thrill onlookers with their trick and fancy riding.

No one in the audience is ever mystified by the goings on – thanks to a running commentary by the master of ceremonies. For the last 25 years, that role has been ably filled by Cheyenne-born Ed Storey, who is the principal Wyoming sales representative of Standard Oil of Indiana.

Other features – parades, entertainment, merriment – enliven the Cheyenne celebration. One of them is the annual party sponsored by Frontier Refining Co. for its distributors, jobbers, dealers and other guests. The company, with a refinery in Cheyenne, shares a civic interest in the Frontier Days celebration, and entertains its associates and friends at an old-fashioned picnic and barbecue, followed by an afternoon at the rodeo.

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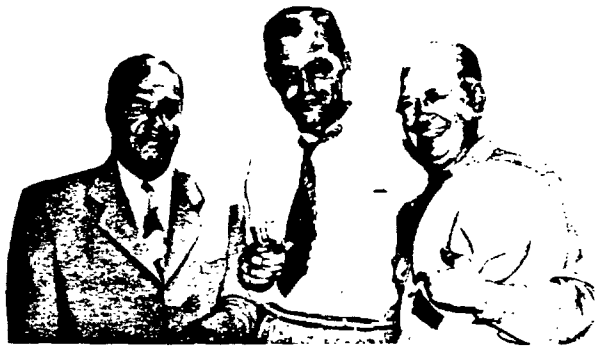

In the absence of M. H. Robineau, president of Frontier Refining – who was called to Washington to attend a National Petroleum Council meeting – H. E. Armitage (left) and Claude Weber (right), the company's vice president and sales manager, greeted Frontier Refining's guests. In the center is R. A. Douglass, of Ethyl

Frontier Refining sponsors an annual picnic for its associates and friends during Cheyenne Frontier Days, followed by an afternoon at the rodeo. Below are some of its guests at the rodeo; at the right is a view of its picnic

THE PROMISES SALESMEN LIVE BY

Trade-marks play an important role in the sales and distribution of the products of American enterprise

IF YOU THINK about any of the most familiar products in the United States today, the chances are you will automatically see in your "mind's eye" a well-known trade-mark.

Firms manufacturing everything from abacuses to zithers have used distinctive emblems for years, of course, but today the trade-mark is playing a more important part than ever in the sales and distribution of the products of American enterprise. It has become one of our strongest and most useful instruments for the buying public in the exercise of their "freedom of choice," which is the heart of the competitive system of business.

Familiar symbols like the Dutch girl on a can of scouring powder, the bus company's racing greyhound, the sleepy lad with the tire and the candle used by the Fisk Rubber Co., and the Metro-Goldwyn-Mayer lion are of inestimable value. So are thousands of other trade-marks, known and readily recognized by millions of consumers every day.

Since the United States Patent Office recorded its first trade-mark, a total of some 511,500 insignia had been credited to their respective owners by late June of this year. Many of these emblems have long since been forgotten and are of little or no value, but there are a few dozen trade-marks worth millions, including some that have demonstrated their cash register qualities in actual transactions.

The Value of Trade-Marks

A famous coffee trade-mark, for example, once changed hands for $25 million. A well-known razor brand was sold for $24 million, and a tobacco company agreed to pay $2¼ million annually for 99 years for the right to use four familiar cigarette trade names.

What gives a trade-mark its value? Why is the right to use one name or design worth millions, and the same right to another name or design be of little or no value?

Surely it isn't the artistic merit involved. Many of the most valuable trade-marks were created years ago, according to the tastes and standards of earlier times. The Smith Brothers – "Trade" and "Mark" – would scarcely win a beauty prize or an award in an art competition today. Yet anyone who might want to buy the right to use their bewhiskered faces had better be prepared to write a check that would look like an item in the national budget.

Nor does the value of a trade-mark seem to lie entirely in its cleverness, although certainly a few of them have caught on because of their deft approach. The Bon Ami Company's familiar chuck that "Hasn't Scratched Yet" is neatly associated with the advertised properties of the product, and the Chesapeake and Ohio Railroad's comfortably snoozing "Chessie" is perhaps unique in sleeper travel promotion.

But for every clever device and

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slogan there are scores of others equally well known – consisting simply of the maker's name, or bold type enclosed in a square, circle, triangle or some other shape. No one will dispute the familiarity of the American Tobacco Co.'s trade-marks for Lucky Strike cigarettes, of the Shell Oil Co.'s scallop, or of the Gillette Safety Razor Co.'s elongated diamond.

Ethyl Corporation owns and uses two such marks – the trade-mark "Ethyl" and the emblem with "Ethyl" on a black triangle with yellow rays. Certainly, this emblem cannot be considered either the best in commercial art or in advertising appeal, yet it ranks among the best-known and most widely recognized emblems in the country.

Many Surveys Made

Advertising agencies, merchandising experts, authorities in sales promotion and others professionally interested in the whys and wherefores of trade-marks have carefully investigated the reasons for a recognized emblem's appeal. Their surveys clearly point to the fact that a trade-mark's value lies in what it means to the public. In other words, the value of a trade-mark, if any, lies in the minds of millions of people, scrambled with all the other ideas imbedded in the grey matter there. Whenever the public promptly identifies a given product by its individual trade-mark, and associates certain values with the emblem, the trade-mark takes on its full meaning.

In the case of the familiar "Ethyl" trade-marks, motorists of course associate them in their minds with high quality motor fuel containing "Ethyl" antiknock compound.

Since the war, for example, groups of investigators have completed five surveys in cooperation with individual oil companies. Over 16,000 car owners throughout the East, Middle West and South were shown pictures of three gasoline pumps looking like those which might be found in service stations supplied by these refiners. One pump was marked as a premium pump with the "Ethyl" trade-mark and emblem, one was shown as a premium pump without the "Ethyl" trade-mark and emblem, and the third was a picture of a regular gasoline pump.

The car owners were asked the questions, among others, "From which of these pumps would you expect to get the highest quality gasoline. . . ?" A total of 12,900 of them, or 76.5% pointed to the pump with the "Ethyl" trade-mark. Of those who picked the "Ethyl" pump, more than three out of four voluntarily said they chose it "because of the 'Ethyl' sign," or "because it's 'Ethyl'."

People first used a trade-mark as an easy way to pin the blame on somebody if products were not up to scratch. In ancient Babylon, brick-makers were obliged by law to identify their own wares by individual hieroglyphics, so that if the bricks cracked or crumbled, the makers could be flogged or even put to death.

Civil War Impetus

In this country, the Civil War did a lot for the development of trade-marks which stood for quality goods in the public mind. Early deliveries of shoes for Union troops included too many with paper soles, and so the government began to require a label or symbol on every pair ordered, clearly showing the manufacturer's name. After the war, returning soldiers naturally bought civilian shoes from those manufacturers whose trade-marks had been on the best military footgear. Producers of a wide variety of goods soon took similar means to identify their products.

The public today still goes back to the original core of the trade-mark idea when it looks for a familiar insignia before buying something. It wants to know who made the product. Giving the public that information through a trade-mark has become an accepted part of the sales techniques of business and industry everywhere, and part of the purchasing habits of the American consumer. As every retailer knows, where other factors are equal, goods identified with brand names or trade-marks outsell the "unknowns" nine times out of ten.

Deeper Meaning

The very fact that a company identifies itself with the goods or services it sells, however, is only the beginning of the story. Especially in this country, the public looks at a trade-mark as a symbol of high quality, dependability and full value, although technically and legally the insignia stands only as an identification of the maker.

This broad attitude of the consumer toward trade-marks did not come about by accident. He has learned through experience that a company, by identifying itself with a product, is prepared to take full responsibility for guaranteeing quality. He has come to know that a trade-mark is a company's promise – its word of honor – the kind of word he can depend on.

Trade-marks have therefore become firmly associated in the public mind in two closely related ways – for high standards in goods and services, and for the integrity of the companies behind them. The consumer has learned by experience that he can accept without question the integrity of the promise behind a

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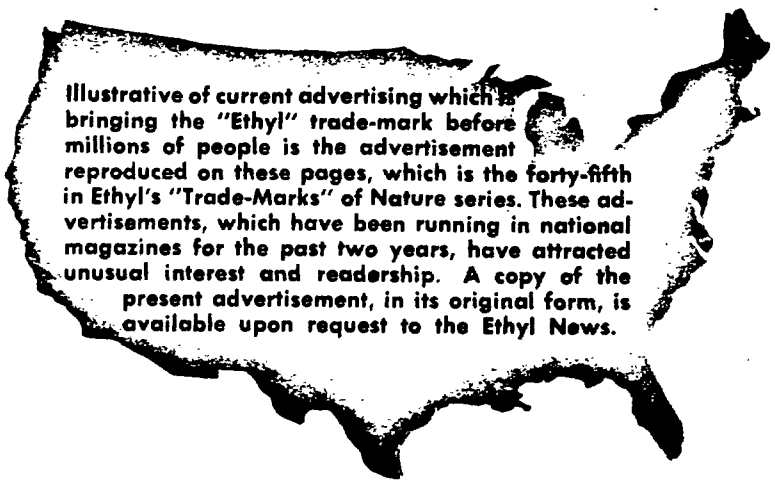
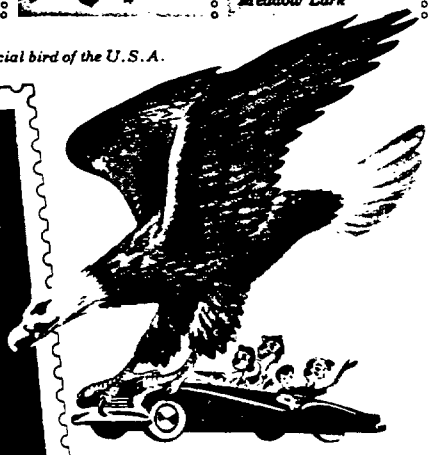
"TRADE-MARKS" OF NATURE



Illustrative of current advertising which is bringing the "Ethyl" trade-mark before millions of people is the advertisement reproduced on these pages, which is the forty-fifth in Ethyl's "Trade-Marks" of Nature series. These advertisements, which have been running in national magazines for the past two years, have attracted unusual interest and readership. A copy of the present advertisement, in its original form, is available upon request to the Ethyl News.

ETC 24151

BALD EAGLE—*official bird of the U.S.A.*



When touring, watch for

THESE "TRADE-MARKS" OF NATURE

They are our State birds*

When you buy gasoline

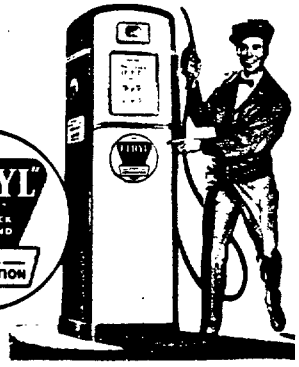
THE TRADE-MARK "ETHYL"

Identifies gasoline stepped up with "Ethyl" antiknock fluid

For top-flight performance...

for better, smoother, more powerful driving in every State of the Union . . .

ask for "Ethyl" gasoline—high quality gasoline improved with "Ethyl" antiknock fluid, the famous ingredient that steps up power and performance.



* Based on information obtained from individual state governments. † Unofficial ‡ Bill now in legislature. Bird drawings by Don Eckelberry, illustrator of The Audubon Bird Guide.

"ETHYL" ANTIKNOCK COMPOUND — ETHYL CORPORATION

"Ethyl" antiknock fluid is made by ETHYL CORPORATION, *Chrysler Building, New York 17, New York*

ETC 24152

trade-mark like General Electric's "GE" monogram or Johnson & Johnson's red cross.

It's always a long haul, however, before a company can make a new trade-mark a familiar one, and before the public associates broad values with the symbol.

The "Ethyl" trade-marks, like many others, were introduced to a limited public. Not long after the first gallon of gasoline containing "Ethyl" antiknock compound was sold in Dayton, Ohio, in 1923, the first "Ethyl" emblems began to appear on a few service station pumps in the Middle West. The trade-marks gained a sales story to help them up the ladder of popular recognition when the first three cars to finish in the 1924 Memorial Day race in Indianapolis used gasoline containing "Ethyl" antiknock fluid.

Gained in Popularity

Soon, demonstrators toured the country, and banners and posters with the trade-mark flanked speakers' platforms whenever Ethyl salesmen spoke, and whenever county fair exhibits were set up. The public not only learned about what "Ethyl" antiknock compound could do for gasoline, but it associated these qualities with the "Ethyl" trade-marks appearing on increasing numbers of service station pumps from coast to coast and from border to border.

At the same time, Ethyl Corporation used a number of means to broaden public understanding and appreciation of its trade-marks. Modern sales promotion methods, national advertising, displays and the use of other media to focus attention on "Ethyl" and the yellow and black emblem have been an established policy of the company since the product was first marketed nationally by progressive refiners.

All this takes time and money, as anyone who has ever tried to establish a familiar trade-mark knows very well.

Ethyl Corporation and its customer oil companies have invested at least $100 million since 1925 in advertising associated with the "Ethyl" trade-marks and in their widespread use on service station pumps. The current series of Ethyl Corporation advertisements on "Trade-marks of Nature" (see Page 16) is another step in this direction, with the result that these advertisements – as a series – rank among the five best read in magazines of national circulation.

The very fact that "Ethyl" and the black and yellow insignia are now the most generally known and most widely accepted trade-marks in the petroleum industry suggests the extent to which they can work for an oil company.

Whenever there is an "Ethyl" trade-mark on a pump bearing a recognized refiner's identifying insignia, the retailer and the refiner have two trade-marks working for them instead of one, and the "Ethyl" value in the public mind supplements the merit of the individual oil company's own good name and identification. A number of companies have discovered how this combination gives impetus to sales.

Supplemental Value

General Motors, to cite one of the best examples, uses the well-known Fisher Body trade-mark as an added inducement to its customers. Manufacturers and retailers of steel kitchenware have found that the U. S. Steel insignia helps move utensils faster, even when they are also clearly stamped with the manufacturer's own trade-mark. Goodyear's wingfoot on rubber heels has proved its usefulness in supplementing the trade-marks of reputable shoe firms.

Once an emblem has reached the point when the consumer accepts it as a mark of quality, the owners usually exert every effort to maintain public confidence in the symbol. Some firms have even modernized their emblem to indicate progress the way the White Rock Mineral Springs Co. turned an 1893 Greek goddess into a much more winsome sprite leaning over a pool.

Product Improvement

By and large, however, a majority of companies without any such pictorial problem have counted on steady improvement of the product itself to become associated with what the trade-mark stands for. Socony-Vacuum's "Flying Red Horse," for example, certainly represents a great deal more today than when the trade-mark was introduced some 15 years ago, and the crest identifying the Cadillac automobile is obviously associated with a much different car than it was years ago. The gasoline consumer and the automobile purchaser naturally expect 1949 standards from these respected trade-marks – and get them.

The same considerations hold true for the antiknock compound and the premium gasolines sold under the "Ethyl" emblem.

A trade-mark can be, therefore, a living and growing thing. It has value as a residual thought or esteem in the minds of people who may purchase things so marked by the maker. The public, ever changing, ever dying, ever being reborn, knows at any one time which trade-marks have led to satisfaction or dissatisfaction in the past — and which it is going to look for in the future. Maybe that is one reason why they are called *trade*-marks!

ETC 24153

CONSULTANT TO THE FARMER

The farm equipment retailer plays a key role in American agriculture — helping farmers to realize all of the benefits of modern farming methods

IF HE DOES THE EXPECTED, the American farmer this year will invest more than $1.5 billion in new farm machinery and equipment to help him produce what promises to be a record crop. For that sum, he will receive something like 600,000 tractors plus sizable quantities of the planting, harvesting and other mechanical farmhands that modern ingenuity has placed at his disposal.

But, following the credo of the dealers who will sell him this vast array of mechanization, the farmer will not be purchasing individual pieces of equipment as such. Instead, he will be buying relief from farm drudgery, lower farm operating costs and increased farm production, more leisure time, and greater opportunity to raise his standard of living to a still higher plane.

Paul M. Mulliken, managing director of the National Retail Farm Equipment Association, which represents the majority of the nation's retail dealers

More and more, the nation's farm equipment retailers are leading the way in merchandising, not the product but rather the results of using that product. They don't sell tractors — they sell farm work done easier and better at the right time and with individual independence all the way from crop bed preparation through harvesting. They don't sell gasoline engines — they sell more dependable labor-saving power on the farm. They don't sell combines — they sell speed and efficiency in harvesting, the facilities for handling a wide variety of crops, and less need for outside labor.

This marketing precept is part of the transition the retailer has undergone since the manufacture of farm equipment first became a business about a century ago. In the early days, he was a hardware merchant or blacksmith to whom the sale of farm machinery, which amounted to a few tools developed for animal power, was a sideline. Now, he is a specialist whose major interest is in seeing that farmers have the machine tools of agriculture, and that this equipment remains in good repair until it has lived out its usefulness.

Full-Fledged Service

But more than that, the farm equipment retailer of 1949 is a "consulting engineer" to the farmer. He thoroughly understands the function of every piece of equipment he handles, and is able to interpret that purpose in terms of its fullest economical and efficient use. He also knows the petroleum requirements of the equipment. He is familiar, too, with the soil and terrain of all farms in his trading area, which

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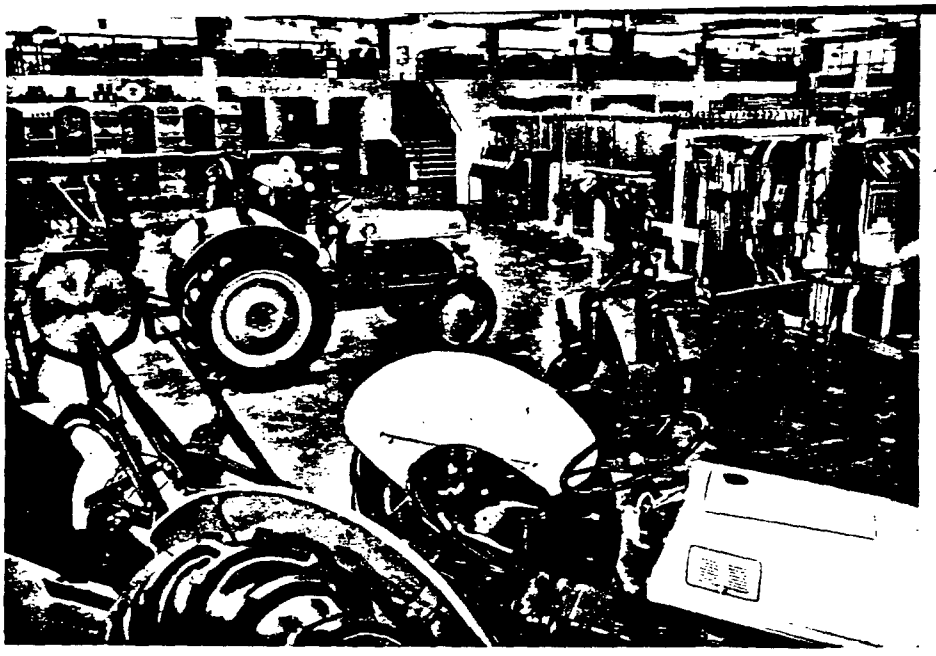

Today's modern farm equipment dealerships are completely equipped to serve the farmer in every way

means that he can consult intelligently with individual farmers about their machinery and equipment needs for the crops most suited to their land. And chances are the dealer is well versed in soil conservation and nutrition practices, and thus is able to give farmers practical advice about these vital matters.

Respected by Farmers

As with the county farm agent or extension director, the farm equipment dealer is a respected man in his community. Farmers consult freely with the former about crop conditions, soil matters and the like. Similarly, they turn to the farm equipment retailer for advice about the machinery, implements, and countless miscellaneous items they require.

All this is a far cry from the situation that prevailed a century, even a generation, ago. The first farm equipment dealers—the hardware store men and the blacksmiths—came into being with general acceptance of the steel plow, which had been invented in 1837. Their places were logical outlets for the new farm tools that were beginning to find their way to market. The average hardware store already had a large farm following through its sale of shovels, hoes, pitchforks, and other farming tools. The smithy was equally as well known among farmers. He had shod their horses and helped them build the crude instruments then used on the farm.

Service – now such an integral part of the dealers' responsibility to the farmer – was not in the vocabulary of the old-time hardware merchant and blacksmith, so far as tractors and power implements were concerned. The farmer bought his equipment over the counter, much as he did a keg of nails or a hammer, and drove away with it. No one bothered to explain how he should use his new purchase to the best advantage.

Such remained the system generally until farm mechanization came on the scene during and after World War I. The tractor – a cumbersome forerunner of the modern high compression tractor – had been developed right after the turn of the century, but it wasn't until the American farmer was called upon to produce to the utmost for a nation at war that it came into general usage. Later, despite the agricultural depression of the times, power farming and mechanization came into its own in the early 1920's.

Retailing Came of Age

No longer could farm machinery and equipment be considered an incidental phase of a hardware store's merchandising. It was now a business in itself.

Manufacturers began to contract with men who would specialize in selling those things that the farmer needed to complete his chores. As these dealerships grew and prospered, they added more and more specialized equipment to their line. The result is that today, the farmer can buy virtually everything he needs for actual farming operation under one roof, and that includes such varied items as air compressors, insecticides, oils and greases, and tires.

Much of the credit for the success of the retailer in his new role as "consulting engineer to agriculture" is due the National Retail Farm Equipment Association, to which all but 3,000 of the nation's 22,000 retailers belong. This na-

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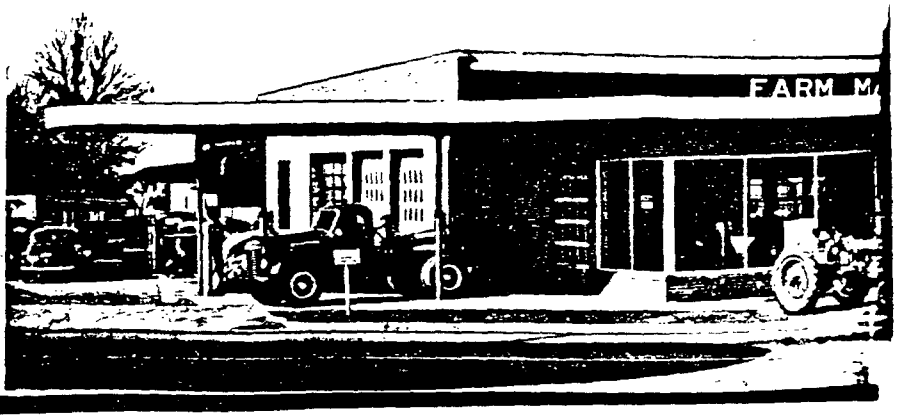
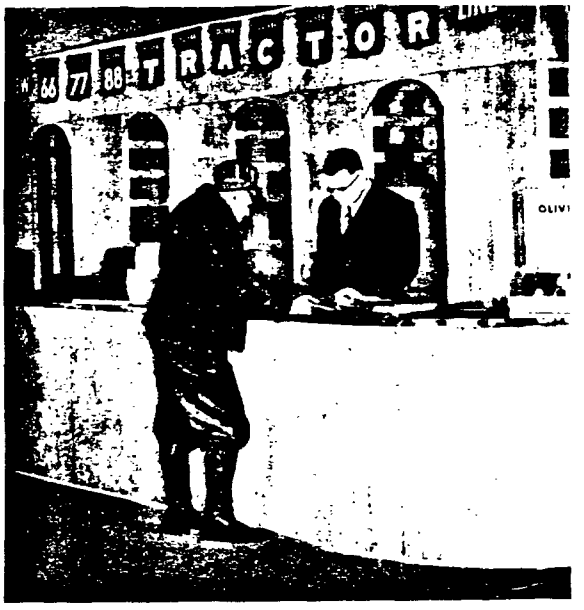


tional trade organization, which is the successor of a group formed in the Midwest in the days of horse-drawn farm equipment, will hold its Golden Jubilee national convention in Washington, D. C., from October 17 to 20.

Acting in cooperation with all farm machinery manufacturers, the various governmental agencies concerned with agriculture, and with 34 state dealers' organizations, the National Retail Farm Equipment Association has constantly encouraged retailers to increase their usefulness to the farmers they serve.

One result of this effort has been to bring the farm dealer establishment off the back streets and side alleys and onto the main street or highway of town. The typical farm machinery retail outlet today is a cheery, spacious building of which approximately 40% is usually devoted to a repair shop, 30% to the display room, 20% to the stocking of parts, and 10% to office space. Its total floor space and working personnel, of course, depend upon its location and volume of business. One dealer in California employs 78 mechanics alone to keep farm machinery in good operating condition. Other dealers need only three or four employes, all told. The national average for farm machinery retail outlets is about 10 employes.

You'll find none of these establishments on Fifth Avenue, Market Street, Woodward Avenue, or Wilshire Boulevard. But in the nation's 9,000 agricultural trading centers — villages, county seats, small towns — the farm equipment dealer is an important and necessary member of the community.



In serving farmers, the equipment dealer is more than simply a merchant. He also gives them year-round repair, maintenance and consultation service

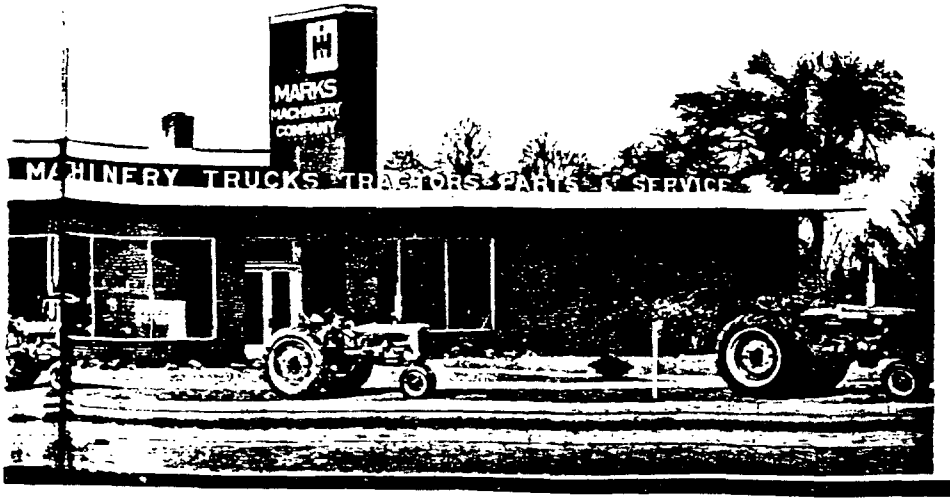
Service is the keystone of these dealerships, and you can't serve the farmer if you're not near him. Figures give some idea of the part these retailers play in a town's commercial life. In a Texas town of 500, a farm equipment dealership does a $350,000 annual business. That's also the volume of a dealer in a northern Indiana community, which has a population of only 200. In an Illinois village with a population of 600, one dealer's yearly gross is $500,000.

In exchange for the farmers' dollars, the retailer offers not only the world's best made and most modern farm machinery and equipment, but also year-round repair, maintenance and consulting services.

Trained for Their Careers

Many of the younger members of farm machinery retail establishments are particularly well equipped to discuss the farmer's problems with him. As agricultural engineering graduates of our nation's agricultural colleges and universities, they have made a special study of matters which vitally concern farmers. Part of the course, too, has been devoted to the selling and servicing of farm machinery.

Currently, one of the most pressing problems confronting farmers — and the nation as a whole — is soil conservation. The 19,000 retailers who are members of the National Retail Farm Equipment Association



Once upon a time, the village blacksmith or hardware man sold farming tools as a sideline. Today, the farm equipment dealership is an integral part of the farming community

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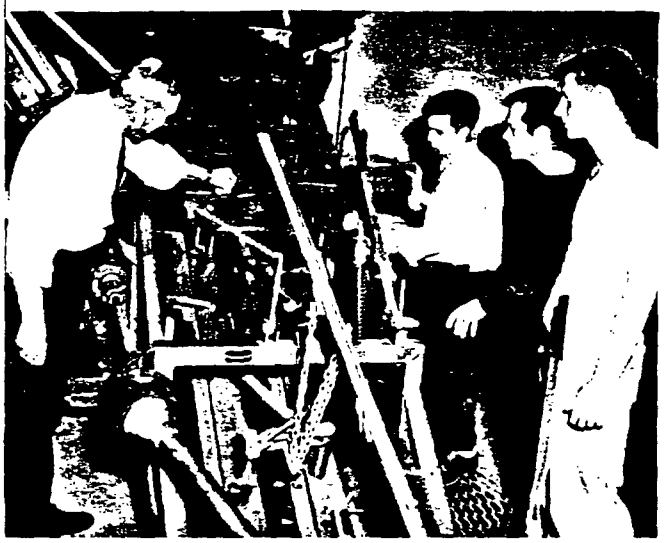

More and more of the younger members of the farm equipment retailing profession are being recruited from colleges and universities where they have specialized in agricultural engineering and related subjects

are playing a leading role in helping to overcome the excessive waste of our cropland by erosion. In cooperation with the Soil Conservation Service, they are using every means of educating farmers to the need for better land management which includes terracing, contour farming, grass planting, replacing deficient trace minerals, conserving water, and rotating crops.

Urge United Efforts Now

Both the farm machinery manufacturers and the retailers have been actively engaged in trying to save our soil and our resources for several years, of course. But the NRFEA and the Farm Equipment Institute, the latter the manufacturers' organization, feel that the time has come for united efforts on the part of all.

Statistics tell the unhappy story. Annually, wind and water erosion blow and wash away the equivalent of 5,000 one-hundred acre farms. Or, as one manufacturer said it in an advertisement, "America Shrank 500,000 Acres Last Year." Thus far, some 100 million acres of once-productive farmland have been rendered immediately useless by erosion. It's easy to grasp the significance of that fact when you remember that the 1948 wheat crop, largest on record, grew on less than 72 million acres.

By taking home to the farmer such sobering facts as these, and by showing him how he can prevent the needless disappearance of more acres through the proper use of equipment he already has, the nation's farm machinery retailers form the front-line troops in the war on erosion. As one of the leading farm machinery dealer publications recently stated, "Farm machinery manufacturers and other industries can furnish the educational material and financial support for this national soil conservation effort, but like selling tractors and plows – the job of selling the nation's farmers can best be done by farm equipment retailers."

Working hand-in-hand with the farmer on the solution of problems of mutual concern is no new assignment for the farm equipment retailer. He does it every day by counseling them on the proper use of farm machinery so that they can increase the "mass production" of their land to feed not only America but much of the rest of the world, too. He did it during the war by keeping the farmers' then $6 billion investment in farm equipment in repair when parts and new machinery were in short supply. He has done it for the past quarter-century, ever since farm machinery retailing, as today we know it, came into existence.

By showing the farmer how to select and use his mechanized farm equipment wisely, and by considering the farmers' problems his problems as well, the farm equipment retailer has played no small part in making the American farm family the happiest and most prosperous of any country in the world.

Equipment dealers are helping farmers in their task of soil conservation through the application of modern farming methods

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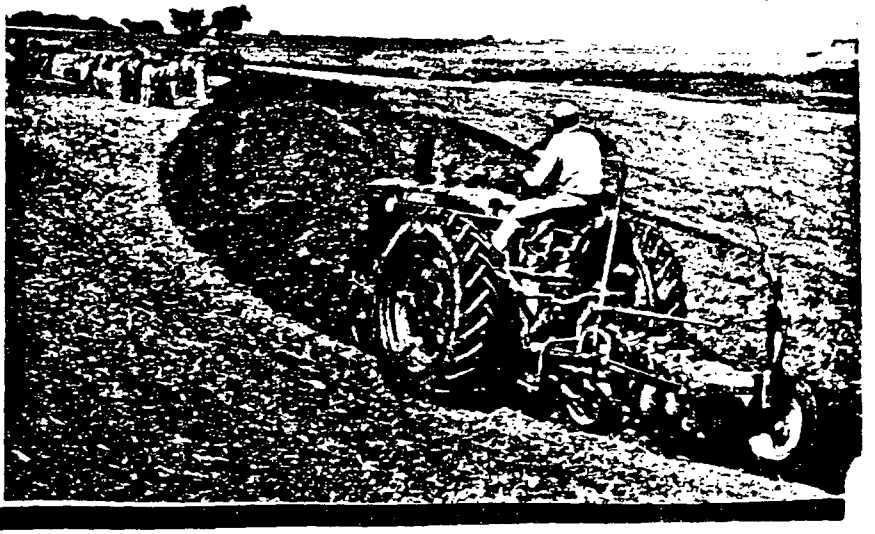

ANTIKNOCK REQUIREMENTS of COMMERCIAL VEHICLES

EDITOR'S NOTE: *The following paper was presented before the National West Coast Meeting of the Society of Automotive Engineers, held in Portland, Oregon, on August 15 to 17. The paper is based upon a survey of the antiknock requirements of commercial vehicles which was conducted jointly by the Shell Oil Company, the Socony-Vacuum Oil Company, and Ethyl Corporation. Portions of the paper are reprinted as a matter of interest to our readers.*

By J. A. Edgar, Senior Technologist, Martinez Laboratories, Shell Oil Co.; H. J. Gibson, Research Coordinator, Ethyl Corp.; R. J. Greenshields, Director of Research, Wood River Research Laboratories, Shell Oil Co.; and G. W. Pusack, Senior Technologist, Socony-Vacuum Laboratories (a Division of Socony-Vacuum Oil Co., Inc.).

WHILE MANY SURVEYS of the antiknock requirements of passenger cars have been reported during the last 15 years, very little information has been available on the requirements of commercial vehicles. The commercial-vehicle market consumes approximately 25% of the motor gasoline sold in the United States, with trucks in heavy-duty operation using about 11% and buses about 2%, and farm trucks and light trucks using the remainder. With the trend to more sensitive* gasolines and to passenger-car engines which tend to rate fuels at the Research octane number level, it becomes increasingly important to know whether truck and bus engines use sensitive fuels to advantage.

Two factors which have tended to discourage accumulation of antiknock requirement data on commercial vehicles have been the large amount of work involved and the difficulty in securing adequate coverage of makes and sizes in any one locality. A study of the subject indicated that a survey should include at least 100 vehicles, selected to cover the major producers and the many sizes and types of engines used in the greatest volume. It also seemed desirable to select vehicles in use in various sections of the country in order that the cross-section of vehicles and data should be as representative as possible. These considerations dictated that work should be carried out on a cooperative basis; hence in late 1947 the companies which the authors represent agreed to conduct a cooperative survey during 1948. This paper presents the results of the cooperative test work, which involved development of a test procedure and determination of the requirement of 102 commercial vehicles, using several different types of reference fuels, and three commercial-type gasolines.

Survey Objectives

A number of objectives were outlined when the joint program was planned. The cooperating laboratories wished to know the requirement of commercial vehicles in terms of the usual blends of isooctane and n-heptane, and particularly how these requirements compared with antiknock requirements of passenger cars. They wished to determine how well commercial-type motor gasolines satisfied commercial vehicles and how well blends of sensitive, pure hydrocarbon, reference materials reflected the performance of the commercial-type fuels used. In addition they wished to determine how well igni-

* *For the purposes of this paper, a sensitive fuel is defined as one having a Research octane number considerably higher than its Motor rating. (Sensitivity equals Research O.N. minus Motor O.N.).*

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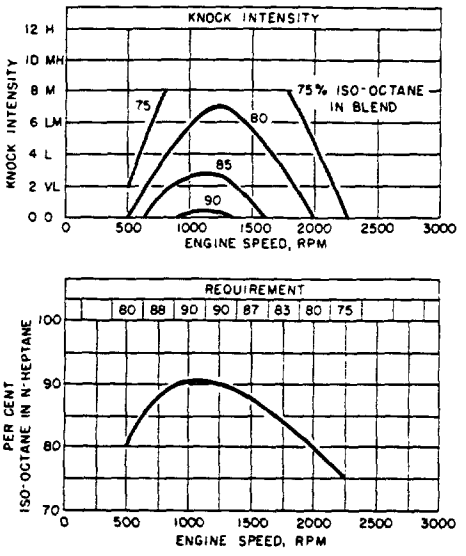

FIG. 1
KNOCK INTENSITY AND OCTANE NUMBER REQUIREMENT
Reference Fuels: Iso-Octane and N-Heptane.

tion system characteristics conformed to factory specifications, and the effect on antiknock requirement caused by adjustment of ignition systems to standard.

Development of Test Procedure

Although the participants had experimented individually, there was no accepted procedure for obtaining the fuel requirements of engines installed in commercial vehicles. General noise level, high engine loading, engine location, and other factors introduce problems which are quite different from those in passenger cars. Late in 1947, therefore, representatives of the cooperating companies assembled to develop test techniques which would:

A. Give a reliable indication of the antiknock requirements of the working engine over the speed range.

B. Be applicable to use in any section of the country.

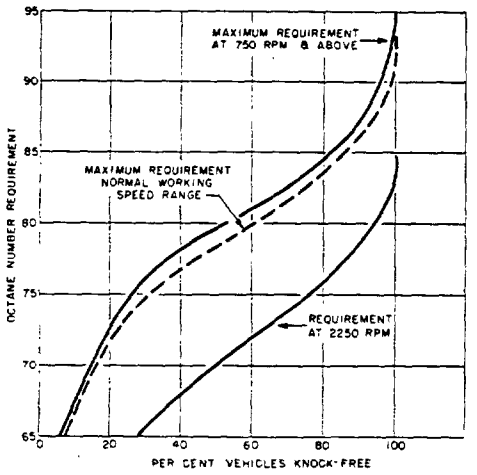

FIG. 2
OCTANE NUMBER REQUIREMENT OF COMMERCIAL VEHICLES
Reference Fuels: Iso-Octane and N-Heptane. Vehicles in "As-Found" condition.

Test Procedure

The test procedure used for the work was essentially similar to the CRC E-1-748 Research technique for determination of octane number requirements of vehicles on the road. Buses were tested in high gear (vehicles with torque converters were tested in direct drive). Trucks were tested with the gear ratio selected to give a full-throttle engine acceleration from 500 to 2,000 rpm in 20 to 40 seconds. A trailer or other load was optional.

Curves of knock intensity versus engine speed were plotted with particular attention to the speeds at which knock came in and died out. A sample set of curves is shown in Fig. 1. The requirement at any speed was determined from the curves, using knock-free operation as the criterion.

Selection of Test Vehicles

Since all makes and models of commercial-vehicle engines could not be tested within an approximate total of 100 vehicles, those engines used in greatest volume were listed for test work. Each participant then volunteered to obtain data on certain engines in order that coverage of the selected group should be as complete as possible. The 102 vehicles tested were obtained in the general regions of New York, Boston, Albany, Philadelphia, Cincinnati, St. Louis, San Bernardino, and San Francisco. The following makes and models of engines were tested: Autocar, Chevrolet, Continental, Dodge, Fageol, Ford 6, Ford V-8, General Motors, Hall-Scott, International, Mack, and White.

Twenty-two of these engines were in buses and the remainder were in trucks or trailer tractors. The buses were from both city and intercity operation, while the trucks and trailer tractors were from tank, van, light panel, utility, dump, and pick-up operations.

Test Program

Each of the cooperating laboratories carried out test work with their own test crews, using the jointly developed procedure. Evaluation of the requirements of each engine involved observation of knock intensity over the speed range for 20 to 25 fuel blends. Altogether this program involved an estimated 600 man-days for completion, and resulted in about 600 curves of requirement versus engine speed.

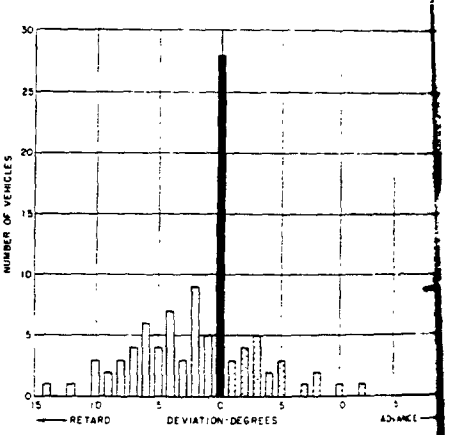

FIG. 3
DEVIATION OF IGNITION TIMING FROM MANUFACTURER'S RECOMMENDED SETTING

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The mass of data accumulated was so large that no attempt has been made to present it in detail. Analysis has been made on three different bases, each of which is indicative of antiknock requirements under a different set of conditions.

A. *Maximum Antiknock Requirement at 750 rpm or Above*

This analysis permits comparison with passenger car data obtained on the same basis and represents the maximum requirement under nearly any operating conditions.

B. *Maximum Antiknock Requirement in the Normal Working Range*

This is the maximum requirement of each vehicle within the estimated normal working speed range. The normal working range was selected after careful observation of engine speeds in the fleets in which these vehicles were used.

C. *Antiknock Requirement at Engine Speed of 2250 rpm*

All of these analyses are based on knock-free operation as determined by trained laboratory observers. It is recognized that a higher level of knock is tolerated sometimes in trucks having high noise levels coming from road, transmission, and exhaust sources and in buses having engines located remotely from the driver. This higher level of knock results in a lower effective requirement to the operator than was determined by the laboratory observers using a knock-free level. Data obtained at higher knock intensities are presented to aid in estimating the lower effective requirement.

Primary Reference Fuel Requirements

Fig. 2 summarizes the data obtained on all vehicles in the as-found condition. The data are presented as distribution curves of octane number versus percentage of vehicles knock-free.

Effect of Ignition Timing

A matter of particular interest was the degree, and effect on requirement, of deviations of ignition timing from recommended settings. As was indicated earlier in the paper, each vehicle was tested in the as-found condition, and again after the ignition system had been restored to manufacturer's specifications either by adjustment of distributor components or by installation of new distributors purchased from local dealers. It should be emphasized that ignition-system adjustment on a distributor tester did not always mean that ignition timing in the engine was correct at all speeds, or in all cylinders. It has been demonstrated many times that wear, normal lash, torsional effects, etc., can cause severe variation in actual ignition timing even with a distributor which meets all specifications.

Ignition Timing Deviations

Fig. 3 shows the deviations of ignition timing from recommended specifications for the 102 vehicles tested, measured from the static or idle setting recommended by the manufacturer. Of the group, 49 were within a ± 2 degree range of the recommended setting, while 37 were retarded and 16 were advanced more than this amount. Maximum over-advance was 20 degrees, while maximum retard was 14 degrees. In some instances this was not as bad as it appears, since deviations in distributor advance curves helped to compensate for deviations in initial settings; in others, however, the two effects were additive.

Fig. 4 shows the effect of ignition system adjustments on the requirement level and range among vehicles of the same make and model where four or more engines of a given model were tested. In three of the makes the spread was quite small before adjustment and showed

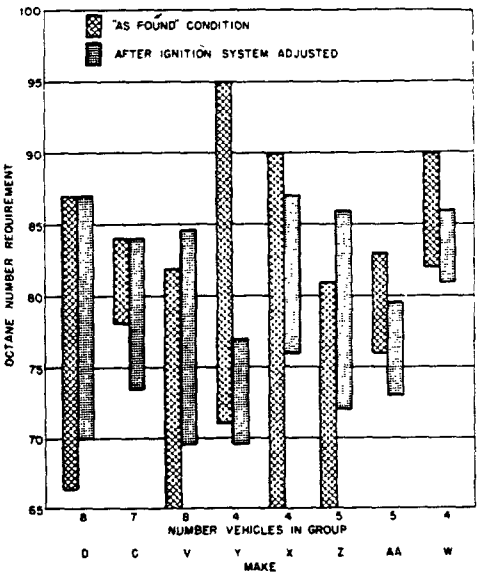

FIG. 4

RANGE IN OCTANE NUMBER REQUIREMENT AMONG ENGINES OF SAME MAKE AND MODEL

Maximum Requirement at 750 RPM and Above.

Reference Fuels: Iso-Octane and N-Heptane.

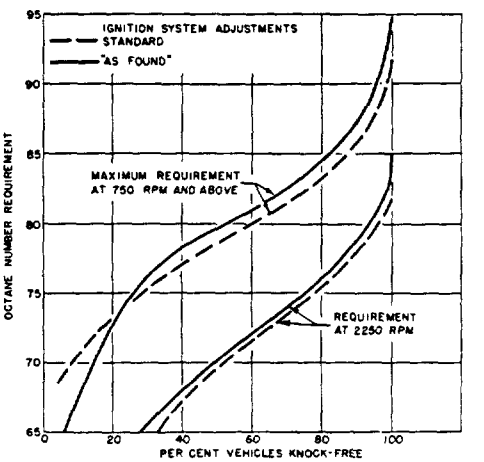

FIG. 5

EFFECT OF IGNITION SYSTEM ADJUSTMENTS ON OCTANE NUMBER REQUIREMENT

Reference Fuels: Iso-Octane and N-Heptane.

little change while five makes show improvement by adjustment of ignition-system components. It will be observed that only in Make C was the range increased by ignition-system adjustment, while the reduction was striking in Makes X and Y. When it is considered that this improvement was accomplished by the single operation of distributor maintenance, the gain is striking.

The over-all effect of ignition-system adjustment on the distribution of maximum requirements is shown in Fig. 5. Although large benefits were obtained in some vehicles by distributor maintenance, the general level of requirements for all vehicles was not changed greatly by adjustment of the ignition systems to specification.

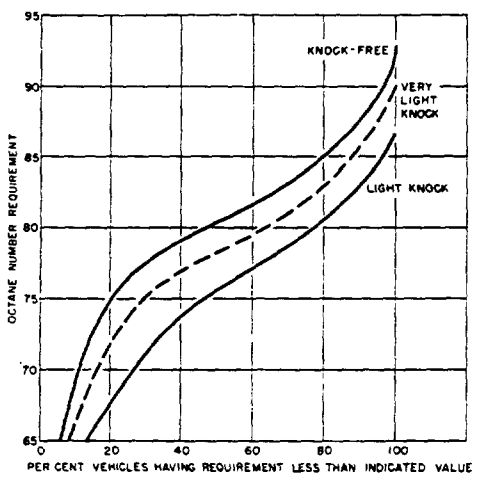

FIG. 6

EFFECT OF KNOCK INTENSITY CRITERIA ON OCTANE NUMBER REQUIREMENT

Maximum Requirement at 750 RPM and Above.

Reference Fuels: Iso-Octane and N-Heptane. Vehicles in "As-Found" condition.

Effect of Knock Intensity

All of the data so far reported have been based on knock-free operation as recorded by trained observers. This level is the most reproducible for test work. The engineers conducting the survey noted in many instances that the professional drivers of the equipment considered the engine knock-free even though knock intensities as high as "light" (see Fig. 1) were audible to the observer. The data were analyzed to determine the effect of knock intensity on the requirement level of the vehicle. Fig. 6 shows the effect of operation at levels of knock-free, very light, and light knock on the apparent requirement level of the 102 vehicles. The difference between knock-free and light-knock operation was approximately five octane units, while very light knock was midway between the two, *i.e.*, about 2½ units lower than knock-free.

This observation should not be construed to mean that the authors recommend vehicle operation under detonating conditions to reduce the fuel requirement. This is a matter that the individual fleet operator must decide on the basis of his own operation and maintenance experience.

Comparison with Passenger Cars

One of the principal reasons for this survey was to compare the requirements of commercial vehicles and passenger cars. Fig. 7 presents distribution curves summarizing the results of the 1948 CRC survey of 265 passenger cars, independently conducted surveys totalling 359 cars, and the data obtained in this commercial-vehicle survey. Both surveys are presented on a knock-free basis and with the vehicles in the as-found condition. It will be noted that the difference in maximum requirements of passenger cars and commercial vehicles is small, being only about two octane units over most of the requirement range. At 2250 rpm the difference in the CRC and commercial-vehicle survey is larger, with the passenger cars showing somewhat higher requirements at all percentages of vehicles knock-free.

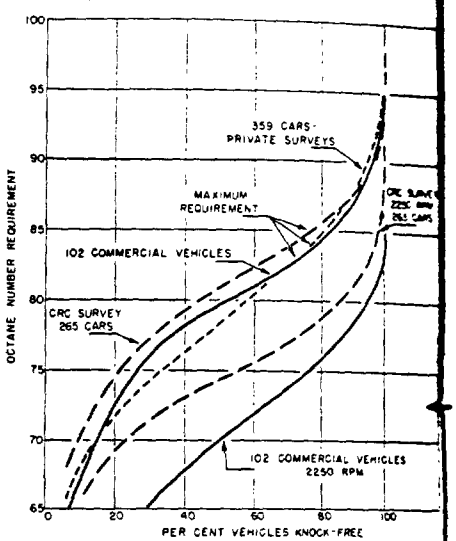

FIG. 7

OCTANE NUMBER REQUIREMENT DISTRIBUTION OF COMMERCIAL VEHICLES AND PASSENGER CARS

Passenger car data from 1948 CRC survey and 1947-48 surveys conducted independently by Shell, Socony-Vacuum and Ethyl Corporation.

Reference Fuels: Iso-Octane and N-Heptane.

Vehicles in "As Found" condition.

Commercial Fuel Requirements

The data so far reported have been based only on blends of the primary fuels, iso-octane and n-heptane. While these data are useful, it is necessary to have background data on commercial-type fuels to interpret the results. As was previously indicated, three commercial-type fuels were tested in all vehicles. Each fuel was run in the same manner as the reference fuel blend, and its ability to provide knock-free operation was thus determined. The results are presented and related to the performance of blends of iso-octane and n-heptane in Fig. 8. The curve of maximum requirement is the same

as that used in previous figures. Research and Motor octane numbers are shown for each of the three commercial-type fuels, with the laboratory ratings for a given fuel connected by a vertical line. The ratings are plotted, and the line drawn, at the percentage of vehicles knock-free on the commercial-type fuel. The intersection of the vertical line with the requirement curve gives the road octane number of the commercial type fuel, since the same number of vehicles were knock-free on the commercial type fuels and the reference fuel blend corresponding to the point of intersection. The road octane number has been designated by a third point on the vertical line. It is possible then to relate the three vertical points for any fuel and to obtain the relative weighting of Motor and Research ratings required to indicate the Road octane number of the fuel. Table I shows octane numbers for the three fuels on the basis of ability to satisfy maximum requirements of the vehicles.

No equation is given for RE-41A because of the low percentage of vehicles in which it provided knock-free operation. Equations for the other two fuels compare well with that developed for passenger cars, *i.e.*, Road Octane Number = 0.54 Research + 0.46 Motor (1).

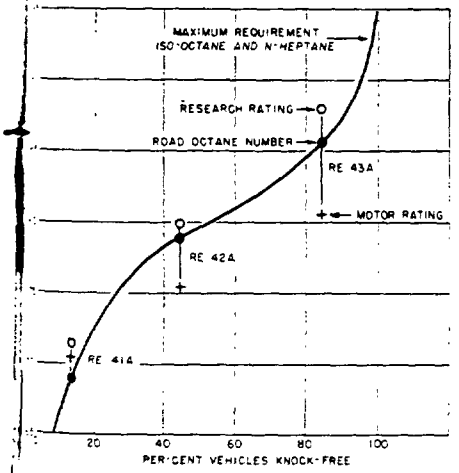

FIG. 8

RATINGS OF COMMERCIAL-TYPE FUELS ON MAXIMUM REQUIREMENT BASIS

Commercial vehicles in "As Found" condition.

TABLE I

FUEL	OCTANE NUMBER RESEARCH	MOTOR	ROAD	CORRELATION EQUATION (1)
RE-41A	71.5	70.5	69.0	——
RE-42A	80.0	75.5	78.5	0.7 Research + 0.3 Motor
RE-43A	88.0	80.5	85.5	0.7 Research + 0.3 Motor

Engine Severity

It is recognized that no wholly satisfactory method for expressing engine severity has been established. For the purposes of this discussion, an engine which rates fuels at or near the Motor octane number level is considered to be severe, while one which rates at the Research level is considered to be mild. The data on the 102 commercial vehicles, using diisobutylene and n-heptane as sensitive reference fuels, give the following correlation equations:

RPM	CORRELATION EQUATION
750	0.8 Research + 0.2 Motor
1500	0.4 Research + 0.6 Motor
2250	0.0 Research + 1.0 Motor

At low engine speeds the commercial vehicles rate fuels near to the Research level (0.8 Research + 0.2 Motor), and therefore are considered mild. In contrast, at 2250 rpm the engines are severe, rating the fuels at the Motor level (0.0 Research + 1.0 Motor). An interesting comparison with passenger-car engines is provided by tests conducted in 28 cars, which had the same average maximum requirement as the 102 commercial vehicles. Correlation equations for these cars were:

RPM	CORRELATION EQUATION
750	0.8 Research + 0.2 Motor
1500	0.7 Research + 0.3 Motor
2250	0.2 Research + 0.8 Motor

At the low engine speeds the two types of engine are equally mild, while at the higher speeds the commercial engines are more severe. It is apparent, however, that when the tendency to rate fuels lower is combined with the lower requirements of the commercial engines at the higher speeds, it may be concluded that sensitive fuels which satisfy passenger cars will also satisfy commercial vehicles.

Conclusion

This paper presents a road test procedure for use by engine manufacturers and petroleum research laboratories for evaluating the requirements of commercial vehicles. The procedure is reproducible, not unduly burdensome, and gives a reliable indication of the fuel requirements of the engines in service.

The maximum antiknock requirements of commercial vehicles and passenger cars are nearly identical on the basis of knock-free operation with the wide variety of fuels tested. In general, fuels which satisfy passenger cars will also satisfy commercial vehicles.

Attention to the ignition-system components will reduce the large variation of antiknock requirement among engines of the same make and model.

(1) *"A Proposed Road Octane Number" by Messrs. Watson, Caudel, and Heldman, presented at the SAE National Fuels and Lubricants Meeting, Tulsa, November 1948.*

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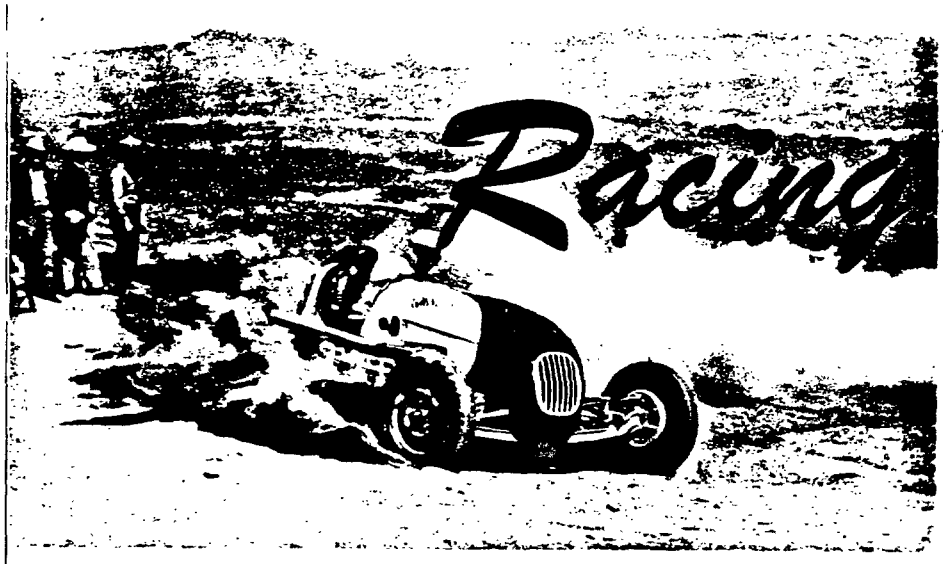

Racing at its

ZEBULON PIKE may have been an explorer of note, but he does not rank as a prophet.

Back in 1806, when he discovered the towering Colorado peak that now bears his name, Zebulon confidently inscribed in his diary that no one would ever scale the heights of Pikes Peak. He himself had tried it, got lost, and was forced to labor on to what is now Colorado Springs.

But where Lt. Pike failed, millions of vacationists, nature lovers, and thrill-seekers have succeeded. During the past 30-odd years, Pikes Peak has been climbed by people in automobiles, motorcycles, and the cog railroad that glides its way up the side of the incline. Some have even walked up it, and others have done it on burro.

Not the most conventional, but certainly the fastest and most spectacular, way to ascend the peak is by racing car. Next Labor Day, as on all Labor Days back to 1920 save for the recent war years, these vehicles will have the right-of-way on the unique highway that leads to the summit of "America's most famous mountain." For, Labor Day is Pikes Peak Hill Climb day—a day when men and racing machines pit their respective skill and power against the treachery and deception of 12½ miles of the most rugged natural racing course to be found anywhere.

Speed, stamina, skill, and suspense are the ingredients of a contest such as this, and the Colorado hill climb has them all. But more than that, it is a scientifically planned race.

Streamlined racers with powerful engines in the 11 to 1 compression ratio range snake their way up the serpentine gravel road in close to 15 minutes. For the 12½-mile course, that figures out to an average of 50 mph. It's not very fast as racing times go. But on a highway that is practically devoid of any straightaway—and is upgrade 94% of the way—it borders on the ultimate.

Yet, the expectation of a new record each year draws out the nation's crack hill climb drivers.

Presently, the record for the climb is 15 minutes 28.7 seconds. Lou Unser established that standard three years ago in a supercharged Italian Maserati. He will be among those

Left, the record for the climb is close to 15 minutes, or about 50 mph for 12½ miles of uphill curves that demand top-notch skill

ETC 24163

Peak

This Labor Day racing cars will again zig-zag their way up the side of Pikes Peak in a dare-devil race against time

trying to better that mark this September 5. The 53-year-old Unser and existing records are as incompatible as fire and water. Behind the wheel of both American creations and the foreign Maseratis he has won eight of the last ten races and on five of those occasions wrote a new record into the books.

Until the stock cars vanished from the Labor Day competition 15 years ago, the Pikes Peak hill climb was of considerable import to the automotive industry as a critical test for engines and engine parts. Developing satisfactory carburetion, cooling, ignition and spark plugs for the pull up a highway such as this is quite a problem. The course rises vertically 6,700 feet to a point more than 14,100 feet above sea level. The average grade is 7%, but some grades are 10% or more and these comprise 38% of the total course. The maximum curve is 146 degrees.

Several factors account for the absence of stock car competition from Pikes Peak. One reason is that the hill climb provided data on only one specialized—and extreme—driving condition, whereas passenger cars today must be designed to operate over a wide variety of conditions. Second, the effort by car makers to improve engine performance and durability is a continuous one. Consequently, all manufacturers now have their own proving grounds, engineering laboratories, and other facilities for conducting vehicle research the year-round, instead of on the once-a-year basis afforded by the Pikes Peak and other great racing events.

Some companies associated with the automotive industry do, however, maintain an active interest in the Labor Day doings. For example, the Perfect Circle Corp., the Champion Spark Plug Co., the Firestone Tire and Rubber Co., and the Socony-Vacuum Oil Co., offer cash prizes as well as technical assistance. The prize money offered by these companies, plus the cash put up by the Pikes Peak Hill Climb Association, make the race worth more than $7,000 to the winner.

That is pretty good pay for less than 20 minutes' work, but the winner and all other contestants really earn their money.

They would earn it even if they did nothing more than just drive the race. But for most drivers that is the grand climax. Behind them is a long period of personal training and of nursing their cars into shape. Almost every day for weeks before the race the drivers tour the Pikes Peak highway in passenger cars to memorize the scores of twists, turns, and switch-backs that will bedevil them on race day.

Ten o'clock is the zero hour on Labor Day morn. This is the moment everyone has been waiting for. The drivers, even those who know Pikes Peak like a book, are tense and taut. So, too, are the 20,000 or so spectators. Many of them have been camped on the mountainside since the day before, fighting off rain and winds, to hold on to their choice viewing spots. Come what may, no Pikes Peak climb is ever postponed because of the weather.

The pits hum with the usual last-minute excitement of the track. Cars are checked for proper lubrication and adequate fuel supply. Two or three gallons of gasoline are needed for the climb, and it must be properly balanced fuel from the volatility standpoint. The gasoline must be volatile enough to afford rapid acceleration, and yet not so volatile that vapor lock occurs during the change in altitude as the cars climb more than 430 feet a minute. Each driver has his own special blend of

From left to right in the strip above: Off to a flying start on one of the few straightaways, Al Rogers, former winner, starts his climb . . . The race is against time, and this driver (center) is skidding around a turn . . . At the finish, an electric timer tells the split-second results

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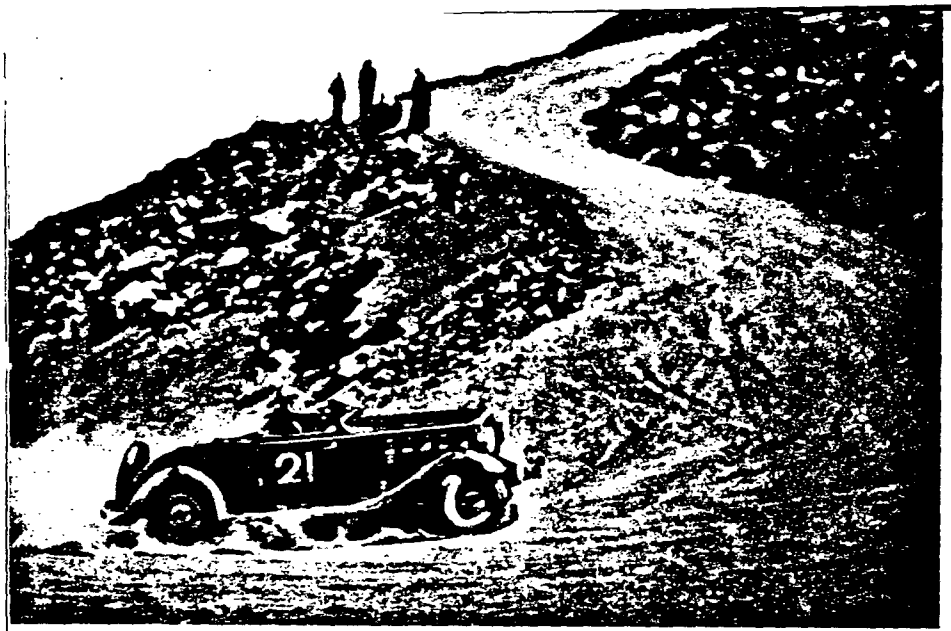


The last hill climbing event for stock cars was held in 1934 when fully equipped cars such as this one competed

fuel, varying mostly in its tetraethyl lead content. As a special service, an Ethyl Corporation field representative is at the race to advise drivers on fuels and the utilization of "Ethyl" antiknock compound in their blends.

The order in which the entrants take off up the hillside in their race against the clock already has been determined by a short qualifying run held a week before the race. There is advantage to being among the first to go up because the roadbed is not so "mussed up" by the skidding, swerving cars. The cars – a dozen or so in normal years – are under no weight restriction, but must meet certain piston displacement specifications. For supercharged engines, the maximum piston displacement allowable is 183.060 cubic inches. For non-supercharged power plants, it is 274.59 cubic inches. "Freak" cars and midget racers are banned.

Two hundred feet in back of the 7-mile Post, starting point of the hill climb, the first car is ready to take off on its running start. The vehicle flashes by the official's stand, working up its full power. A green flag falls. The race is on. Once a driver is given the flag, he is in competition. There can be no second start for him, no stopping on the hill to take on additional fuel or lubricants.

The cars are dispatched at five-minute intervals, which means that the racer just ahead is about one-third of the way to the top if all is going well. But everything doesn't always go well. The unsuspected inhabits every inch of the highway.

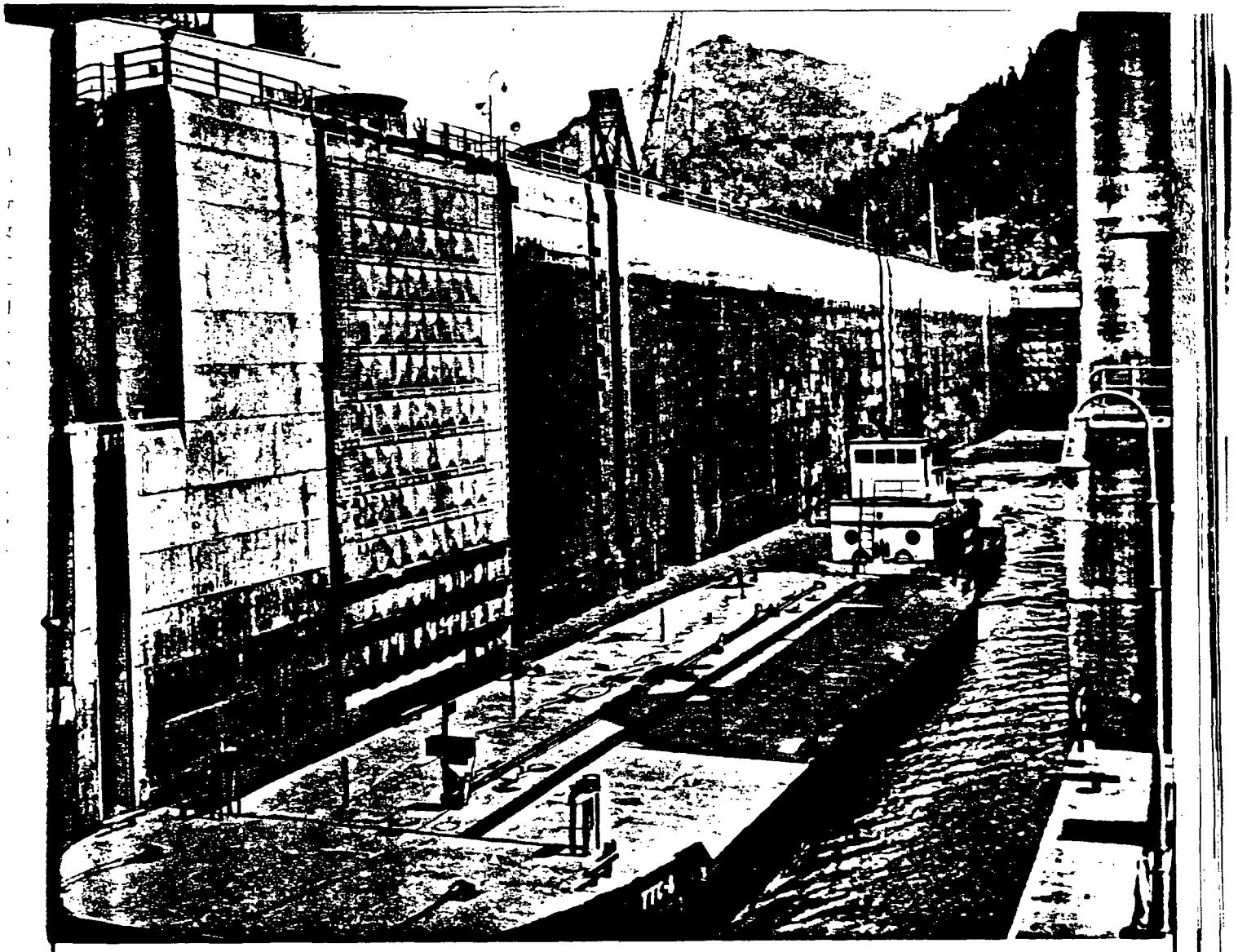
Ditches along the side of the 20-50-foot boulevard-type road have a habit of sucking in the wheels of a car. Motors, however perfectly engineered, sometimes conk out in the sudden change of climate and altitude. Clouds so dense that often a driver can't see the front of his car blanket the course. Faces sting from the sharp wind that whirls through the mammoth canyon. Men are temporarily blinded – first by the glaring sun and the next moment by drenching rain or swirling snow.

For a quarter-hour or more, it is a constant battle against the never-ending curves and turns. Timberline has faded from sight. Then suddenly, the goal appears in view. Ahead lies the snow-capped summit of Pikes Peak, an almost level stretch of land covering some 60 acres. The weather-beaten driver and car roar across the finish line, straining to the last for those valuable seconds that win this race. The thousands assembled at the summit and on down the mountainside eagerly await the announcement of the car's time. But to the driver this is almost unnecessary. He instinctively knows whether he was "fast" or "slow."

The final accounting comes when the car has completed its climb up the Peak. Times are compared and the winner proclaimed. For him there is a tidy bundle of cash, newspaper headlines, and AAA championship recognition. Chances are that the victorious driver is a Rocky Mountain native, and that this is his only major race of the year. Few out-of-state drivers choose to tackle Pikes Peak. The Coloradoans who do seem to be content to rest on their laurels from one year to the next.

As they do, they secretly enjoy a chuckle at the expense of Zebulon Pike and his prediction that this mighty mountain would never be conquered by humans.

OUR COVER: This breath-taking view of Pikes Peak illustrates why it is one of the scenic wonders of the U. S. On Labor Day Pikes Peak is the scene of an annual hill-climbing event described in the foregoing article. Kodachrome courtesy of the Pikes Peak Infomation Bureau. **OUR PICTURES**: Pages 8-11, Walter Hortens; Pages 12 (right center) and 13, Ralph Morgan, Denver, Colo.; Page 12 (left center and bottom), courtesy Denver Post; Page 19 (bottom), courtesy National Retail Farm Equipment Association; Page 20 (top), courtesy Farm Implement News; Page 22 (bottom), courtesy Farm Equipment Retailing; Pages 28-30, courtesy Pikes Peak Information Bureau. Third cover by Rus Arnold.



WHEN WATER AND OIL ARE GOOD MIXERS

Along with huge rafts of lumber and various other commodities, petroleum products make use of the Pacific Northwest's greatest waterway, the Columbia river. On an average, almost 70% of the cargo passing through these locks at Bonneville Dam consists of petroleum products—about half of which is gasoline.

Pictured above is a striking view of the navigation lock at Bonneville Dam as an oil barge happened to be passing through on its way downstream. The Bonneville Dam—located at the town of Bonneville, Ore.—is about 40 miles upstream from Vancouver, Wash., and only slightly more than that from Portland, Ore. Thus most river traffic going upstream must pass through these locks.

Although the locks can accommodate ocean-going vessels up to 8,000 tons, much of the traffic consists of barges. The downstream gate shown in the left foreground is 102 feet high and the upstream gate at the rear of the lock is 45 feet high. The lock itself is 76 feet wide, 500 feet long, with a depth of 24 feet over the lower sill at normal low water.

As a tug and its barges, in the downstream trip, enter the lock, the water level is at the point where the darkened area on the wall meets the light area. The rear (upstream) gate is then closed and the water in the lock emptied downstream. When the water level in the lock is equal to the downstream level, the downstream gate is opened and the tug and its barges are on their way again. This drop is usually between 50 and 70 feet, depending on river conditions, and it takes about 15 minutes.

Vessels going upstream follow the same procedure in reverse. While the gates and valves are electrically operated, no power is used for the actual raising or lowering of vessels other than that of natural water power.

Ever since the days of the pioneer, freight has moved up and down the Columbia river. And although modes of river travel have changed, the river is always a source of pride to the crews of these craft.

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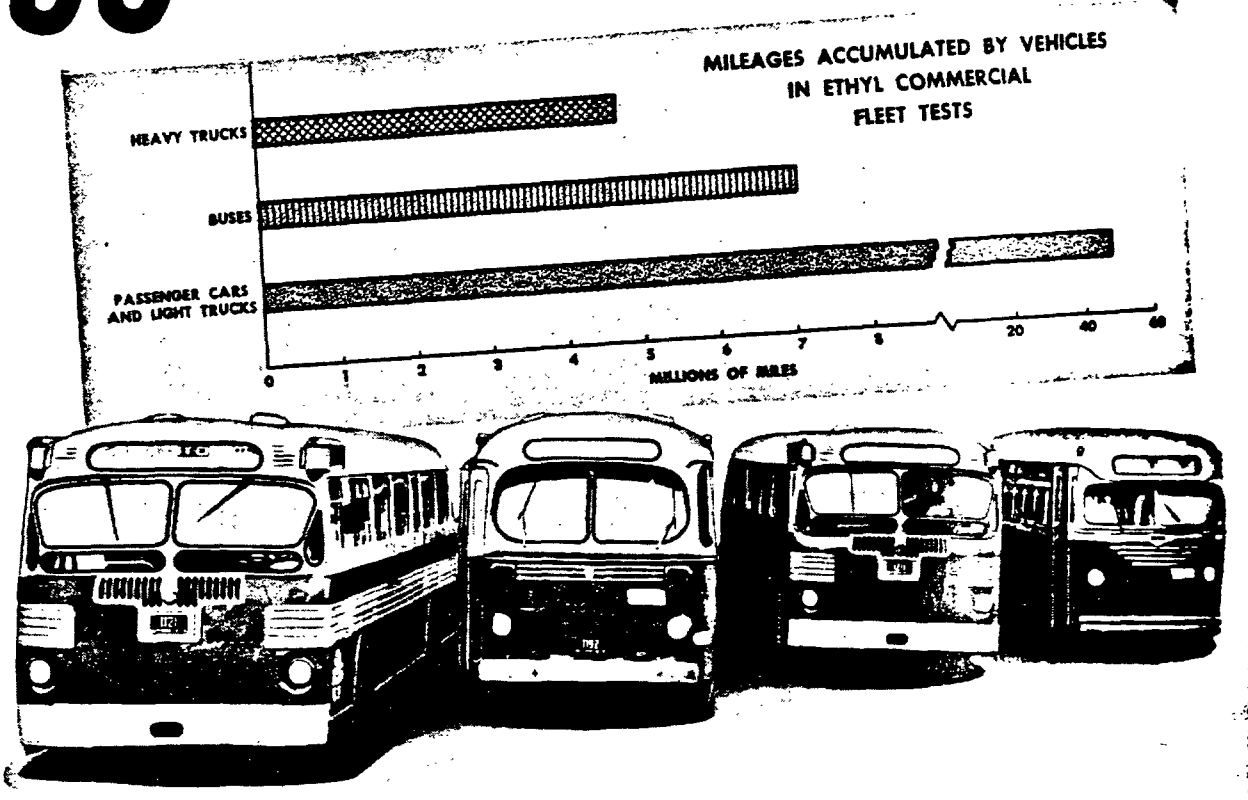
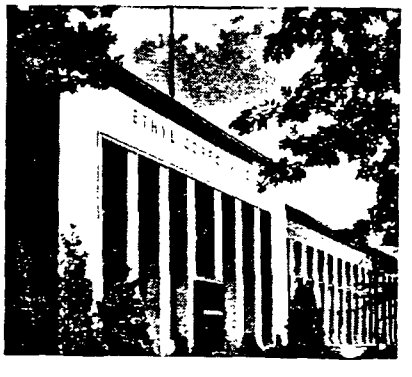
60 MILLION MILES OF FLEET RESEARCH



Cooperative tests, made possible by Ethyl's close relations with automotive companies and operators of commercial fleets, have provided information on more than 60,800,000 miles of road operation. Commercial fleet testing is the final step in Ethyl's extensive research program aimed at developing the best antiknock fluids for the oil industry.

Refiners benefit two ways

In addition to contributing to continually improved antiknock fluids, Ethyl's carefully controlled fleet programs provide refiners two major benefits:



1. **Basic information on the performance of different types of gasolines and oils operating under a wide range of service conditions . . .**

   thus refiners often find it possible to reduce the amount of expensive fleet research necessary to obtain similar basic data.

2. **A fund of information on improved maintenance practices which often point the way to more satisfactory use of petroleum products.**

Although the Laboratories each year conduct thousands of hours of research on single-cylinder engines, on full-scale engines connected to dynamometers, and on Ethyl-owned fleets of passenger cars and trucks at Detroit and San Bernardino, they have never been satisfied to accept the results of any one of these steps as the final answer in the development of "Ethyl" antiknock compounds.

How Ethyl fleet research is conducted

Ethyl commercial fleet tests are planned to be representative of the types and makes of vehicles in production, the variety of loading and operating schedules normally employed, and the weather and topographical conditions encountered in service in different parts of the country. Comprehensive control of each cooperative program is the responsibility of an experienced Ethyl engineer. He works out the details of the test with the management of the fleet and makes certain that procedures and controls provide reliable data . . . without introducing changes in the operation which would destroy the usefulness of the fleet as an index of commercial operation.

Since 1923—*continuous research to provide better antiknock service*

ETHYL CORPORATION

RESEARCH LABORATORIES

Detroit, Michigan, 1600 West Eight Mile Road • San Bernardino, California, 2600 Cajon Road

ETC 24167

ETHYL NEWS

ETC 24168

New secretary of the American Society for Testing Materials' Division on Combustion Characteristics is Hudson Kellogg, of Ethyl Corporation. This ASTM Division is responsible for the standardization, promulgation, and improvement of methods for determining the combustion characteristics of engine fuels. The ASTM Research, Motor and other knock-testing methods come under the jurisdiction of this Division.

Mr. Kellogg joined Ethyl Corporation 20 years ago at the gasoline testing laboratory in Yonkers. The following year, 1930, he transferred to Detroit as manager of the gasoline testing laboratory, and served for eight years in that capacity. In 1938, Mr. Kellogg returned to Yonkers, where he has held several important positions since.

He was manager of the Yonkers gasoline testing laboratory for three years until 1941, at which time he was named director of the knock-testing forums which Ethyl arranged for its customer oil companies throughout the United States and Canada. He later was appointed coordinator of Ethyl's five gasoline testing laboratories, and recently was named assistant manager of the Gasoline Testing Division.

Mr. Kellogg is a native of Pennsylvania, and studied mechanical engineering at Brooklyn Polytechnic Institute.

In addition to his new ASTM post, Mr. Kellogg also is active on many ASTM committees, and is a member of the Society of Automotive Engineers.

IN THE

ETHYL NEWS

OCTOBER 1949

PROGRESS REPORT 3

Oil Progress Week, which is being celebrated this month, has a deeper meaning than ever before. It marks not only the ninetieth consecutive year of oil progress. It also marks a year in which the industry has been of unmatched service and usefulness to the American public

MAKING IT HOT FOR FIRES 7

When firemen "go to blazes" they have at their disposal the most utilitarian fire fighting equipment ever devised. Not only are today's fire trucks more maneuverable, but they can swing into action at a fire in less than two minutes

THIS IS STILL NEW YORK 11

East side, west side, all around the town. . . . No matter where you go in Gotham, you'll find remnants of old-fashioned customs you'd never guess still existed in the nation's foremost city

GRADE A SERVICE 14

In a day, America consumes a veritable river of milk — and a mountain of other dairy products. It is the modern motor truck, almost exclusively, that transports this vast volume of basic food every step of the way, from farm to doorstep

JET EDUCTORS FOR HANDLING GASOLINE DYES 18

Gasoline dyes are highly useful, but their handling sometimes creates a housekeeping problem at various refineries. One way in which that problem is being met is through the use of an enclosed system

YOU CAN'T STAY LOST 20

Stockholders and other people of importance to business firms are among the million Americans who disappear every year. But once the experts go to work, few of these missing persons stay that way for long

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In order to widen the fields of reader interest in Ethyl News, we frequently publish articles contributed by writers not associated with Ethyl Corporation. Opinions expressed in signed articles are the authors'. The editors of the News welcome articles of timely interest submitted from outside sources.

Published by ETHYL CORPORATION, 405 Lexington Avenue, New York 17, N.Y.

Manufacturer of "Ethyl" antiknock compounds, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, secretary

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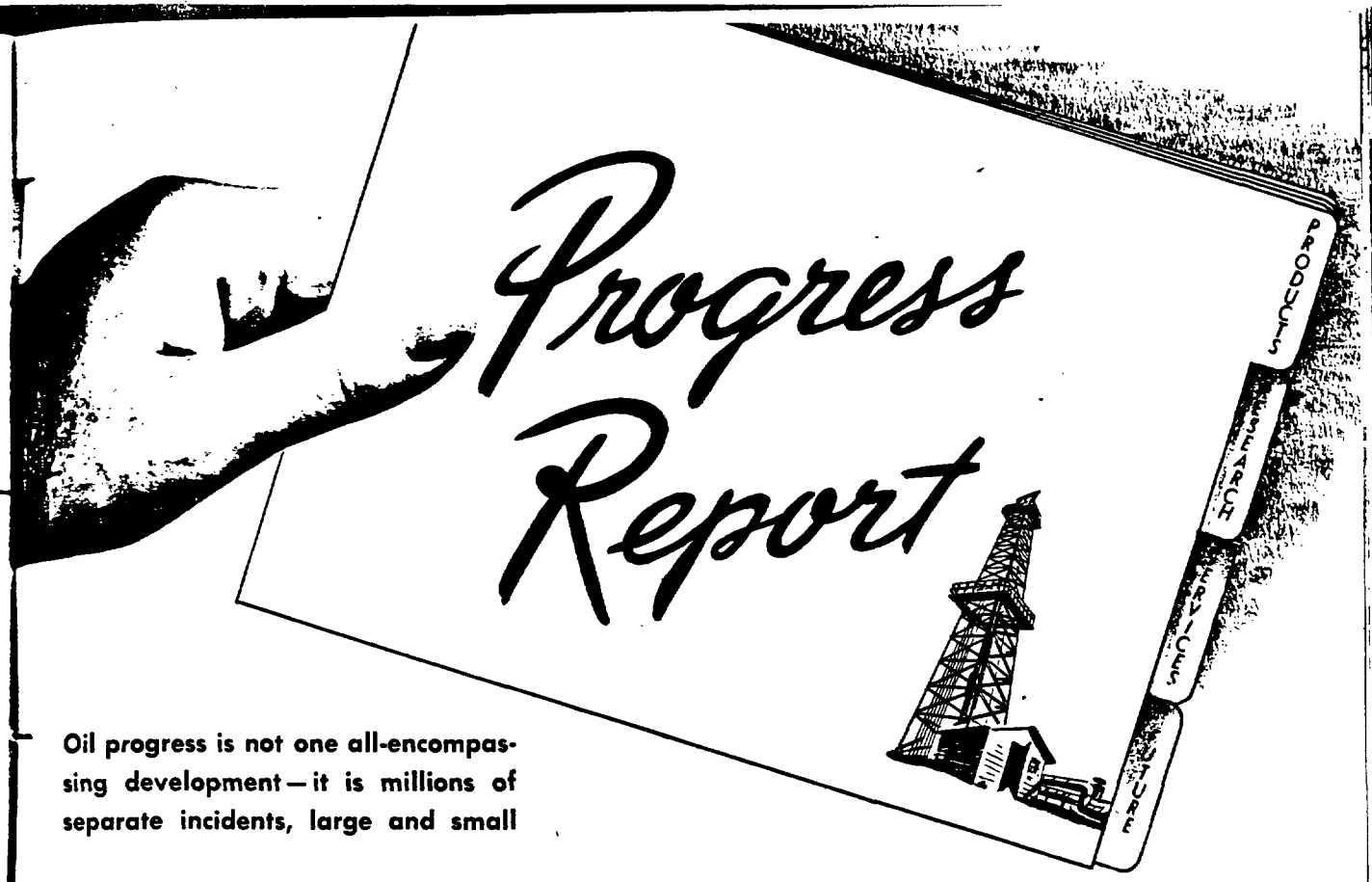


Progress Report

Oil progress is not one all-encompassing development—it is millions of separate incidents, large and small

On a lonely, sun-baked prairie miles from even a road much less a town, a sweat-stained drilling crew brings in a discovery well, laying the foundation for an assembly line in an automobile factory 30 years from now. . . .

* * *

Down the middle of a cornfield, a trench digger opens the ground for a "products" pipe-line—and tractor sales quotas for that farming state go up. . . .

* * *

At the edge of a typical American community, a new refinery goes on stream, and hundreds of new skilled jobs are created for years to come. . . .

* * *

In a research laboratory, a chemist uncovers a compound for use in gasoline, which engineers will incorporate in their plans for reciprocating engines years from now. . . .

* * *

Four vignettes of oil progress. They sketch some of the stimulus oil is giving to transportation, to agriculture, to social welfare, to national defense. It would take thousands of such instances to show how oil touches nearly every industry and every activity. Alone, each vignette gives only a glimpse of some daily function of oil or oil people. But piece all these sketches together into an integrated whole, and now look at the picture. You'll have a momentary scene in the unending progress that is oil, in a panorama whose each succeeding episode adds new strength and substance to American civilization.

Major Sources of Energy

Indeed, oil's usefulness has reached such dimensions that petroleum and natural gas today account for virtually half the entire energy consumed in the United States.

It is easy to paint the story of oil progress against the broad canvas of events. People can appreciate its significance, too, when they hear about some of the great moments in history—like the story of the 13 octane numbers that won the Battle of Britain. But progress isn't always spectacular and dramatic. It is often quiet and unobtrusive and even unnoticed. People thrill to the announcements of new discoveries and inventions; little do they know of the months and years of patient research work that went on before. Sometimes, then, the full story of progress emerges only when you examine closely the millions of incidents, humdrum as well as spectacular, of which progress is compounded.

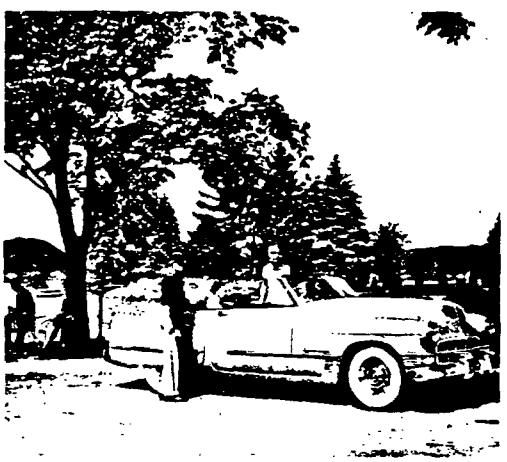
For example, the past year was one of oil progress, just as every year before it brought new gains through the widening applications of oil. There were few spectacular developments in the year. Nevertheless, the steady march of oil progress was felt by 150 million people in 150 million ways.

A motorist buys a new model car

ETC 24170

You could talk about oil's progress this past year in terms of production, refining, research. Or you could talk about it in terms of people, and what oil means to them today...

To millions of families, oil progress means efficient heat



Oil progress has enabled the introduction of advanced car models, and has brought modern fuels to even the remotest areas

for himself and his family. His purchase is only one of four or five million – yet to that motorist his new car represents a tremendous improvement over the old, bringing him the matchless combination of modern fuels and modern engines. . . . A farmer buys a new tractor. He is only one of several million tractor-owning farmers, but his new tractor will help him to do more work in less time, and do it more efficiently and economically than ever before. . . . A railroad puts a big new Diesel engine into cross-country service. That engine is just another statistic in the record books – just one of 6,000 other swift and powerful units like it. But that railroad knows that its modern Diesel, using the energy of oil efficiently, will haul passengers and freight at a big saving in cost over older coal- and oil-burning locomotives.

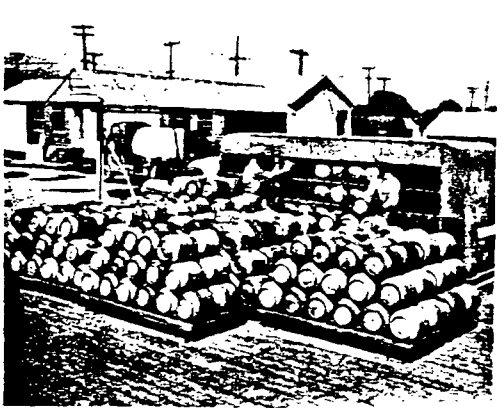
Oil progress, then, is not simply one all-encompassing development. It is an unending series of big and little things, of isolated incidents, that bring new benefits and comforts and enjoyment to everyone they touch.

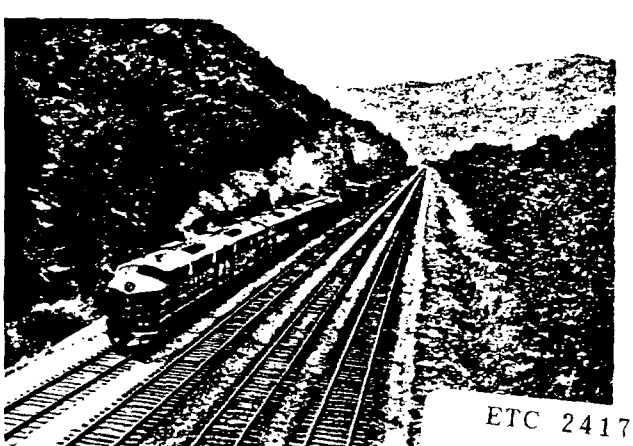
Motorists as a whole benefited from oil's progress in the past year.

They enjoyed the best in gasoline quality that the oil industry could offer — and all the advantages that go along with it. Not only were they benefiting from the generally better road performance that has been built into postwar fuels; they were enjoying the cream of all the improvements that have been achieved through the years. As a result of the gains in fuel economy attained over the last three decades, they saved easily a billion dollars on their fuel bill last year than would otherwise have been the case. And they were meanwhile getting more efficient and dependable transportation than ever before.

Automobile dealers, too, shared in oil's progress. Reflecting the better quality fuels which are becoming available – and the ability of the automobile industry to utilize these fuels to best advantage – the average dealer could offer his customers new cars with the highest compression ratio engines on record. Not simply that, but these improved fuels enabled several car manufacturers to introduce advanced engines that may point the way for engine design for years to come.

Oil progress is visible in the growing number of Diesel engines in service, which are bringing new gains in efficiency to the nation's railroads





ETC 24171

One manufacturer, for instance, was able to produce an engine, 200 pounds lighter than its immediate predecessor, which offered an average gain of 15% in fuel economy over the speed range.

Home owners profited from oil progress in the past year. Against the situation of the previous winter – when skyrocketing demand threatened to run away with then-available production – domestic users had all the fuel oil they needed this past winter. And for its part, the oil industry, at the start of this year, not only was supplying the needs for close to four million homes, but was gearing its operations to handle additional oil burner installations which are coming along by the hundreds of thousands.

The farmer's stake in oil progress is visible in the 3.1 million farm tractors now in use which are more than double the pre-war total. Powered by modern fuels, these tractors have brought about an industrial revolution on the farm, helping the farmer to turn out the greatest volume of food, feed and fiber in history. And, heightening these gains, as the tractor population has gone up, the horse and mule population has gone down – freeing some 55 million acres, once devoted to animal feed, for the production of human foodstuffs.

As can be seen from these scattered examples, oil progress in the past year has touched every person in every walk of life and every line of human activity. You could see it in the giant airliners that have reduced the world's proportions to a matter of hours. You could sense it in the nation's highway transportation system, daily carrying its mammoth load of goods and people. You could hear it in the throbbing engines of industry. You could see it, feel it, sense it in an infinite number of ways.

If this is a measure of oil progress, it is also a measure of how the usefulness of oil has expanded through the years. Once upon a time, kerosene and lubricating oil were virtually the only products of the industry. Today, there are 1,200 separate products which stem, at least in part, from petroleum.

34,000 Competing Companies

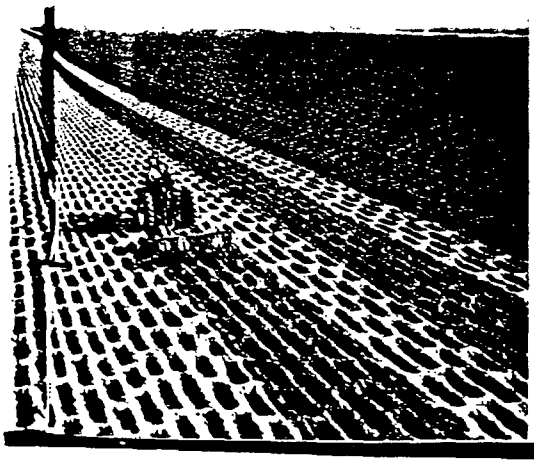
Under the impetus of these widening horizons, the oil industry has grown to the point where today it is composed of 34,000 competitive companies – one-man firms, partnerships, corporations – whose stockholders add up to a total of more than three million.

Each day, that industry produces, refines, distributes, and sells about three times the tonnage of America's great steel industry – three times the weight and volume of oil that it handled only 25 years ago – and the products it makes and delivers have greatly improved qualities and usefulness. In a year, that industry disburses directly some $5.6 billion in wages and salaries, and spends about $2 billion for the goods and services of other industries.

Yet even this is not an entirely accurate picture of the industry. For the oil industry is more than a vast assemblage of wells and refineries, tank farms and trucks; it is people – two million of them. To the motorist, the oil industry is the one or more attendants at his neighborhood service station – and there are some 250,000 stations, or one for every 165 motor vehicles. To the householder, the oil industry is the local fuel oil dealer who keeps his space heater or oil burner supplied. To offices and factories, to railroads and industries, the oil industry is scores of competing suppliers of fuels and lubricants in every locality. And, by the same token, the oil industry adds up to

Air travel today and tomorrow is tied directly to oil progress

To farmers, oil progress has revolutionized farming methods, and fostered soil conservation



Economical mass transportation is related to oil's unending progress

ETC 24172

tens of thousands of different customers for the products of other industries.

Last year, to meet a fast-rising, unprecedented demand for its refined products, the oil industry produced and processed more than 5.5 million barrels of oil a day – or enough to supply some 14 barrels during the year to every man, woman and child in the country. While doing that enormous job – far bigger than even anything it tackled during the war – the industry expanded its refinery capacity, increased its transportation facilities, laid thousands of miles of new pipelines, and drilled some 40,000 wells.

High Level of Operations

Nor has demand materially lessened on balance this year. For while demand in all other categories has receded variously from last year's abnormal peaks, demand for the principal product, gasoline, has continued to increase. Through the first eight months, gasoline demand showed an increase of 5.7% over 1948, with the result that aggregate demand for petroleum products was only 2.8% below that of the same period in 1948. Moreover, a recent government forecast declared that total demand for all of 1949 will be about equal to record-breaking 1948.

But more to the point, while the U. S. economy at large was undergoing a period of "readjustment," "disinflation," or the more widely advertised "recession," the oil industry was taking steps of deep significance for the future.

For one thing, it was spending an average of $2 billion a year – for the third successive year – on new equipment and facilities. As one result, it had a potential refining capacity last month which could handle more than 6 barrels of oil daily for every 5 barrels at the end of 1945 – or an increase of more than a million barrels a day in less than four years. The actual new construction was even larger than these figures would indicate, because a good part of it went to replace older equipment which was subsequently dismantled.

Developments such as these point up an incontrovertible fact: how the oil industry is continually alive to its responsibilities and is constantly planning for the future. It is traditional that the industry is a leader in modernization and in research – for which it spends over $100 million a year seeking new and better products for the public.

In the nine decades of its existence, there has never been a time when the oil industry wasn't working – and hard – to serve the public even better than before. The last decade provides as good an example as any.

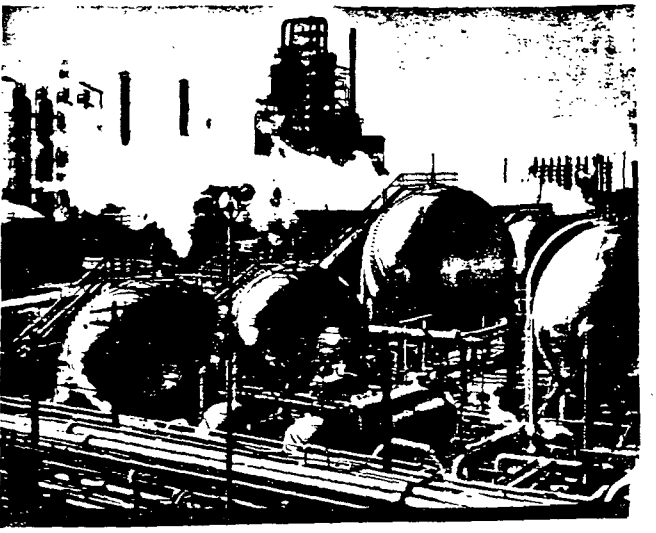
Reserves at All-time Peak

Despite severe shortages of materials during the war and postwar years, and in the face of continually mounting costs, the industry succeeded in increasing proved reserves to the highest level on record: 26.8 billion barrels of liquid hydrocarbons, as of December 31 last. In crude oil, the industry increased its reserves by more than 5.9 billion barrels in the last decade – after supplying the nation and the world with the unbelievable total of 15.9 billion barrels of oil. In that single decade it supplied more oil than in the first 74 years of its existence put together. During that time, too, not only have three new states joined the ranks of oil producers, for a total of 26, but older states have come into their own as modern exploration and drilling techniques have reached down and uncovered their hidden wealth.

This, in sum, is one measure of the industry's worth as it marks the ninetieth year of its life. And men who know this industry best confidently predict that oil will be playing an even greater role in the American drama ninety years from now.

ETC 24173

Extending our known oil resources, and expanding and modernizing facilities and equipment, are all part and parcel of oil's continuing progress



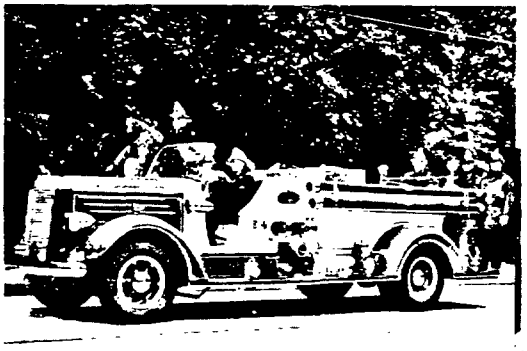
MAKING IT HOT FOR FIRES

Modern engineering and design make our postwar fire trucks the last word in speed and efficiency

WATCHING THE neighborhood piece of fire apparatus come screaming down the street and then hotfooting after it to the scene of the blaze long has been one of the traditional thrills of boyhood.

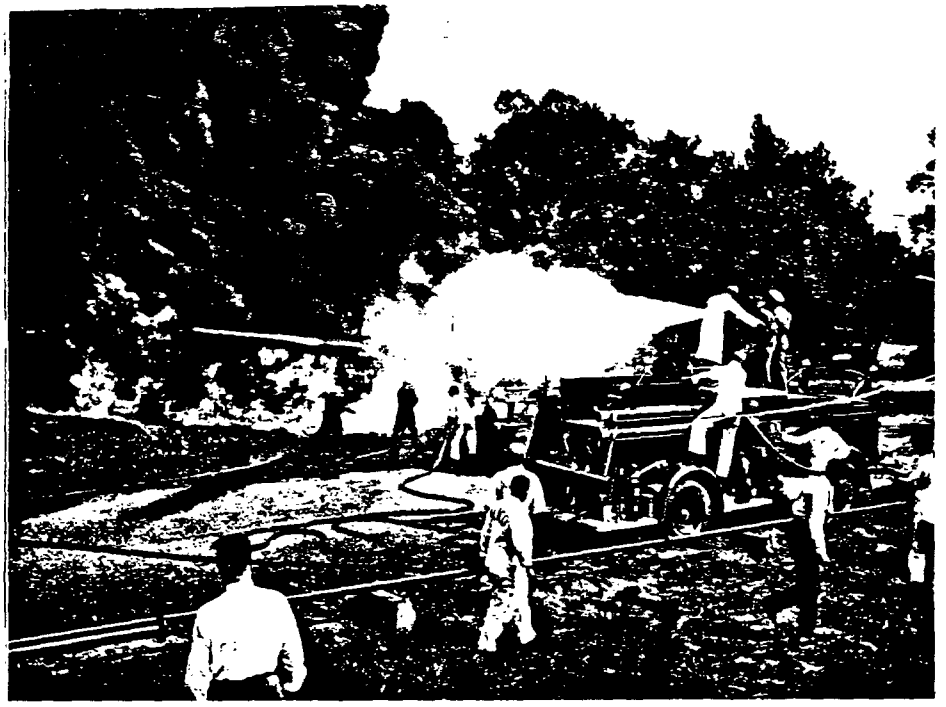
For days after a fire, a boy's every dream is of the time when he can be a "fire enjin" driver. Like most other youthful aspirations, this one moves to the background as we grow older and trade boyhood yearnings for the realities of life. But the aspiration is only put aside, not forgotten. To drive a fire engine, for the thrill involved, still remains the innermost desire of many a kid grown up.

Anyone who was to realize this ambition today would perch himself behind the wheel of the slickest, most compact, and most utilitarian fire fighting equipment the world has ever known. The modern American "fire enjin" is, as one would expect, the last word in engineering and efficiency.



ETC 24174

These photos contrast the old and the new. The last horse-drawn apparatus was made just before World War I, and none is any longer in active use



The versatile airport crash truck is a war development. With hose nozzles poised for immediate action, it is at the scene the moment the disabled plane touches ground

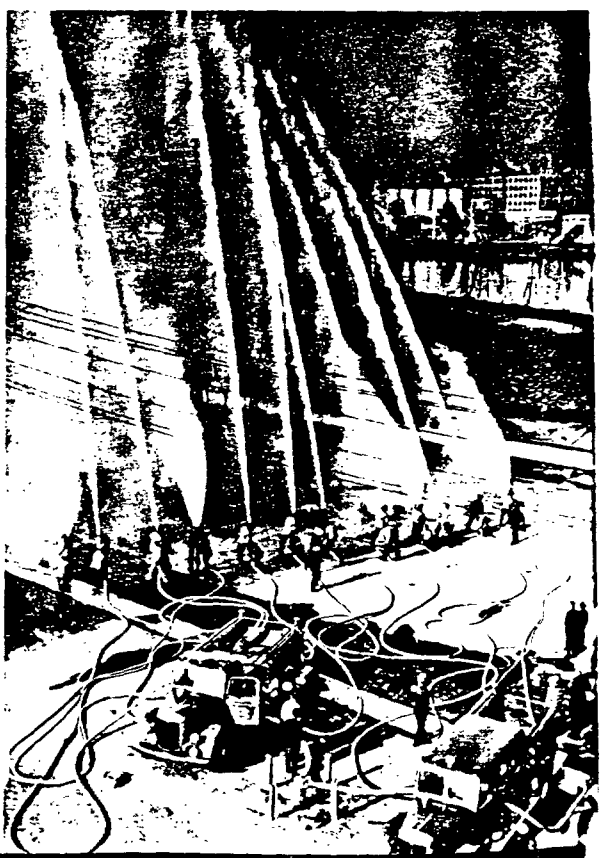
Husky 6- and 12-cylinder engines of as much as 295 horsepower are built for long life and heavy duty service, and pack an ample reserve of power for any emergency. Better weight distribution makes steering almost as effortless as driving a passenger car. Shorter wheelbases have reduced the over-all length of the average "hook and ladder" and have greatly increased maneuverability. Some of the big 1949 jobs can turn around in narrow streets and alleys that the smaller pumpers of prewar vintage could not easily negotiate.

In addition to these major engineering advances, the modern fire engine incorporates several other features. Chief among these are greater driver visibility, more carrying space for hose and other equipment, increased water capacity, improved control systems for operating aerial ladders, and an enclosed cab (ahead of the engine, in one make) which allows several firemen to ride in comfort instead of hanging precariously along the side rails.

Sentimentalists may bemoan the passing of the colorful and romantic fire fighters of earlier days, but the rapid growth of our cities and the heavier concentration of population has demanded extra efficiency, many times at the expense of old-fashioned glamour.

Prior to 1907, no mechanized fire trucks roared out of the station house when the alarm bell in the church steeple sounded. In-the-flesh horsepower, and not mechanical horses, was the motivating force. Spotless white chargers pulled the old-time steamer, its funnel belching smoke, flame and cinders as it worked itself into a sweat to generate power to pump water through the hoses. At the reins was a red-shirted, suspendered man who invariably sported a handlebar mustache. A strong-legged Dalmatian named Spot or Smokey trotted along between the rear wheels, his nose almost riding the axle. Before the era of horse-drawn engines, of course, fire vehicles were towed by the firemen themselves.

As adequate as it was in its day, the non-mechanized fire fighting equipment of yore cannot stand up against our modern apparatus in any respect. The emphasis in fire fighting always has been on speed, but today's arrangement of build-



Apparatus must meet high standards to win Underwriters' approval. These engines are undergoing a test for pumping capacity

ETC 24175

ings puts a higher premium on time than ever before. In our highly built-up areas, the undue loss of even seconds can mean the difference between a small fire and an inferno.

Another factor is that firemen and equipment are now called upon to combat fires of a new type. Airplane fires, for instance. If the crash truck can't be at the scene and have hoses playing on a burning aircraft within 90 seconds, the firemen might just as well not bother. After then, say the experts, there is little hope of rescuing anyone from the plane.

All in 90 Seconds

Consequently, modern ingenuity and engineering have come up with a new airport crash truck that can have its hose lines in full operation before the vehicle even rolls to a stop. The answer is that the truck has two engines – one to drive it and the other to provide water pressure. Also, it carries its own supply of water or fire-fighting chemicals. In the meager 90 seconds available for rescue work, the burning plane can be drenched with hundreds of gallons of water or chemicals. Another big advantage of the two-engine arrangement is that the crash truck can circle around the plane to meet wind shifts without having to shut down hose lines.

Even though they are not equipped with two engines, and must use the same motor for water pressure as powers the vehicle, pumper trucks are almost as speedy as the ultra-fast airport crash trucks in swinging into action. Within two minutes after reaching the fire, the pumpers can have more than a third of a mile of hose in play, shooting 1,500 gallons a minute at 150 pounds pressure.

Aerial ladder trucks—which many still call "hook and ladders"—aren't slowpokes either. The flick of three small levers and 30 seconds is all these elongated vehicles need to have their 100 feet or less of ladders edging toward the top of a flaming structure. On prewar models, two or more men had to crank the ladders into position. Now automatic controls do the job, even to the point of stopping the rise of the ladders once they touch the side of a building. The newer ladders are all-metal with electronically welded rungs. These permit firemen to carry heavier hoses aloft than they can on wooden ladders.

To most people, a fire engine is a fire engine. Few realize that there are five distinct types of general service and specialized vehicles.

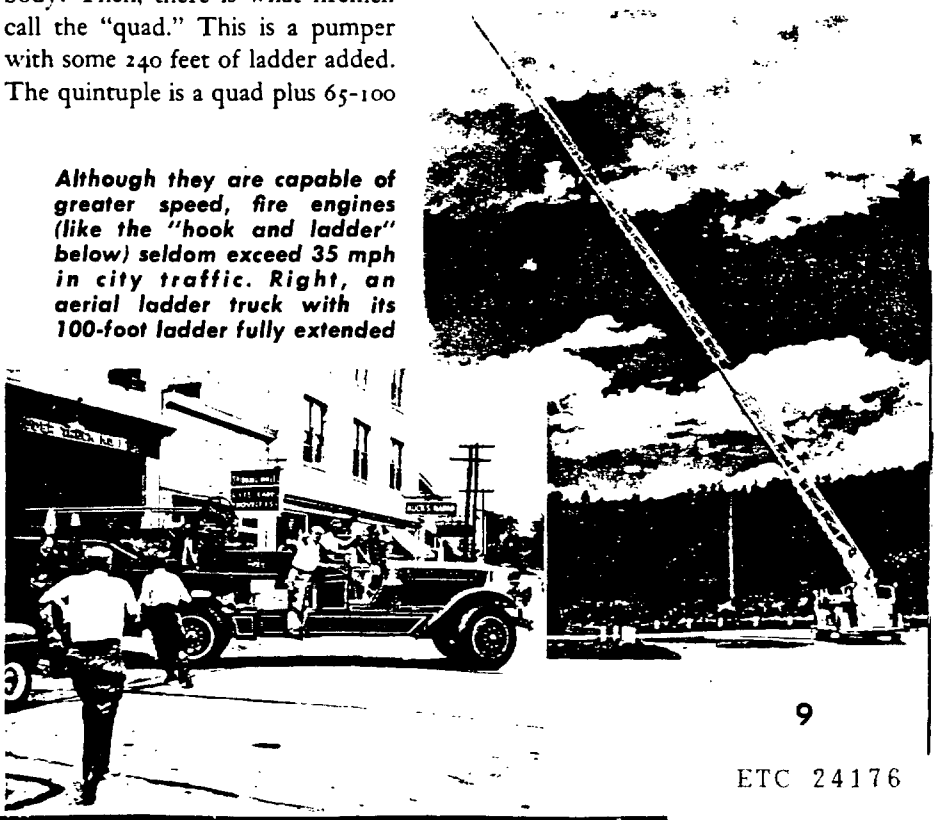
The city service truck carries 200-240 feet of ladder as basic equipment, but also might be stocked with such auxiliary accessories as electric lanterns, crowbars, wall picks, wire cutters, and pitchforks. The triple combination pumper – most common of all fire engines – is made up of a pump of not less than 500 gallons per minute capacity, a small water tank, and a hose body. Then, there is what firemen call the "quad." This is a pumper with some 240 feet of ladder added. The quintuple is a quad plus 65-100 feet of aerial ladders. Finally, there are the aerial ladder vehicles themselves, either the four-wheel truck type or the six-wheel tractor-drawn style.

Presently there are approximately 40,000 pieces of civilian fire apparatus in the United States, spread among 1,200 paid and 13,800 volunteer fire departments. Each community or fire district is free to purchase whatever fire fighting equipment it thinks best, but virtually all follow the recommendations of the National Board of Fire Underwriters.

Gauges Local Needs

The Underwriters, which is a public service organization maintained by the stock fire insurance companies, makes an extensive survey of local fire protection needs.

On the basis of its survey, the Underwriters advises the local government how much of what type equipment the city requires to have a properly balanced fleet. All figures are primarily based on population. A city of 20,000 residents,



Although they are capable of greater speed, fire engines (like the "hook and ladder" below) seldom exceed 35 mph in city traffic. Right, an aerial ladder truck with its 100-foot ladder fully extended

for instance, should own three pumpers. If this same city has five buildings of three or more stories, it should also provide at least one ladder truck. The bigger the city, of course, the more equipment it needs.

Varying Requirements

In buying a new piece of fire equipment, the community may take a standard assembly line vehicle, or it may specify a thousand and one deviations from the standard model. Maybe it needs a narrow body with running boards and no equipment compartments. Or maybe it wants just the opposite — a wide body without running boards but with equipment compartments. Perhaps a body aisle on the side is preferred to one in the middle. One city asks that the ladders be mounted overhead, while another specifies the ladder inside the body.

Often the deviation from standard does not concern construction or body arrangement matters. It has to do with fancy scroll-work and decorations. Although the trend is away from excessive trim of this type, some communities are willing to pay as much as $300 extra to have the city seal, an eagle, or other distinguishing insignia applied to the doors or body of the vehicle they are buying. Such art work is all done by hand and genuine gold leaf is used. Thus the high cost.

Red Not the Only Color

Another way in which fire departments can show individuality is in the color of their fire apparatus. By far, most fire engines are red. But not all of them. Upon request, fire engine manufacturers will paint the apparatus red, orange, canary yellow, white, blue or green. In this respect, the nation's most colorful fire department probably is that of a town in Maryland. It has apparatus of five different colors. Next to red, white is the most popular color. A spic-and-span white engine is a thing of beauty and therefore a big favorite among firemen who like to compete for parade prizes.

In America there are eight or ten established fire apparatus manufacturers. Some make a complete line of the different types of apparatus. Others specialize in a few of them, turning out maybe only pumpers and quads or quads and aerial ladder trucks.

$13 Million Output

Last year, these companies produced something like 1,200 pieces of fire equipment with a retail value of about $13 million. Perhaps another 100 or so trucks were fabricated by non-established assemblers, such as garagemen and truck distributors. By building a fire engine around a commercial truck chassis on their own premises, local garagemen often can underbid the established manufacturers by several hundred dollars. As with everything else, the price of fire engines is up over prewar. A 500-gallon pumper mounted on a light commercial chassis, which cost about $4,500 in 1940, sells for $6,500. Tractor-drawn aerial ladder trucks which sold for $19,000 prewar now carry a $34,000 price tag.

The postwar demand for new fire apparatus once was in the proportion of a deluge, but supply is rapidly catching up with demand. One reason for this is the fact that virtually all engines made in America stay right here. Exports total only about 5%, with Alaska, Hawaii, South America, Central America, and South Africa the chief recipients. American-made fire engines are not practical in Europe. The Continent has little need for aerial ladder trucks or for pumpers of more than 500-gallon capacity. In this country, the 500-gallon pumper is the smallest recognized unit.

Always Ready to Roll

Sturdiness and dependability are the hallmarks of the fire engine. No matter what the weather, climate, or terrain, it must be ready to roll at a moment's notice, get to its destination as quickly as possible, and then do yeoman work at the scene of action. The fire engine can do that only if it has a powerful, ever-ready motor and is well designed and constructed throughout.

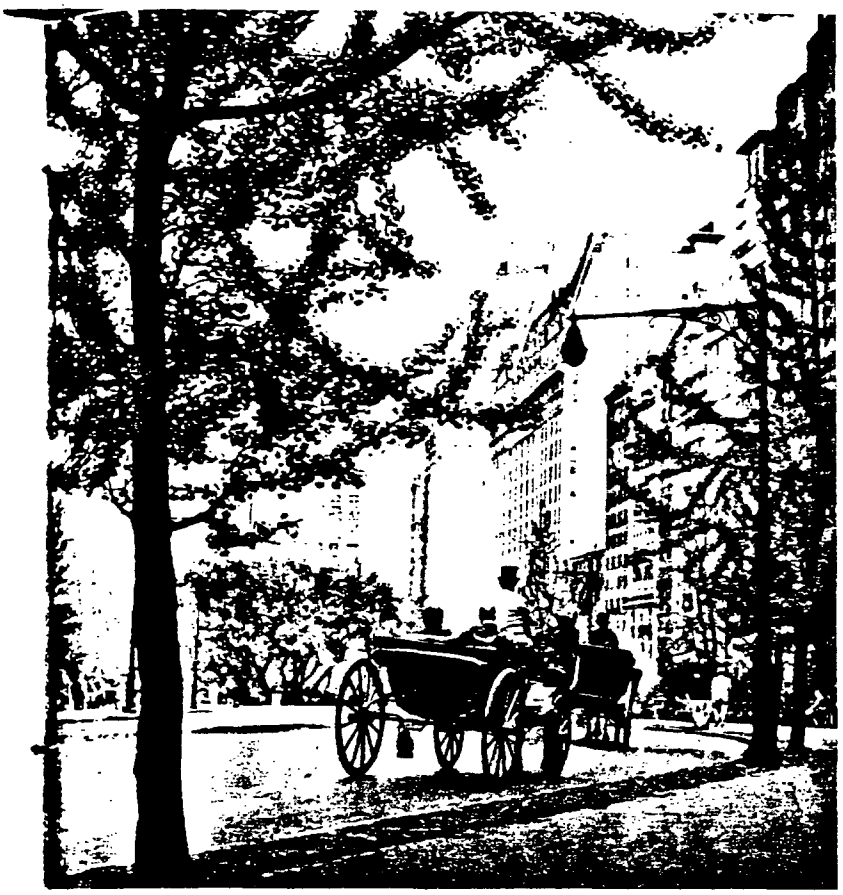
Adequate testimony of the hardiness of fire engines can be found in most any station house. There, chances are, you'll see a late model pumper or aerial ladder truck and next to it an older piece of equipment. The normal life span of a mechanized unit is 25 years, but many yet in service are much older. That engines such as this remain on the job is a tribute to their dependable construction and to the paternal care given them by firemen and fire department mechanics.

Aid in Many Emergencies

Fire departments, operating with well-equipped apparatus, perform far greater public service than many realize. They are always on hand, of course, for anything from a grass fire to a blaze that threatens an entire city block. But beyond that, they are constantly on the alert to assist in other emergencies, such as saving life through inhalator treatment to victims of asphyxiation, heat exhaustion, and water accidents.

In times of distress such as these, it's a comforting thought to know that highly efficient fire engines and the men who man them are at our beck and call any time of day or night.

ETC 24177



THIS IS STILL NEW YORK

By Harry Botsford

New York is not all modern. Many customs and habits generations old still survive amid the hustle and bustle

A couple take a leisurely ride through Central Park in a carriage . . . as people did back in the Mauve Decade

NEW YORK is a city of sharp and amazing contrasts. To the tourist, it is a town of towering skyscrapers and roaring subways, of glittering theatres and gaudy night clubs, and of all the other things that stamp a city as modern. But to those who know it more intimately, New York is in many ways as old-fashioned as peppermint candy.

Despite its modern facade and mannerisms, there still endure, here and there in New York, indelible traces of other years — customs and habits generations old.

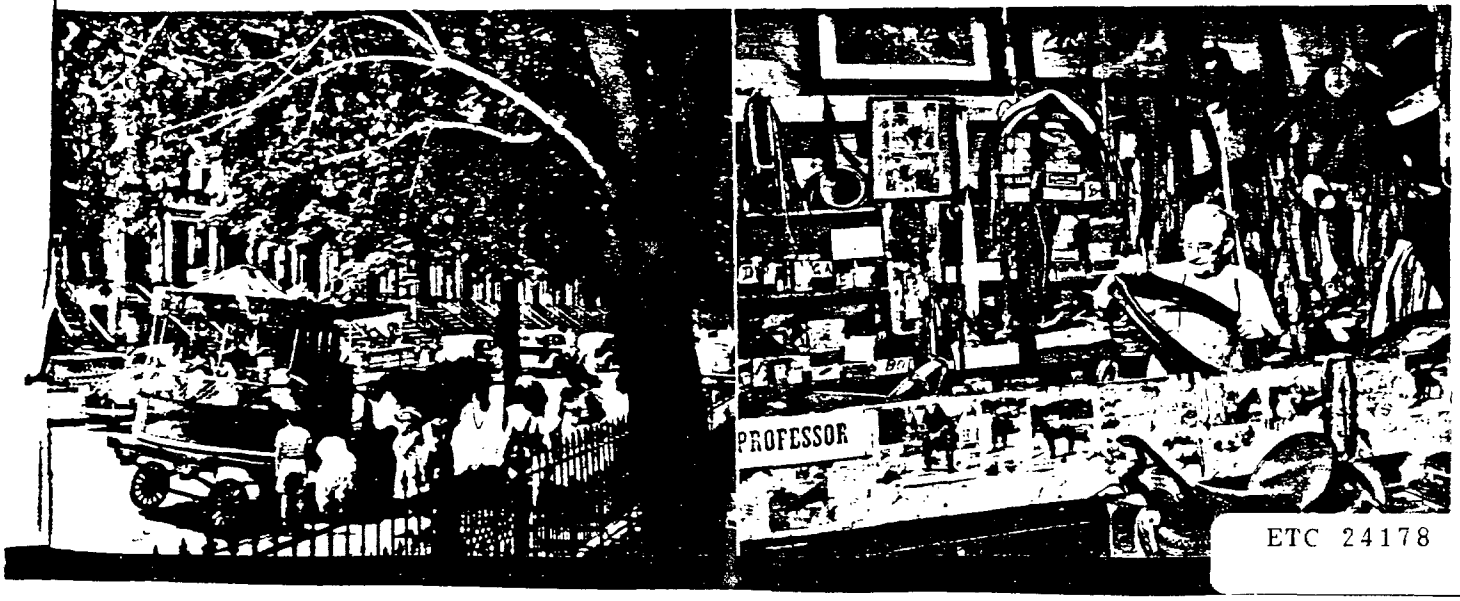
Down in Greenwich Village, in a battle between progress and nostalgia, modernization has won many skirmishes. But in MacDougal Alley, there is still the soft glow of gas street lamps, and they're a nice sight of a misty evening.

Rivaling its modern stores and shops, New York's pushcarts do a business that is simply amazing. In Little Italy, for example, the sidewalk salesmen sell everything from corsets to carrots, and the trades are all punctuated by a shrill babel of voices.

No one-horse town, New York's horse population is large enough to support a dozen and a half harness

The venerable carousel is an eternal summer favorite with the children of New York

New York still has a big enough horse population to support a number of harness shops



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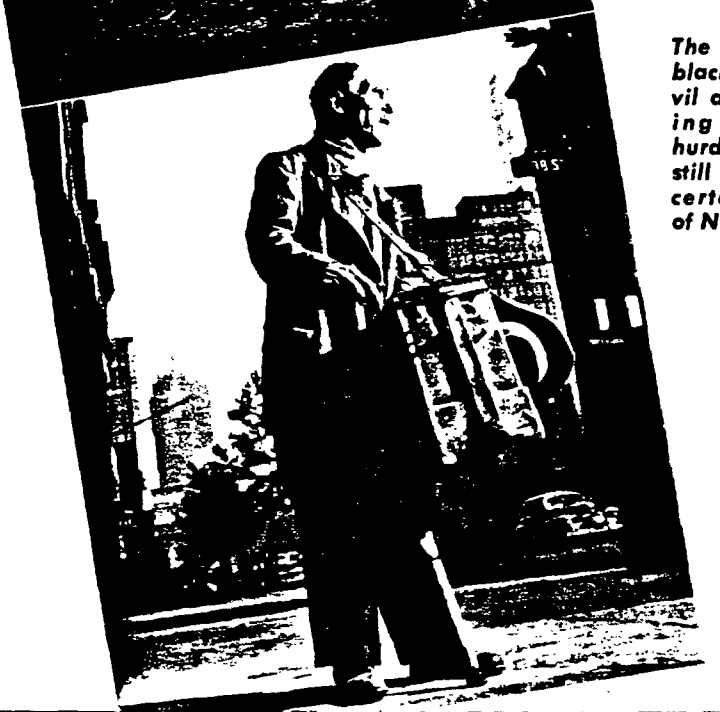
Numerous pushcart markets dot the lower East Side, selling everything from food to clothes



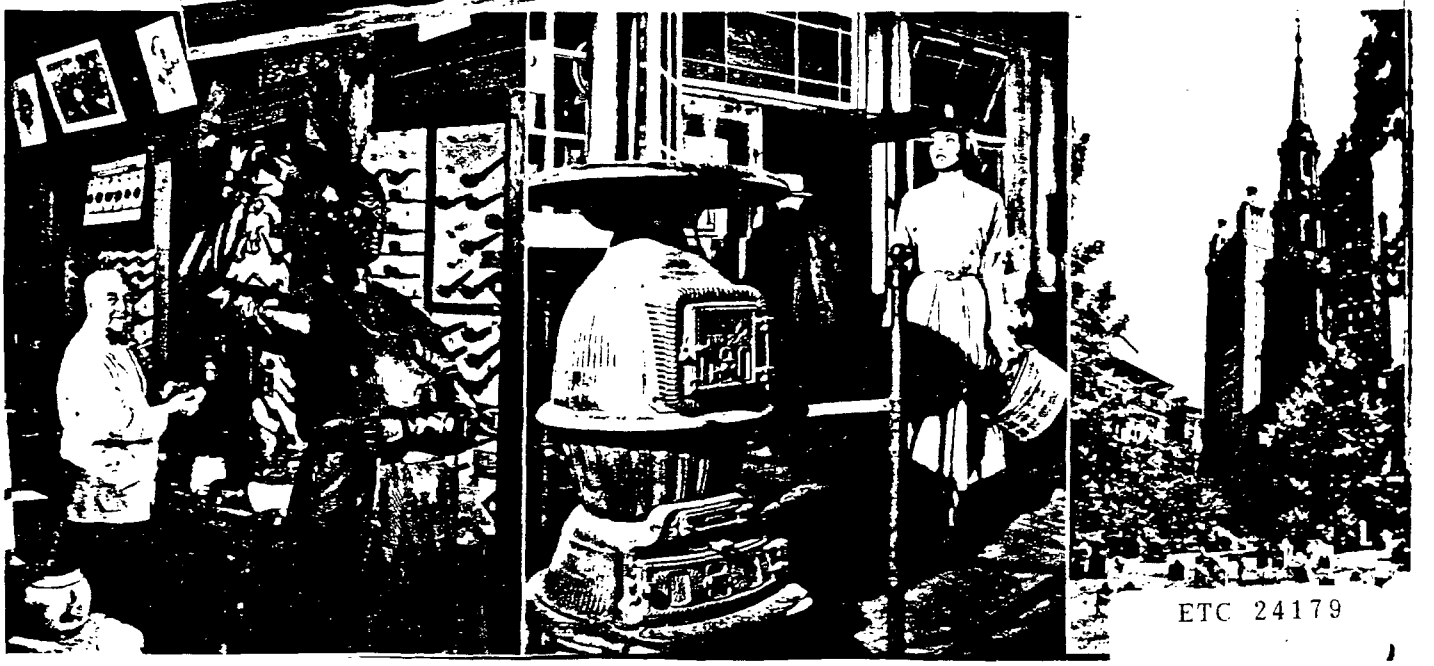
The sound of the blacksmith's anvil and the halting notes of a hurdy-gurdy can still be heard in certain sections of New York City

shops, and on a few West Side streets can be heard the clank of hammer against hot steel, as blacksmiths ply their ancient trade.

For all the swank restaurants and cocktail lounges, there are many old-timers which have passed the half-century mark and more. Keen's Chop House, with its ceiling covered with blackened clay pipes and its walls plastered with nostalgic playbills, is as popular as it was when Diamond Jim Brady ate there. Luchow's robust German fare is as good as it was in the Gay '90s.

At Columbus Circle and Union Square, the evening air is shat-

A wooden Indian in a tobacco shop and a pot-bellied stove in a 3rd Avenue "L" station still observe the passing scene



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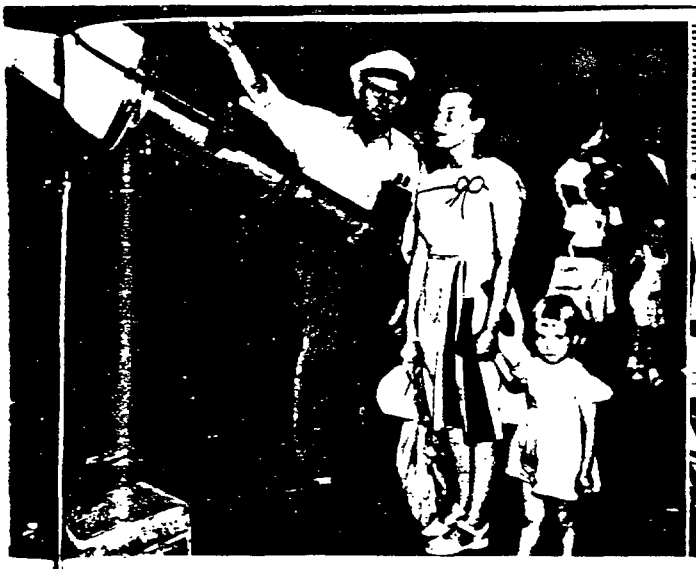


Astronomical views, like trips to the Statue of Liberty, are standby attractions

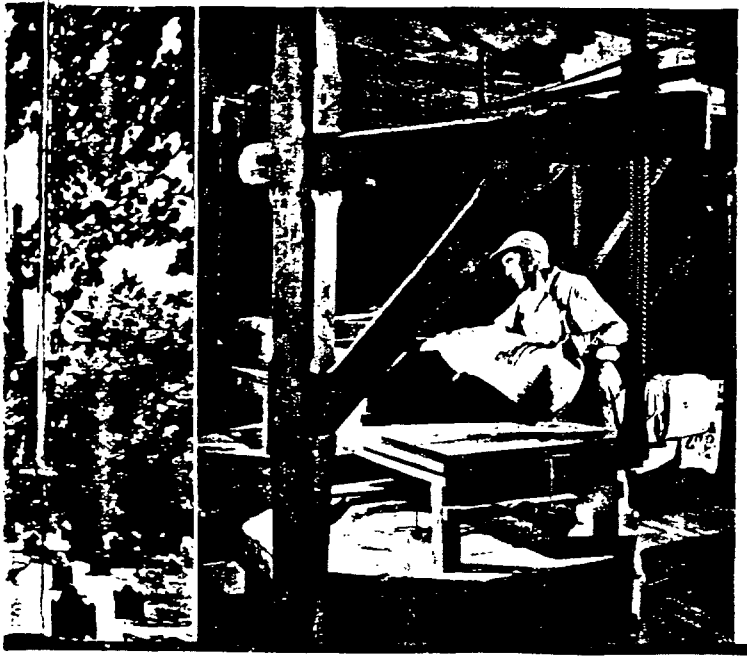
A semi-annual event in New York is the outdoor art show that takes place in Washington Square

tered by men and women on soap boxes, spouting many curious and esoteric doctrines. In 50 years, the themes — religion, politics, economics — haven't changed greatly, and the listeners are just as tolerant, and just as cynical, as ever.

And so it goes. In an age of air-conditioning, television, fluorescent lighting and bebop music, not all of the things, nor all of the customs, that belonged to our yesteryears have vanished. Many of them have survived and, indeed, thrive as vigorously as they did in days gone by. You'll still find them in cities like New York.

For people who eat "al fresco," New York's sidewalk merchants offer a selection of snacks ranging from hot dogs and pretzels to corn on the cob, clams, and pizzas

Not many miles from historic St. Paul's in lower Broadway is this old grist mill. Both landmarks date back to the 1700's



GRADE A SERVICE

The dairy industry depends upon trucks to move almost all of the nation's milk from the farm to your dinner table

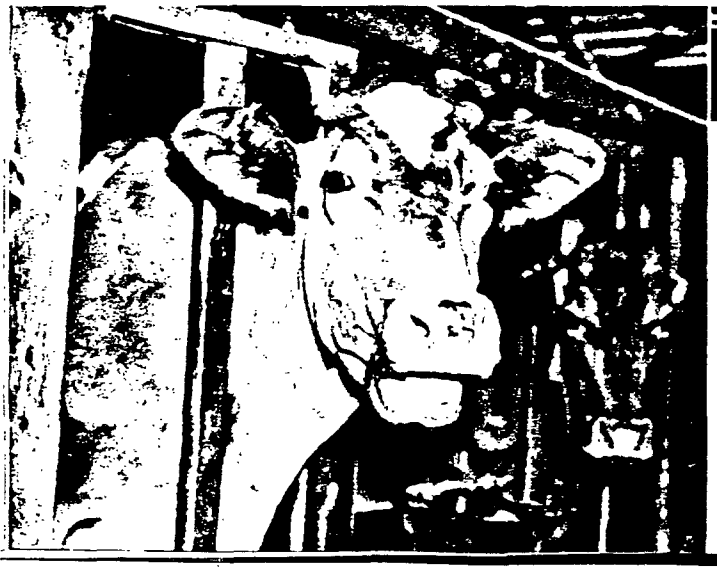
MILTON HENDRICKS shook the sleep out of his eyes as he focused his attention on the milking machine that was efficiently drawing milk from Darla, his cow.

Then, for an instant, he thought about the days when they milked by hand — how on cold days he had to soak his hands in warm water to get them pliable enough for milking. He thought about the poor roads to town and the milk which was spoiled in transit during warm weather. "A lot of things have happened since then," he reflected, "and I'm glad I've been around to see them happen."

What has happened during Milt Hendricks' years as a Wisconsin dairy farmer etches out a fabulous epoch of the American way of doing things. It spotlights an industry which all too often is taken for granted — yet it's a $10 billion industry that in some way concerns one out of every 15 workers in this country. Too, it is an industry that depends heavily upon the automotive and petroleum industries. Milt Hendricks had never been one for statistics, but he knew that almost 90% of the nation's dairy farmers own and operate at least one motor vehicle. In his own part of the country, most dairy farmers owned both a truck and a passenger car.

Hendricks knew that without the motor truck his dairy farm would be far less successful. He thought about this as he watched the hired man pour rich milk from the milking machine into 40-quart cans. In a few minutes the cans were lifted onto a cart and Milt followed the cart into a cooling room. There, he helped pour the contents of the cans into a cooling machine which quickly chilled the milk to 35 degrees. The milk then was poured back into the 40-quart containers, and these were loaded onto a pick-up

Improved breeding has doubled the milk output of cows during the past century



Once his cows have been milked, the farmer speeds the milk on its way to the market

ETC 24181

truck. Milt climbed into the driver's seat, waved good-bye, and guided the truck on its way.

Twenty minutes later he backed his truck up to the receiving station platform and gave the men a hand unloading the milk cans. Less than an hour ago the milk had not yet been taken from the cow. Now here it was at the receiving station, being tested for bacteria and butterfat content. The Chicago Board of Health, which controls milk quality in his area, has rigid bacteria and acidity regulations. But then Milt Hendricks learned long ago that clean cows and spotless equipment help make good milk. Also he was aware that cream and butter made from his milk were being shipped to Philadelphia and New York, and that these products must meet high standards in those cities.

To Market in High Gear

He watched a trucker jockey a stainless steel 2,800-gallon milk tank truck into position near a spout. The big vehicle was filled in a few minutes and immediately was dispatched on its way to Chicago, two hours distant. By tomorrow morning the milk would be on someone's breakfast table.

Milt turned and walked into the receiving station office. A young lady gave him a receipt for his milk and smiled as she said, "Good high butterfat as usual, Mr. Hendricks, you got another bonus."

"Milk's about the only product I know of that gives me more for less – it weighs more when it's watery and I get less for each gallon. It weighs less per gallon when it's rich in butterfat and I get more for it," Milt observed wryly. He put the receipt in his pocket, got back into his truck and headed for a restaurant for a cup of coffee. His part of the job was done – for the moment at least.

Milton Hendricks is typical of the nation's dairy farmers – a group which provides every fourth "bite" of food we eat.

Some 60 million quarts of milk are distributed in the United States every day. On a yearly basis, that averages more than 150 quarts per person and, in all, is enough to circle the earth 140 times when placed in quart bottles side by side.

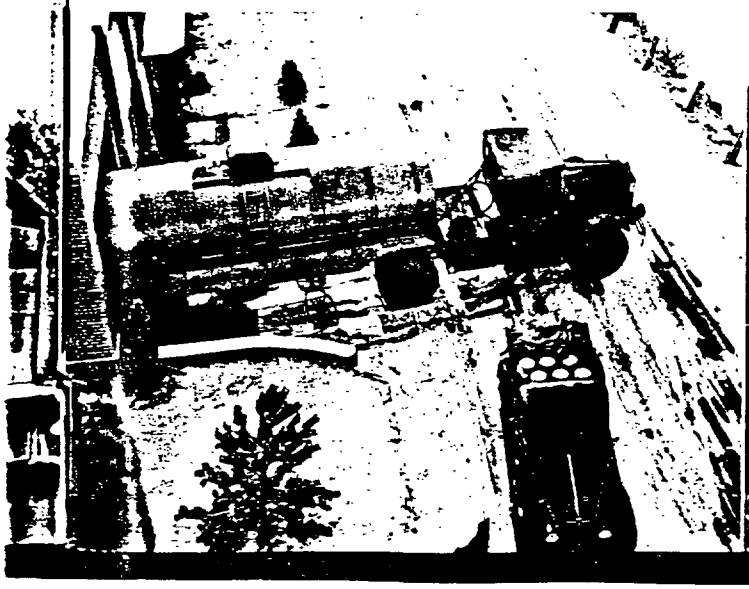
The rapid delivery of this milk depends almost entirely on some 190,000 trucks, which transport milk and dairy products from farms to city plants and from plants to consumers. The dairy industry, as a whole, employs more motor trucks than any other single industry. It uses trucks of every conceivable weight and size, from the light pick-up to massive heavy-weights which tow tank trailers in tandem over the highway. They move millions of gallons of milk every day – in every kind of weather. The average quart of milk travels 200 miles by truck before it reaches the consumer's table.

Industry Workhorse

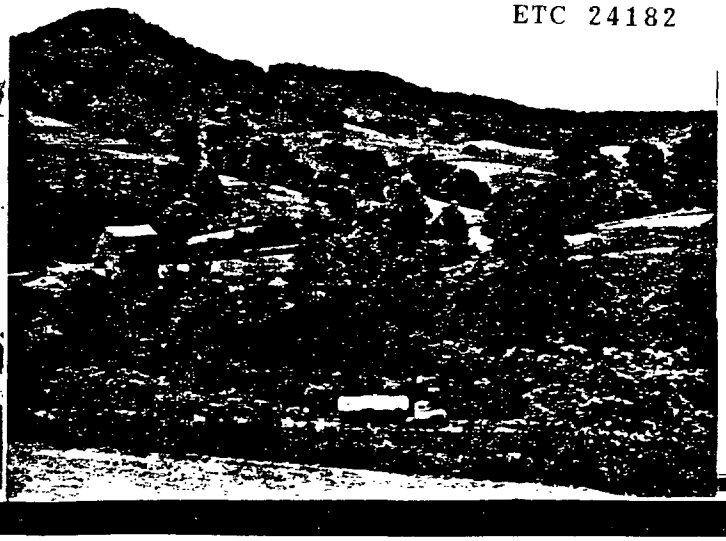
The workhorse of this vast transportation network is the tank truck such as Milt Hendricks saw leaving the receiving station. The high-balling of dairy products over our highways is a dramatic story of achievement in itself. Consider the fact that milk entering New York City comes from as far away as 500 miles and yet is delivered on doorsteps not more than 36 hours later.

The tank truck into which milk is loaded at the receiving station for shipment to a city is a scientifically designed vehicle. It can carry its health-giving cargo for 72 hours through all kinds of weather without any noticeable increase in the 35-degree temperature to which the milk was originally chilled. Strange as it may seem, this is done without the aid of refrigeration. The tank is

At the receiving station, milk is tested before being piped into waiting tank trucks



Tank trucks transport milk to dealer plants, some of which are hundreds of miles distant



ETC 24182

of welded stainless steel or aluminum and is insulated. A powered agitator stirs the milk to keep it from settling out.

Weather Sets the Course

Regularly scheduled runs for these milk tank trucks may extend to a town only 25 miles away. Or it may mean an 850-mile trip from Indianapolis to Jacksonville, Florida. In either instance, short trip or long haul, weather is an all-important matter to the driver as he pilots his mammoth vehicle over the highway. A sudden rise in atmospheric temperature may mean that he will be re-routed to meet a given area's expected increased demand for milk occasioned by warmer weather.

The New York Dairymen's League Cooperative Association, for one, keeps constant tab on the exact whereabouts of its trucks. The League knows from experience that a change in temperature means a change in demand. If the temperature goes up, New Yorkers will consume more dairy products. So, out go messages to terminals and diners where tank truck drivers are known to stop. In a matter of minutes, more milk will be on its way to the city.

Once milk reaches the city plant a series of rapid-fire operations takes place. Here it is filtered, homogenized, treated with vitamins, pasteurized, cooled, and bottled. It is then ready for delivery. At this point, again, men and machines team up to form a remarkable distribution system.

Take, for instance, Abbott Dairies, Inc., a leading Philadelphia milk distribution firm. In serving a 123-mile radius of that city, Abbott requires a fleet of 632 motor vehicles. This fleet alone covers 4,700,000 miles a year, consuming 825,048 gallons of gasoline and 52,000 quarts of motor oil.

Constant Stops and Starts

The stress and strain on a retail milk delivery truck are great. In Philadelphia, a city of many homes, it is not unusual to find 70 houses in one city block. These residences may be served by as many as eight different dairies, for the milk business is highly competitive. Abbott's share of the business in this instance calls for the milkman to make 24 vehicle starts and stops in that single block. On his complete route, the average Abbott milkman makes 384 such starts and stops. The longest Abbott route is 60 miles; the shortest, 16 miles.

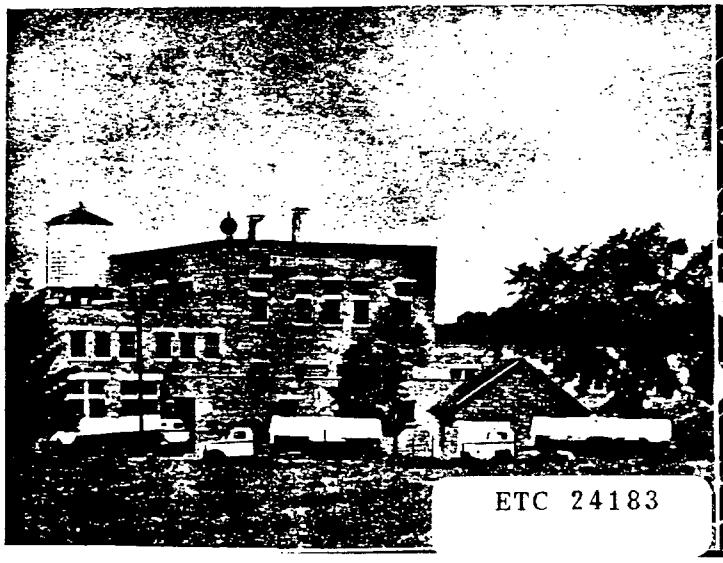
A milkman's working day, incidentally, is made up of far more than leaving dairy products and collecting empty bottles from a doorstep. Traveling about as he does in the early morning hours, he often is the only person around to give aid to injured people, to sound alarms for fires that otherwise would go undetected immediately, and even to thwart hold-up attempts.

All in the Day's Work

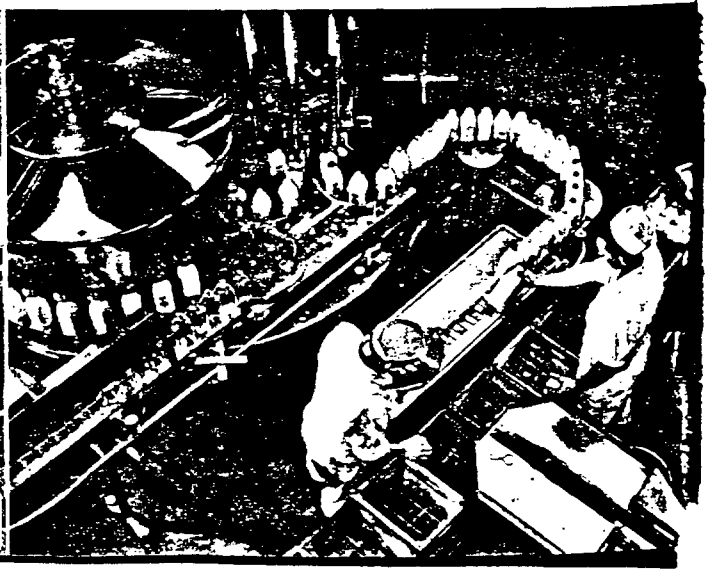
Few workers enjoy the writings of their customers as much as the milkman does. Typical samples of his "bottled" messages go like this: "Dear Milkman — Please lay a dozen eggs on my front porch"; "we don't want milk every day we want milk today tomorrow we don't and next day will just like the day before." And "when you come will you please give cat his milk. His bowl is on the refrigerator. Put some coal on fire. Take in clothes on line. Oh, yes, and no milk today, thank you." Also, "we've gone to the city overnight. Will you look at the children and make sure they're all right?"

Just as the man who brings milk to your house has the added speed and efficiency of a motor truck, so has mechanization played a major role in getting milk from the farmer

This is a typical dealer plant. Here, milk is processed and treated prior to bottling



Bottles are filled and capped by this sparkling machine, after which they are crated



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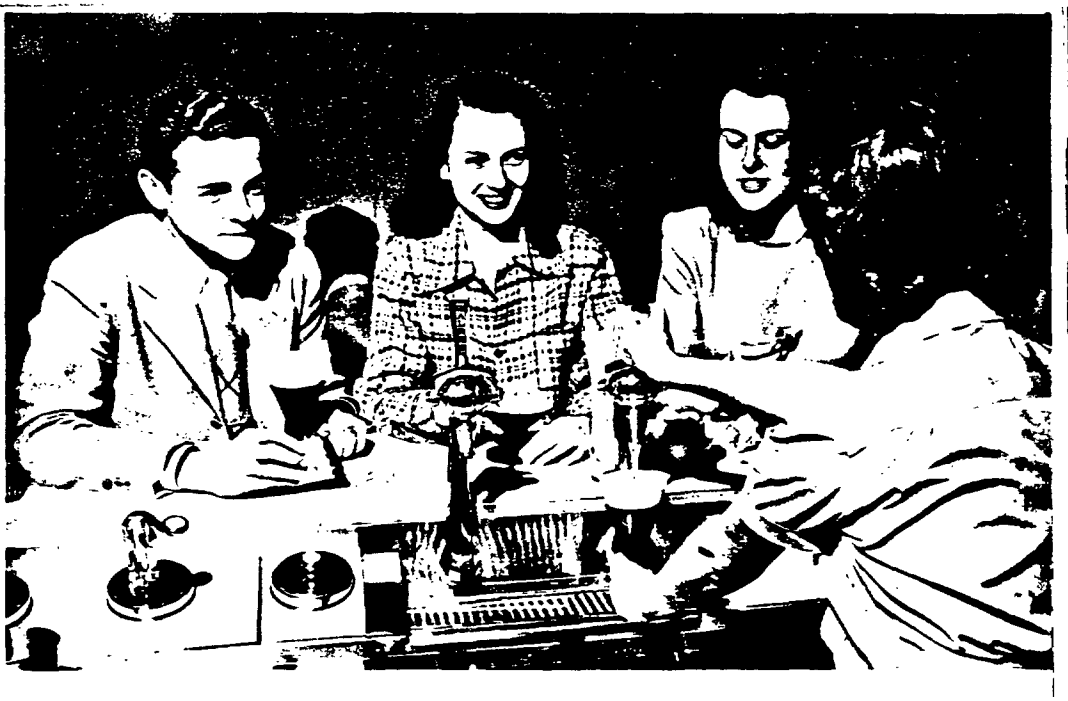


Delicious sodas and sundaes have made the "milk bar" an American institution. It is always well-stocked with ice cream delivered regularly by truck

to the dealer without delay.

The forerunner of the modern milk tank truck was devised in 1911, when someone thought to mount a 1,000-gallon tank of two-inch cypress, lined with tinned copper, on a wagon. The list of troubles that beset these first tank trucks was long and varied. The roads were bad, and tanks only partly filled with milk were not too secure on their mountings. Following a nine-mile run into Ashtabula, Ohio, an early dairy operator reported nine pounds of butter on the side of the tank, one pound for each mile. Someone jokingly suggested this might be a roundabout way of manufacturing butter. However, further experiment proved that the milk rode safely when the tank was full. Also it was agreed that insulation was a necessity.

Detroit Is Example

The trend toward the tank truck was well established during the years that followed.

In Detroit in 1915, for instance, less than 16% of the city's milk arrived by motor truck. By 1924, trucks, many of them tankers, were handling almost 90% of Detroit's milk needs, which, incidentally, had tripled in those nine years. Today, Detroit relies totally on motor vehicles to bring in its milk supply.

Although the tank truck symbolizes the ever-growing dairy industry, the cow has not escaped modifications imposed by the scientific age. In 1850 the average annual production per cow was 2,360 pounds of milk. Now, it's 5,000 pounds. Improved breeds average over 8,800 pounds annually.

To move the tremendous volume of milk resulting from this increased production, the nation depends almost entirely upon the motor truck. Without the truck, our modern system of milk distribution could not have achieved its present speed and efficiency.

Bottled milk usually reaches the home within 36 hours after it has been taken from the cow

Our modern distribution system keeps the American table well supplied with dairy products

Jet Eductors for Handling Gasoline

THE CEASELESS EFFORTS to improve refinery operations take in little things as well as big. Not only do refiners continually seek improvements in their basic refinery processes; they are also always looking for greater efficiency in blending various fuel components, in mixing antiknock compounds and dyes, and in the general handling and storage of finished products.

As part of this, one subject to which a number of refiners have been giving some thought and study is the handling of gasoline dyes.

These dyes – soluble, penetrating and stable – perform a highly useful function in the oil industry, serving as a convenient means of identifying different products. Added to gasoline at a refinery, the red, yellow, orange, blue and other colors act as a permanent calling card for a fuel – whether it be regular or premium motor fuel or the various grades of aviation gasoline.

But the same qualities which make these dyes so useful for their purpose also present a housekeeping problem. Because they are light, easily scattered, and extremely penetrating, these dyes will deeply stain everything they touch. Under conventional methods of handling them, the dyes are transferred from opened shipping containers to a dye pot. It is the use of open containers which creates something of a nuisance.

To overcome this problem, a number of refiners have developed enclosed systems for handling the dyes. One system which has attracted interest is that installed by the Standard Oil Co. of California at its El Segundo refinery.

Standard Oil of California's system makes use of a jet eductor to transfer the dye, with the gasoline blend serving as the driving fluid. Containers of differently colored dyes are mounted on a battery of scales, and their dyes are removed, in each case, by a separate eductor. A stream of gasoline, piped over from its storage tank, picks up the dye in the eductor and carries it back to the storage tank, where it mixes with the rest of the gasoline.

In more detail, the finished motor and aviation gasolines are manifolded to separate six-inch circulating loops. A portion of the gasoline flowing in these lines is diverted to a two-inch line, in each case, where a booster pump provides the necessary pressure differential to operate the eductors in the dye house. The discharge from each eductor is returned to the six-inch line running back to the storage tank.

How the System Works

In actual operation, a container of dye is placed on a scale and weighed at the start of the process. If 300,000 gallons of motor fuel are to be dyed – and the dye requirements are 1.5 grams per 100 gallons — then 4,500 grams, or about 10 pounds, of dye are necessary. With the proper color dye on the scale, the operator notes its weight and the reading at which he should stop the addition of dye. He inserts a flexible hose into the dye container, opens the eductor valve, and draws the proper amount of dye from the container.

Only a small fraction of those 300,000 gallons of motor fuel, of course, goes through the eductor. After the required amount of dye has passed through the eductor, "wash" gasoline is flushed through the eductor and its connecting lines, to clean them out. From then on, the balance of the mixing operation is completed in the storage tank.

The jet eductor is, of course, the principal part of the dye handling system. A Schutte-Koerting Figure 222 jet eductor, of 1½-inch pipe size, is used. While this is the primary element of the system, the other parts were chosen with care in order to handle the very finely powdered dyes without clogging. Both the pressure and the return lines form risers at each eductor location. Each riser is fitted with a valve, and above these the jet is mounted. On the suction side of the jet there is fitted a short nipple containing a bleeder and vacuum gauge connection. Above these, the suction line is equipped with a blinding device, a quick-closing valve, a counterbalance swivel joint and, finally, a flexible hose of synthetic rubber to actually pick up the dyes.

Separate eductors are employed for each color of dye used for both motor and aviation gasolines, in order to avoid improper mixing of dyes. Another feature of the system is the use of individual scales for each color of dye. This not only avoids multiple handling of dye barrels but also permits more sensitive scales to be used on colors required only in small quantities.

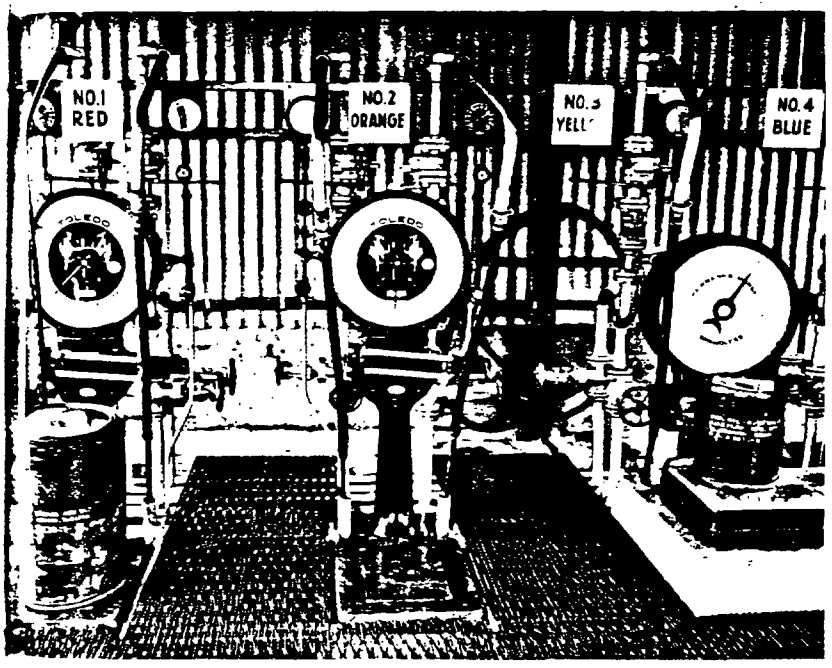
The entire dye plant, complete with storage space for dye inven-

ETC 24185

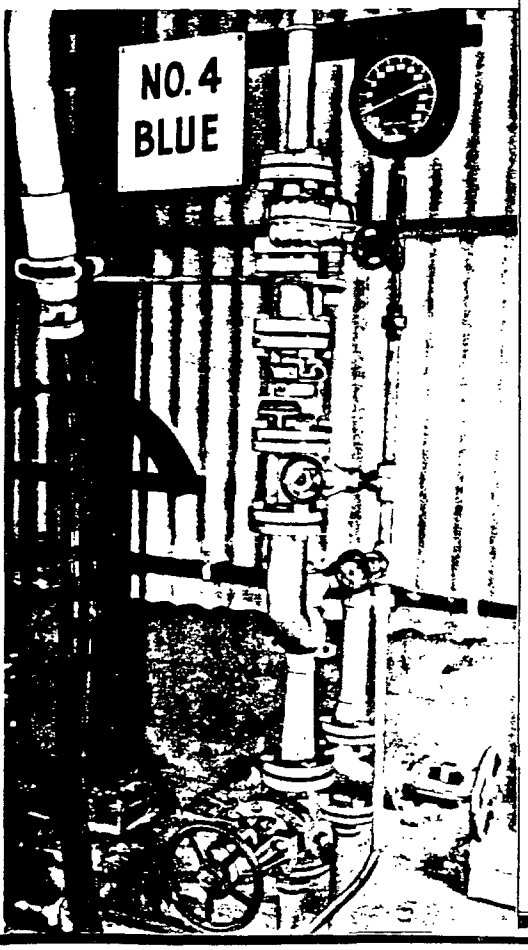
refinery housekeeping problem is being
with an enclosed dye handling system

g
e Dyes

tories, is housed in a corrugated asbestos and steel building especially designed for the purpose. The floor of the building is at truck-bed height, to facilitate the handling of



This building, above, at Standard Oil of California's El Segundo refinery, was especially designed for handling and storing dyes efficiently. . . . At the left are three of the dye eductor manifolds, with their adjoining scales. . . . Below, a closeup of one of the jet eductors



dye containers. The larger scales are set in pits to make their platforms flush with the surrounding floor, thereby permitting the handling of barrels with a warehouse truck. The windows in the building are permanently sealed, to avoid drafts. And the concrete floor is sloped to a drain, in order to facilitate washing down.

Standard of California has found a number of advantages in its dye eductor system. Dyes can be weighed accurately and added to the gasoline without spilling. Much time is saved by avoiding the intermediate step of making dye solutions, prior to their being added to the gasoline; turbulence in the eductor and the loop lines, the company declares, provides sufficient mixing to put the dyes into solution. And, finally, it provides ease of operating and cleaning, adequate facilities for storing and handling bulk dyes, and economical operation.

ETC 24186

You Can't Stay

By Robert H. Joseph

Many respectable people simply drop out of sight — and need to be located for business reasons. Finding them is a fine art that even uses their personality habits as clues

IF YOU THINK you can get lost — and stay lost — try it some time. It isn't easy, not if anybody wants to find you badly enough. Even if you do not leave a fairly obvious trail, there are inevitably those unsuspected and unusual traces which tie you to your past. These clues are your personality makeup and your patterns of habit — and they seldom fail.

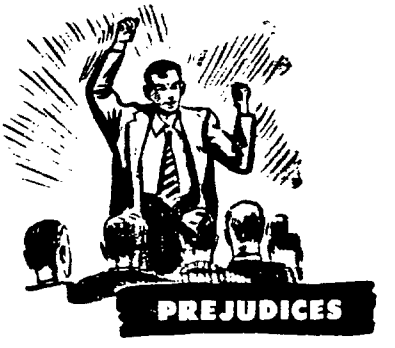
Everyone knows about the type of scoundrel who skips town after making off with the widow's mite. But for every criminal fleeing the police, there are plenty of perfectly respectable and honest citizens who simply up and disappear. Finding these non-criminal missing persons has become a business in itself.

Many such people need to be located for business purposes. They include missing inventors, witnesses to wills, copyright holders, heirs,

and stockholders. In many cases these people, although not intentionally missing, have dropped out of sight years before. But experts claim that anyone can be found.

Take the case, for instance, of a young Eastern woman who witnessed the will of a friend and then left for the West Coast. As time went on, she dropped her Eastern contacts. Twenty years later it became necessary for the lawyer handling the estate to find this woman for the purpose of verifying her signature. A long search proved in vain. Finally, a smart investigator, poring over the records of the case, noted that one of her friends recalled the woman's idolization of the late movie star Rudolph Valentino. Figuring that she might not have lost her infatuation for the great screen lover, he waited in front of a theatre playing a revival of "The Son of the Sheik." She was spotted emerging from the show, a dreamy look in her eyes. The missing witness was identified by her crippled left hand, but it was her nostalgic infatuation that made the search successful.

Hundreds of other instances are to be found in the confidential files of detective agencies where a personal idiosyncrasy has indicated the final step in locating a missing person. Like the adolescent girl who dreamed of being a movie star — she started out ostensibly to visit a relative in Chicago. When she did not show up there, police were waiting as she stepped off the bus in Los Angeles. The fellow who thought himself another Hitler and was found on a soap-box in New York City's Columbus Circle. The man who hated all animals except squirrels, and who invariably visited parks to feed them. The ex-sailor who was never without his free-hand sketching pad. And the romantic who had been a truck driver for years but vowed he would go back to running a steam shovel at the first opportunity. These varied idiosyncrasies were typical habit-clues that enabled pursuing sleuths to make the catch.



The problem of finding a missing inventor is sometimes a headache for manufacturing concerns. An interesting example of this occurred just a few years ago.

Two companies, competitors in their field, came up almost simultaneously with similar ideas for a new device. A patent was already enacted on the idea, it soon became evident, and the two concerns then engaged in separate manhunts to find its holder. They learned that the inventor, an elderly man, had decamped for parts unknown after becoming thoroughly dejected over his lack of success in selling his creation.

One of the firms gave the case to a private-eye organization named Tracers Company of America. Their agent was not able to learn too much about the inventor, except

ETC 24187

y Lost

that he was of foreign, probably Polish, origin and that he hated his name, which, strangely enough, was Anglo-Saxon. The detective reasoned that the man might have returned to his native land, but a check with the State Department revealed no passport application under his known name.

Completely stymied, the private detective sat down and reviewed the slim evidence. If the inventor had such an abiding dislike for his name, he analyzed, perhaps he changed it back to the original in his exit papers. But what could the old name have been?

The name finally turned up during an exhaustive search of old courthouse records. A second check with the Passport Division showed that the man had indeed returned to the country of his birth under his Polish name. He was eventually found, a tired old man of 75, sitting in the square of his native village, declaiming to cronies the glories of his invention and how no one in America appreciated it. The old fellow, it was reported, never quite recovered from the shock — not the shock of selling his gadget at last, but of realizing he would not have anybody to leave all that money to.

Estimates of the yearly number of the non-criminal missing in this country run as high as a million, although no government agency has complete figures on the subject. Of this million, perhaps 700,000 or 800,000 come home quickly when "all is forgiven."

There are definite patterns that are familiar to experts in the field of the missing. Police officers say that when a tired desk sergeant informs a frantic wife, "Lady, your husband will be back within three days," he is not being a prophet. He is merely using his experience in thousands of similar cases of disgruntled husbands. Similarly, private detectives usually advise a prospective client to wait 30 days before authorizing a search. They know that, in many cases, by the time they had collected all the information needed for the hunt, they would receive a pleading call:

"Please return my money. Willie has come home!"

Another pattern is the apparent reluctance of husbands to report their missing spouses. One agency head reports that in his 25 years' experience he has hunted 65,000 missing husbands. Over the same period he has been asked to locate only 15 wives. It's not that so many more men run away, he hastens to point out. It's just that wives apparently are more eager to find their spouses than men are.

When detectives are convinced that a person has played the disappearing act in earnest, they swing

AMBITIONS

into action with a routine that is patiently exhaustive and arduous, with a top layer of quick and imaginative thinking.

Step number one is to gather from all possible sources a total description of the missing one – his physical appearance, habits, hobbies, prejudices, business background, friends, faults and petty vanities, special interests, and his tastes in such things as food and movies. A recent photograph is an important part of this

SPECIAL INTERESTS

data. Only too often a family seeking a middle-aged person will come forward with a childhood picture. It may be a "cute" picture, but it's not of much help to investigators.

The perspiring detective's next step, if there are no immediate leads, is to interview everyone connected with the missing person, even chance acquaintances. A man who is planning to disappear will sometimes tell more to someone he barely knows than to his best friend. Was there trouble in the family or in business? Did Mr. Doe ever say anything about starting afresh in another part of the country? What are the addresses of out-of-town relatives and friends?

Detectives lend an especially attentive ear to any suggestion that the fugitive was interested in Florida or California. It seems that a great number of runaways respond to the lure of a warm climate.

As the mass of information is gathered and evaluated, clues are always turning up. Meanwhile, as in the case of the New York City Missing Persons Bureau, the data is sent out on teletype to neighboring states. Communities more distant also are contacted when advisable.

If all this fails, there are the numberless public records. A good detective is judged partly by his ability to check them accurately. They include more than telephone books from years back and hospital, morgue and police records. Is the missing person a food handler, a barber, real estate dealer, doctor or lawyer? To do business he must have a license. Trace him to a general locality and then check all records exhaustively. Contact the motor vehicle bureaus of all states. Detectives point out that the noncriminal missing, since they are not hiding from the law, rarely change their names. Everyone is listed somewhere in a public record; even a dog owner must have a license.

Since financial difficulties are the cause of most disappearances, the quarry will usually be found in another community making strenuous efforts to recoup his fortune in a line similar to the one in which he lost it. Other reasons for disappearing are friction at home, romantic

EATING HABITS

imagination (this hits teen-agers hard) and boredom, combined with an extramarital love interest. Most of the gallant lovers return home when both excitement and money wear thin.

Of all the problems facing a business organization, the missing stockholder is probably the most incomprehensible. This is the fellow who does not know his stocks have value, or who neglects to leave a forwarding address for his dividend checks. Daniel M. Eisenberg, president of Tracers Company of America, which has developed the finding of this type of missing person into a big business, believes there are a million such stockholders in the United States. He has been busy locating them for a growing number of corporations, and thinks the surface has hardly been scratched.

"Companies didn't agree with me," he says, "when I first suggested finding people who didn't even know they had money in the business. A lot of them agree now. Getting dividend checks back because they were sent to incorrect addresses is a waste of time and money. Conversely, it creates much good will when a corporation seeks out a missing stockholder and says, 'Your company is interested in you; it wants you to have this money which is rightfully yours.'"

Eisenberg's sleuthing organization has located stockholders as unrelated as an Indian on a Western reservation and a missionary in darkest Africa. Which proves you just can't stay lost.

OUR COVER: Moat Mountain, Passaconaway, N. H., by Leo Litwin, Arlington, Mass. **OUR PICTURES**: Bottom pages 4 and 5, Philip Gendreau. Pages 4 (top and top left) and 6, courtesy Standard Oil Co. (N. J.); Page 4 (left center), courtesy General Motors Corp., (bottom left), courtesy World Petroleum. Page 5 (right center) courtesy Shell Oil Co.; Page 7 (top) courtesy Peter Pirsch & Sons, (center), courtesy of Fire Engineering, (bottom), Culver Service; Page 8 (top) and Page 9 (right), courtesy American-LaFrance-Foamite Corp.; Page 8 (bottom) courtesy Mack Manufacturing Corp.; Page 9 (left) courtesy Dorn's Photo Shop; Pages 11 (bottom), 12, and 13 (bottom and lower right), O. Winston Link; Pages 11 (top) and 13 (top and center right), Press Association; Pages 14-16, 17 (bottom right), courtesy Milk Industry Foundation; Page 17 (top) courtesy Fountain Service; Pages 18, 19, courtesy Standard Oil Co. of California; Pages 20-22, art work by Harold Newman.

ETC 24189

A Novel Button Is Helping Oil Companies Dramatize

OIL PROGRESS WEEK

To Their Customers

DURING THE WEEK of October 16th to 22nd, service station men will be wearing big yellow buttons lettered with the cryptic phrase "90 YOOP." If human nature is as curious as ever, car owners all over the country will be asking, "What in tarnation does '90 YOOP' mean?" The answer, of course, is "90 Years of Oil Progress"— which is the slogan adopted by the American Petroleum Industry for this year's Oil Progress Week.

The "90 YOOP" button was developed by Ethyl as a novel means — a "conversation starter"— of telling the public the story of oil progress. As a contribution toward the success of Oil Progress Week, Ethyl has undertaken the distribution of these buttons, and for the past month Ethyl representatives have been working with oil company people in order that as many service station men as possible may have this special Oil Progress Week insignia.

Many companies have indicated their interest in the plan to distribute "90 YOOP" buttons to their stations and dealers. The cost of these buttons is being shared by Ethyl and the companies using them. In addition, a special advertisement was published by Ethyl in the *National Petroleum News*, *Gasoline Retailer*, and *Super Service Station* last month, which offered a button free to any service station man who sent in the coupon.

Service station men are receiving a free "90 YOOP" button for themselves under the terms of the offer contained in this recent advertisement

"So Stupid - those Americans"

"A WONDERFUL COUNTRY, Comrade, yes. I was glad to have seen it. But such crazy ideas have the people."

"So? They are not so far advanced?"

"Such nonsense in their heads! Business competition they call it — freedom — individual enterprise! Bah! Foolishness — waste. So many different people — all in the same business. I tell you, Comrade, in the petroleum business alone are 34,000 separate, independent firms, more than a million workers."

"And so many people are needed? What is this business competition they work at?"

"Some strange idea they have that it is good when each one tries to make things more better and get more customers than each one else because in that way he and his firm will prosper."

"And so they try?"

"Always they try. Research in petroleum they are doing always. Money they spend like water. For what? To find more uses . . . to make products for less cost . . . to make advancements in engineering, chemistry, medicine. All that, when any sensible man knows such things should be the business of the State — that private competition is wasteful and expensive."

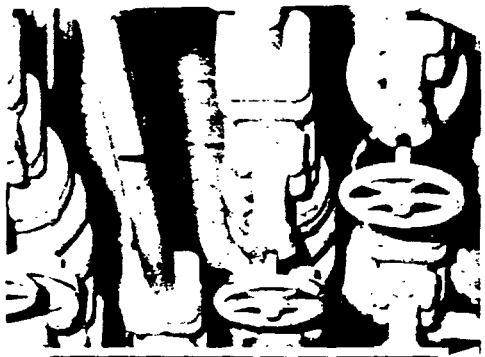
"Of course. Of course. Poor people — their misfortune is very great indeed. And yet automobiles everybody there drives. Sometimes I wonder. . . ."

"Careful, Comrade! Don't talk like that. Somebody might be listening."

OIL BUILDS FOR AMERICA'S FUTURE

ETC 24191

ETC 24192



First

OF MANY FIRSTS

A new nitrogen unit, which went on stream last year, was the first milestone in the $40 million expansion at Ethyl's manufacturing plant. Today, with the entire program completed, this issue of Ethyl News portrays some of its meaning.

IN THE

ETHYL NEWS

NOVEMBER 1

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Published by ETHYL CORPORATION, 405 Lexington Avenue, New York 17, N.

Manufacturer of "Ethyl" antiknock compounds, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, s

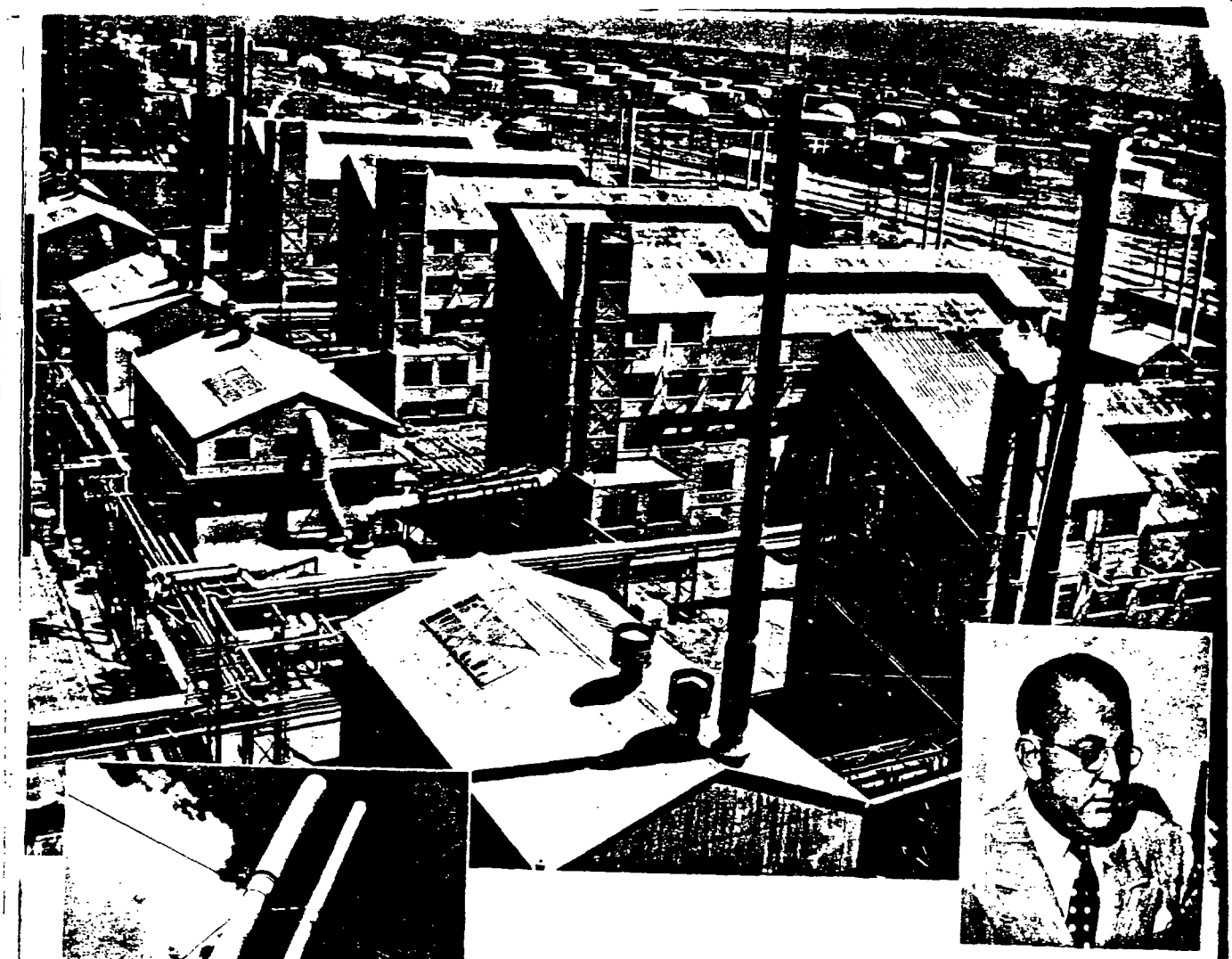
ETC 24193

Ethyl Corporation this month marks the completion of an expansion program at its manufacturing plant in Baton Rouge, Louisiana. The program, which was initiated in 1947, will provide a broad increase in the Corporation's capacity for making antiknock compounds. It is, moreover, a comprehensive undertaking that has involved not only the construction of new facilities and equipment, but also the enlargement of all the diverse operations that are involved in the production of "Ethyl" antiknock compounds.

Ethyl's program, of course, represents but a small part in the expansion which the oil industry at large has undertaken, in preparation for the future. Yet, it is hoped that Ethyl's enlarged plant will enable it to serve the oil industry even better than before, as the indicated demands for high quality gasoline are realized in the years ahead. We take pride in being able to participate in the industry's stirring march of progress, with all that it holds for the future of motorized transportation.

C. L. Shea

ETC 24194



At the top is a view of the tetraethyl lead area of the Baton Rouge plant, taken from the rear. The smaller buildings in the foreground are lead recovery units . . . Inset, a wash house that adjoins a tetraethyl lead building. Here the product is purified before it is finally blended into finished "Ethyl" antiknock fluid

Ample supplies of antikno completion of Ethyl's expansi

There is a twofold significance in the completion of Ethyl's expansion program, I believe.

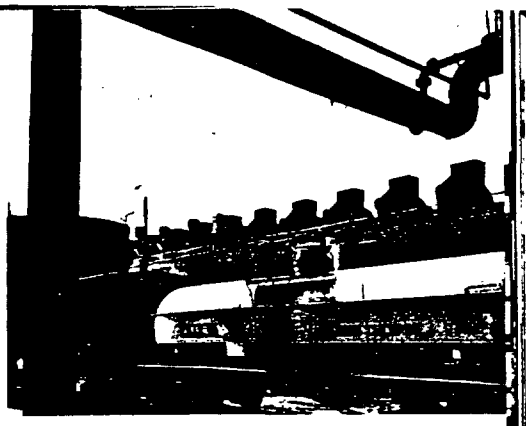
For the present, it means a substantial increase in the nation's manufacturing capacity of antiknock compounds. After a period of shortages and restrictions, refiners can now be assured of all the antiknock compound they desire.

Over the long term, Ethyl's enlarged facilities have been planned not only to anticipate the expanding demands for high-quality gasoline which have been forecast; they are also a tangible demonstration of faith in the further potentialities of gasoline – and of the new peaks of automotive efficiency and fuel economy which will be realized in the course of events.

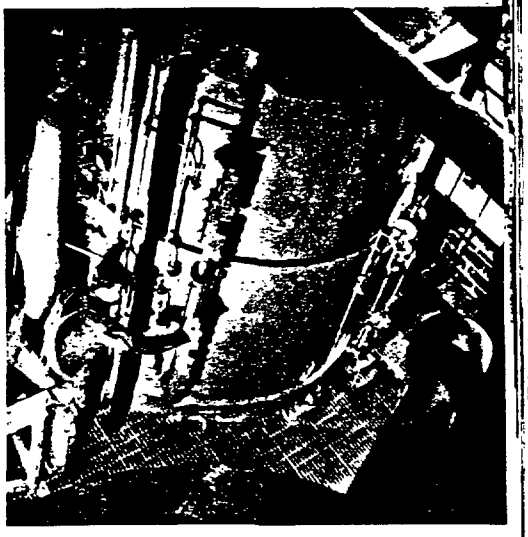
The construction program has involved the invest-

ETC 24195

Looking up at a section of the new plant for making ethylene dichloride, an ingredient of finished fluid



Framing a tank car of liquid chlorine (above) is the new wing of the sodium building



Above, a salt evaporator in the sodium area . . . Below, the new ethyl chloride plant

ockompounds now assured with

sionrogram

by John H. Schaefer, Vice President and General Manager of Manufacturing and Traffic

ment of approximately $40 million in additions and extensions to Ethyl's manufacturing capacity. We now have six separate buildings producing finished tetraethyl lead. At the same time, the new construction has brought important additions to intermediate manufacturing operations and subsidiary installations.

The successful completion of our expansion program in less than the scheduled time has been due to the efforts of many people.

Today, however, as we embark on a new and higher level of manufacturing operations, we take pride in the fact that Ethyl's Baton Rouge plant, already the largest plant of its kind in the world, will now have a greater ability than ever before in meeting the requirements of oil refiners.

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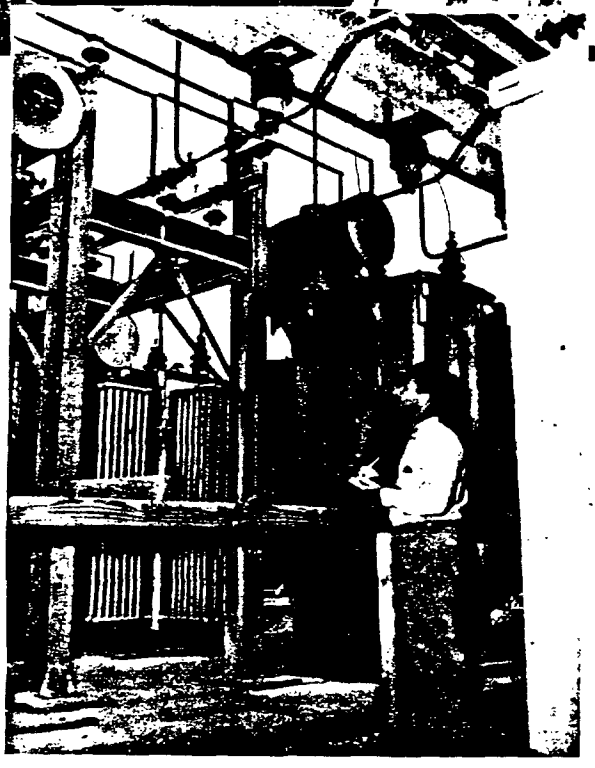
Eating its way into a mountain of lead bars at the Ethyl plant, a lift truck takes on a load for use in the manufacture of tetraethyl lead

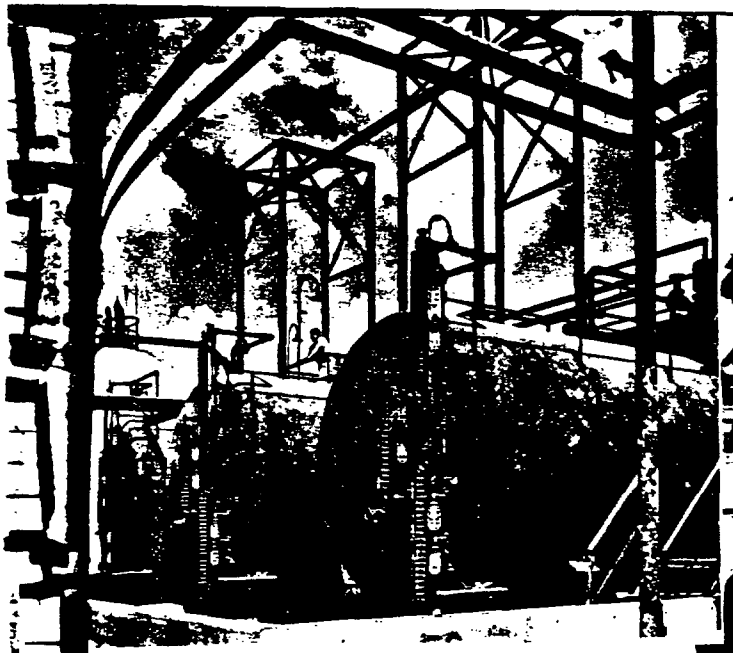


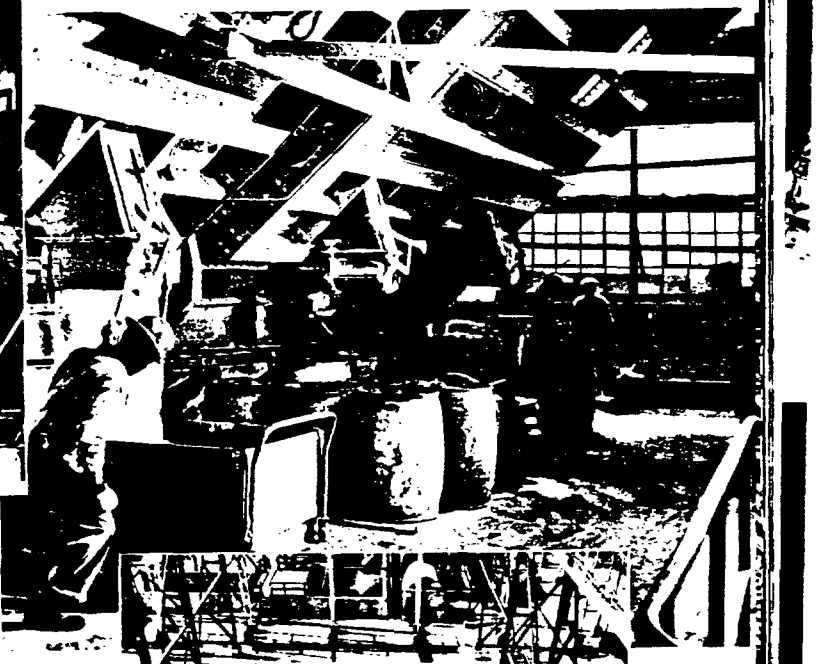
The Baton Rouge plant requires enormous amounts of electricity—more, in fact, than is needed by an ordinary city of a quarter-million population

Long range outlook fo

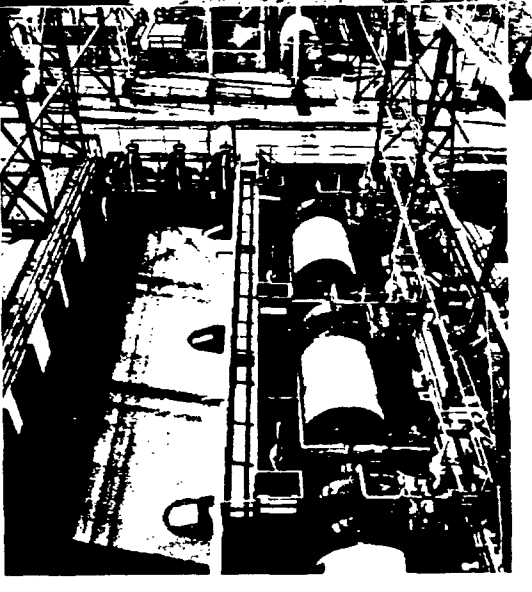
A satisfactory forecast for adequate supplies of all raw materials was, of course, required in order to justify our expansion program. Our past problems of short supply for raw materials centered principally around metallic lead. The outlook for this important raw material is now such that we anticipate no serious difficulty in the future. The situation for other raw materials is also such that there is no reason to believe that the supply of any material will set a limit to the maximum production now available from Ethyl's enlarged capacity.

Most of the raw materials used in the Baton Rouge plant are obtainable in whole or in part within a 300-mile radius of Baton Rouge. Most of the other materials are secured from sources almost immediately





Sulphuric acid, shown here in storage in new tanks of 23,000 gallons capacity each, is another important raw material. It is reacted with salt to form hydrochloric acid for the plant's ethyl chloride operations ... At the right, a storage bin is discharging salt for use in sodium manufacture



An essential ingredient in finished "Ethyl" antiknock compounds is ethylene dibromide, produced at the Ethyl-Dow plant in Freeport, Texas. At the right is a group of pumps used at the Freeport plant in the extraction of elemental bromine from sea water

(foaw materials is sound

by Joseph A. Costello,
Assistant General Manager of Manufacturing and Traffic

adjacent to the Baton Rouge plant.

Surprisingly enough, one of the most important things purchased for delivery into the plant from outside sources is electricity. To assure Ethyl of adequate supplies of low-cost power, the Gulf States Utilities Company has enlarged the capacity of its generating facilities. Large quantities of salt and salt brine, moreover, are secured from nearby mines and wells. Ample supplies of hydrocarbons are piped across the street from one of the largest refineries in the United States.

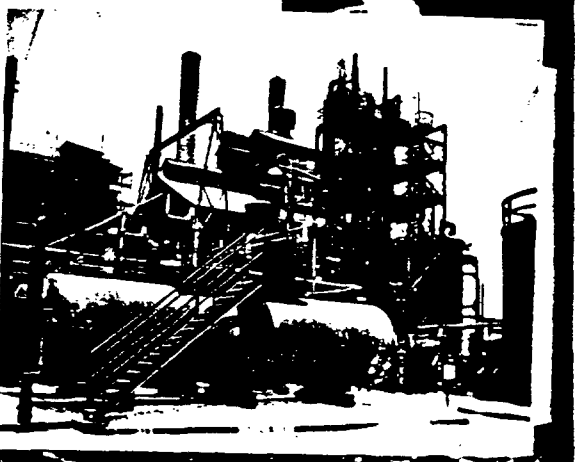
Metallic lead supplies are secured from three sources: domestic and foreign producers, and recovery of lead scrap. In each of these three fields, Ethyl has commitments for continuing supplies which promise to be adequate and satisfactory. While the manufacture of antiknock compounds for gasoline is now listed as the fourth largest industry in the consumption of metallic lead, the total capacity of the Baton Rouge plant will represent less than 10% of U. S. lead consumption.

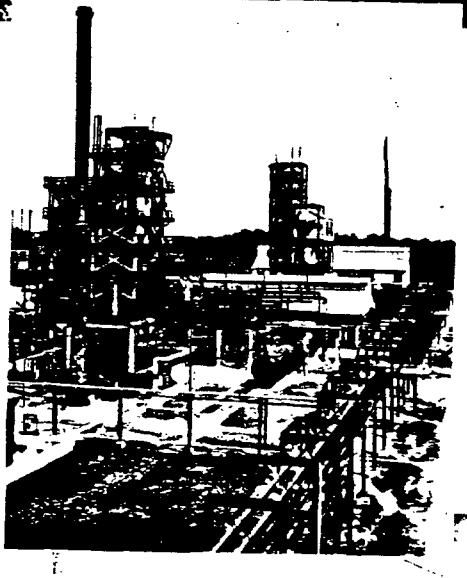
Ethyl Corporation is in a fortunate position with respect to raw materials also by virtue of the nature of its manufacturing plant. Because of its integrated operations, the Baton Rouge plant is able to supply its own needs, in whole or in part, of sodium, hydrogen chloride, ethyl chloride and ethylene dichloride.

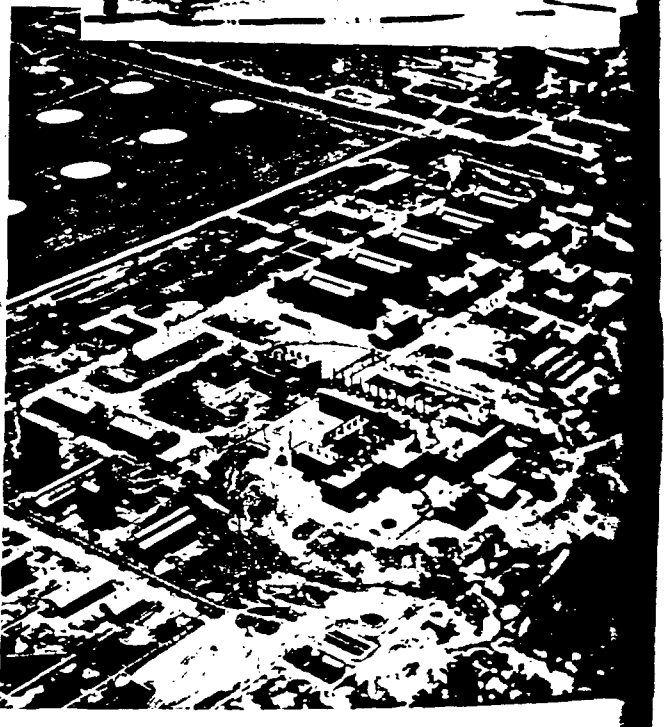
The new and expanded facilities are responsible for making these intermediate chemicals available to us in greater volume than ever before. Together with the progress achieved in other directions, they will help translate our new production goals into a reality.

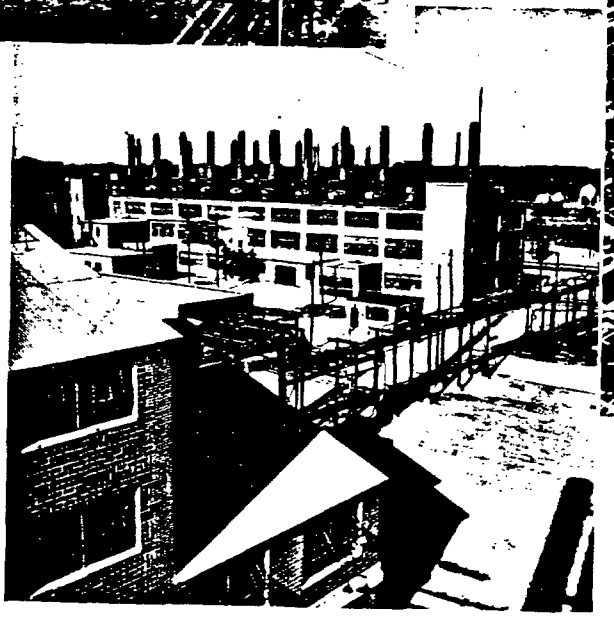
ETC 24198

The group of buildings, top left, that comprised the Baton Rouge plant in 1938, occupied but a corner of the present 200-acre tract . . . Directly beneath them is the No. 1 ethyl chloride plant, which went on stream in 1939 . . . At the bottom left is the original sodium building

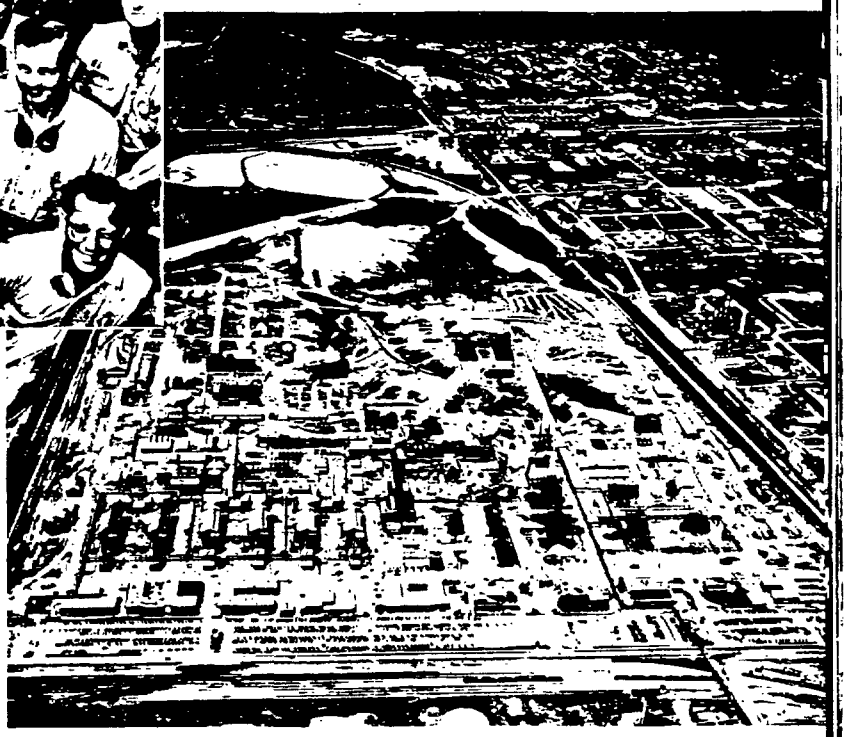








Among important wartime additions were the water purification system (top) and the hydrochloric acid plant (center) . . . Bottom, a view of the plant just before the present expansion



Practically all of the more than 3,200 employees at the Ethyl plant are skilled workers . . . At the right is an air view of the plant today

Ethyl's new facilities mark a major milestone in growth

by Clinton W. Bond,
Resident Manager

The thirteen years in which Ethyl's manufacturing plant has been located at Baton Rouge have been a period of continual growth. In that time we have seen Ethyl's plant take root and develop into the world's major source for gasoline antiknock compounds.

We first broke ground in October of 1936, and the first tetraethyl lead building was completed eleven months later. In 1938, we placed the second tetraethyl lead building into operation, and during the same year our first ethyl chloride unit went on stream.

That early group of buildings occupied only a small corner of our present 200-acre site, but it was the nucleus of vigorous growth. Within another year we had added the third and fourth tetraethyl lead buildings, began producing sodium for our manufacturing needs, and finished another ethyl chloride building. Later, the scene changed again, with a fifth tetraethyl lead unit and a third ethyl chloride plant built.

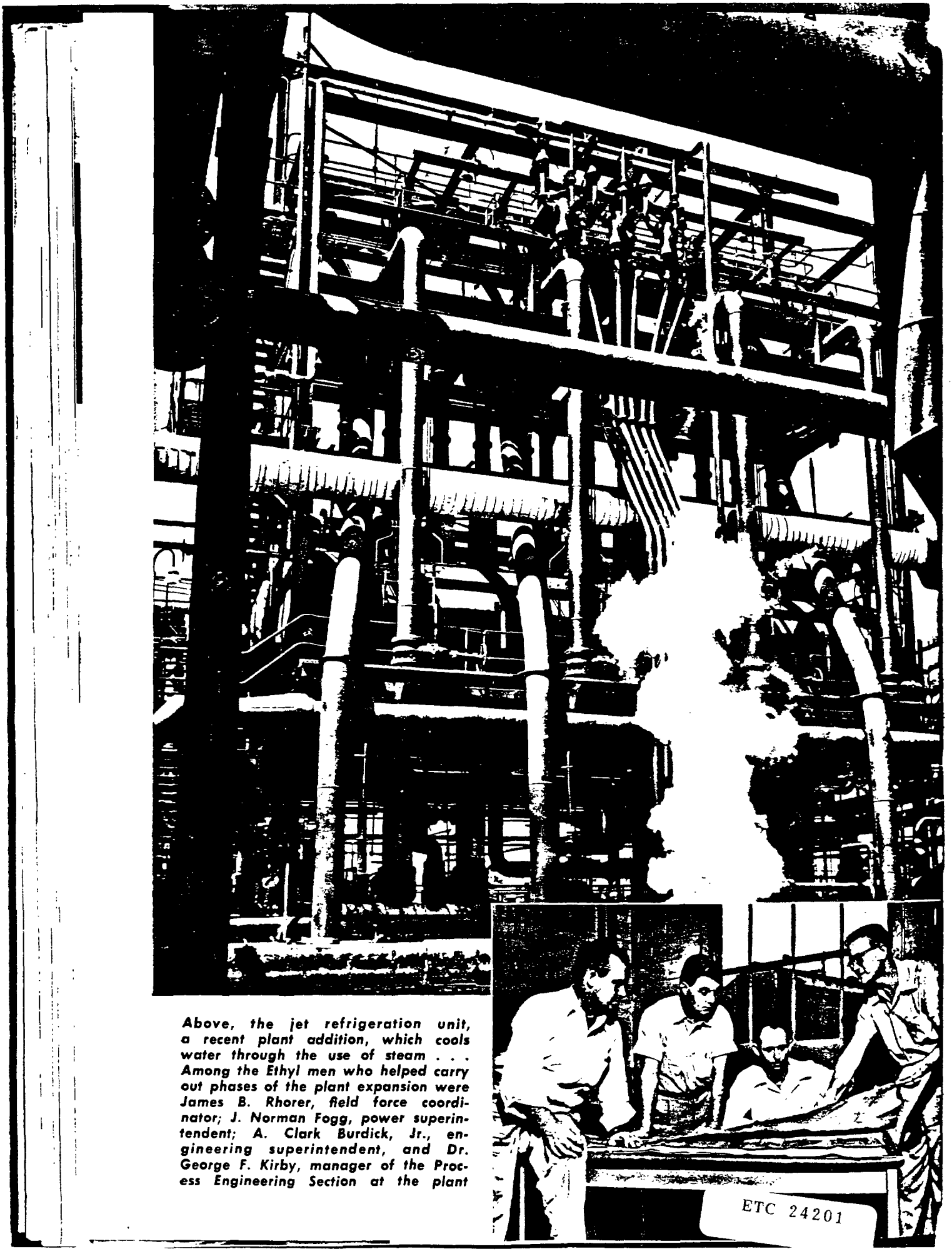
That fifth tetraethyl lead building, by the way, has an interesting history. It was completed in 1941, as part of Ethyl's established policy of anticipating future requirements as far into the foreseeable future as possible. The building, however, was kept in stand-by condition until August of 1943, when it was first needed to help meet the ascending wartime requirements for antiknock compounds.

Since the war, of course, there have been important additions to our plant, which have helped increase our operating efficiency and total production. In fact, looking back over a period of years, the increased operating efficiency achieved with our existing facilities has enabled us to greatly increase our unit productive capacity.

At the same time, the number of employees has grown to more than 3,200 people, with several hundred additional jobs expected to be created ultimately by the enlarged facilities.

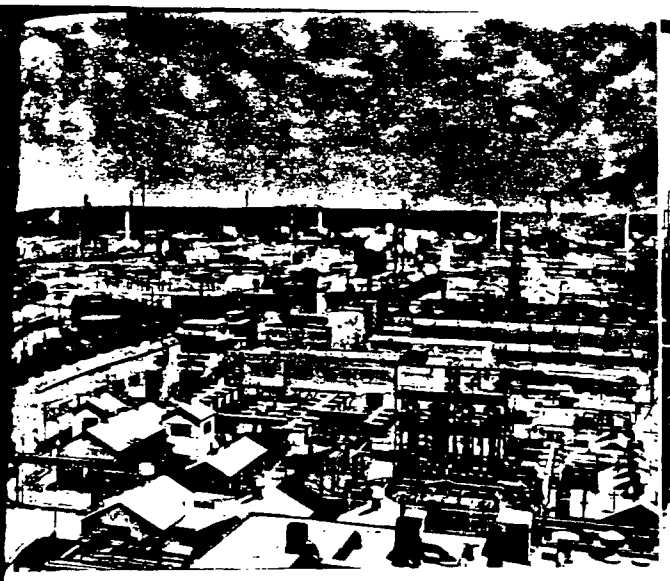
The present expansion program represents the accomplishment of a long-desired goal, and marks a major milestone in our growth and progress.

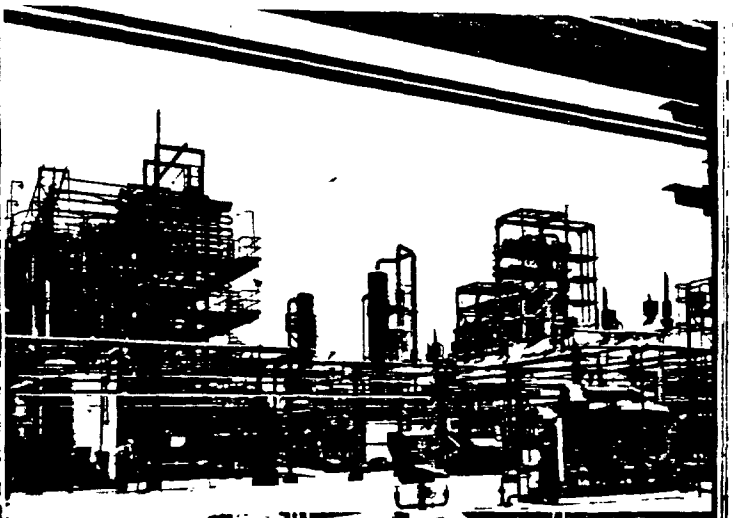
ETC 24200

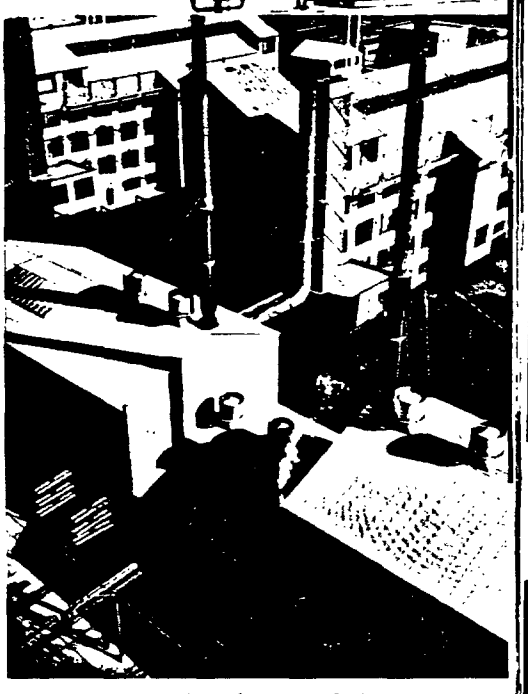


Above, the jet refrigeration unit, a recent plant addition, which cools water through the use of steam . . . Among the Ethyl men who helped carry out phases of the plant expansion were James B. Rhorer, field force coordinator; J. Norman Fogg, power superintendent; A. Clark Burdick, Jr., engineering superintendent, and Dr. George F. Kirby, manager of the Process Engineering Section at the plant

ETC 24201







All three major operating areas — sodium (above), ethyl chloride (above right), and tetraethyl lead (right) — have been enlarged as a result of Ethyl's expansion program

All plant areas affected by extensive additions

by B. Bynum Turner, Assistant Resident Manager

The size, scope and complexity of expanding the company's manufacturing operations in Baton Rouge have brought about the most comprehensive building program to be carried out since the plant first went on stream.

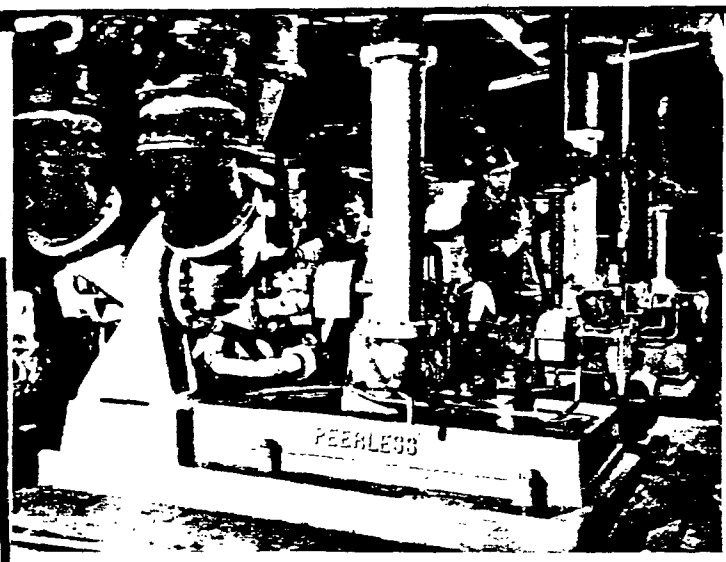
Some idea of the size of the undertaking is indicated by the $40 million invested in the program as a whole, including a substantial amount for the improvement of existing facilities and equipment. The largest expenditures were for a third wing to the sodium plant, a sixth tetraethyl lead building, and a fourth ethyl chloride manufacturing plant, as well as extensive auxiliary installations, service requirements, and accommodations for employees.

It is perhaps more significant to point out that we are the world's largest producers of sodium and ethyl chloride, as well as tetraethyl lead, and that we manufacture most of the nation's supply of each of these chemicals. Such diversified and complex operations require a number of installations unusual in size and variety.

Tetraethyl lead operations require custom-built autoclaves, stills and other equipment, and unique types of buildings. The manufacture of metallic sodium by the electrolysis of salt calls for some of the most interesting installations in the field of industrial chemistry. In the manufacture of ethyl chloride by the hydrochlorination of ethylene, the plant operates not only the first refinery-type structures of their kind, but the largest and most modern ones.

Technological aspects of the project were necessarily in keeping with the size and intricate nature of the undertaking at large. This work involved extensive and coordinated efforts on the part of our research and development laboratories, our process engineers, our engineering and maintenance section, operations

ETC 24202

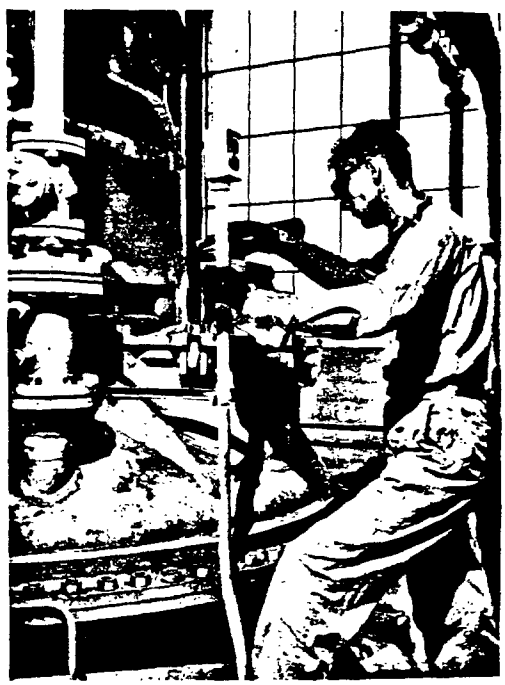


Above are turbines and pumps for the new brine evaporators in the new sodium wing

section representatives and other plant groups.

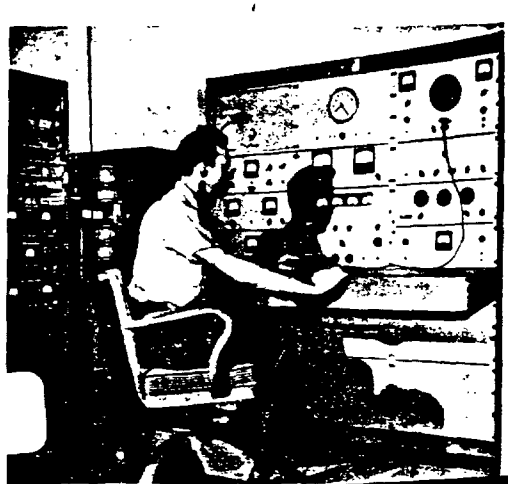
The successful conclusion of the expansion program owes a great deal to the 3,500 Ethyl personnel and employees of our contractors who put in at least 5 million man-hours on the job. At least another 5 million man-hours were spent by material and equipment manufacturers and suppliers.

Ethyl Corporation's ability to contribute to the progress of motorized transportation has been strengthened by the millions of man-hours worked by those who helped plan, design, build, and equip our enlarged plant. The added experience gained by our personnel through their work on the expansion program will be one of our more important assets in the future.



Top, additional hydrogen chloride burners like this have been installed . . . Above, testing a still in the new tetraethyl lead unit

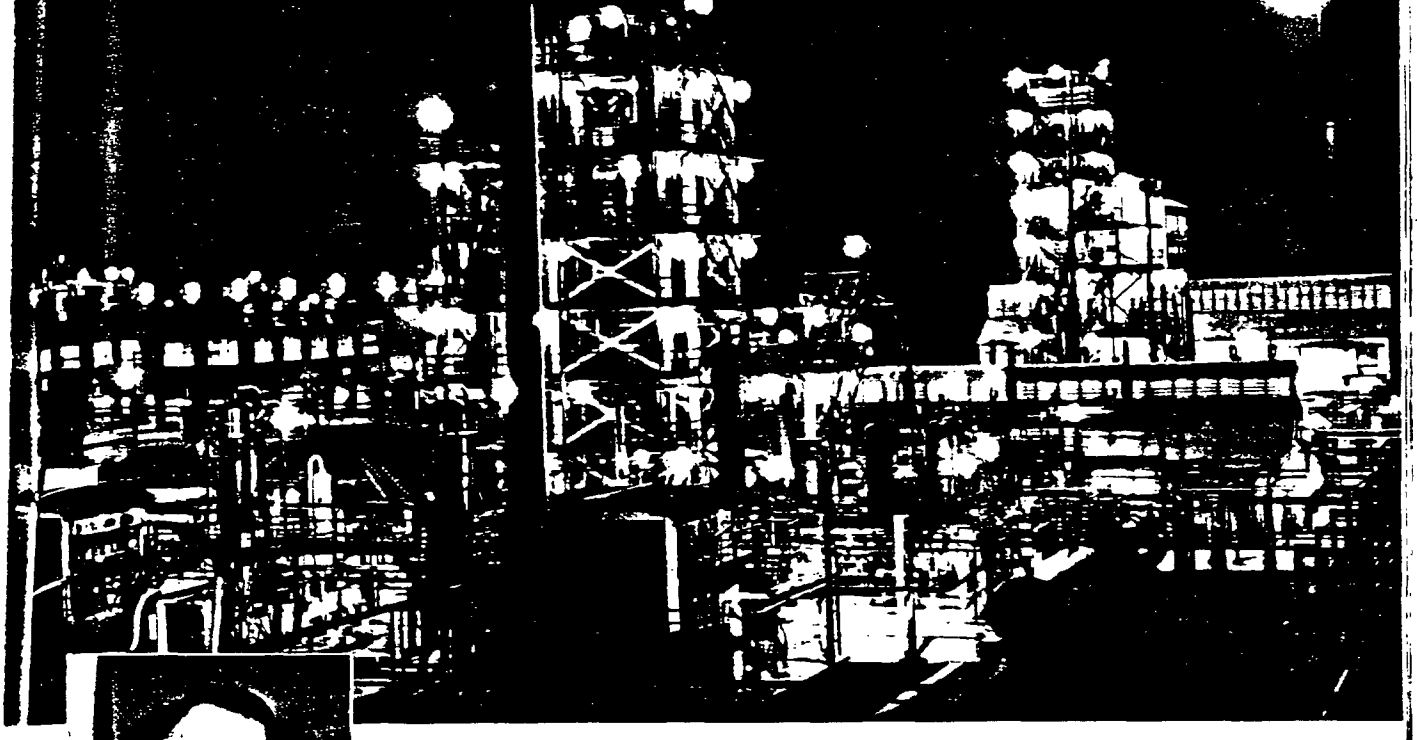
Below, the newly-completed laboratory for manufacturing development . . . Center, Dr. George W. Beste, manager of the Development Section . . . Right, among the Development Section's equipment is this mass spectrometer



ETC 24203

It takes "three plants" to manufacture "ETHYL" antiknock fluid

by Roy N. Clothier,
Manager, Operations



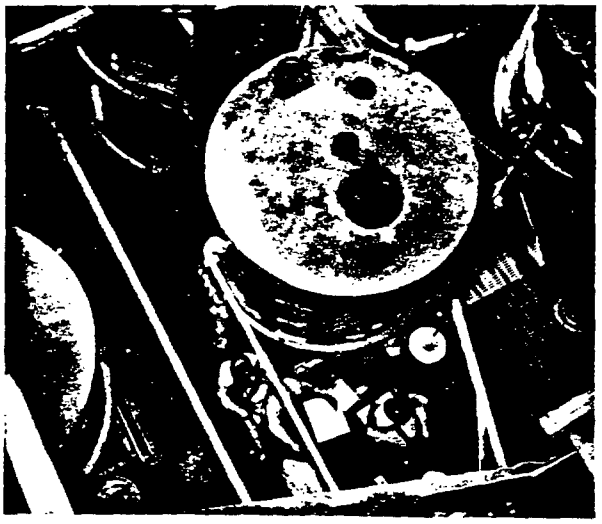
The ethyl chloride area makes this interesting pattern of lights during its night-time operations

One of the interesting characteristics of the Ethyl plant is that it is actually three plants in one. These "three plants" are operated separately, each by its own individual processes and methods, and yet collectively they are all concerned with some important phases of the manufacture of "Ethyl" antiknock compounds.

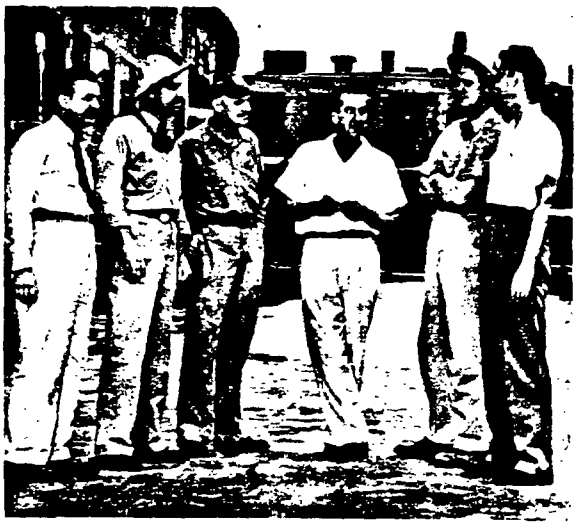
Consequently, in considering our expansion program from any point of view, it was axiomatic that we provide for close coordination between operations in each of the three plant areas. The integrated nature of the plant as a whole requires production schedules for these areas in direct relationship to projected increases in the amount of "Ethyl" antiknock compounds we expect to manufacture.

Tetraethyl lead, of course, is the principal ingredient of "Ethyl" antiknock fluid, but its production requires a number of intermediate chemicals and chemical processes. Virtually all of these intermediates are made at our Baton Rouge plant. New installations and equipment therefore have had to include additions and improvements not only to the tetraethyl lead area but to the sodium and ethyl chloride areas as well, where the necessary materials are manufactured. It also follows that closely coordinated efforts were necessary in the planning, designing and

Operating superintendents of the Ethyl plant are: Harold W. Wheeler, tetraethyl lead; Glenn O. Hayes, sodium; and Wallace F. Armstrong, ethyl chloride



Each set of salt evaporators, in the sodium area, makes 150 tons of salt daily

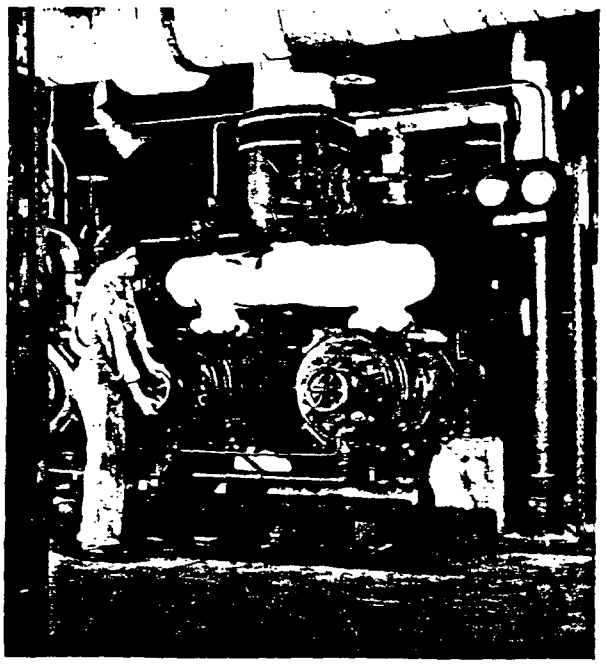


Close coordination by Ethyl's operations supervisors expedited the expansion program. Above are Jasper F. Kobler, Jr., sodium; Dr. Arthur J. Haas, Jr., ethyl chloride; Leonard H. Tomlin, sodium; Harry F. Royal, tetraethyl lead; Grant A. Brummett, ethyl chloride; and Frank McCoy, tetraethyl lead

building of all production units within each individual area.

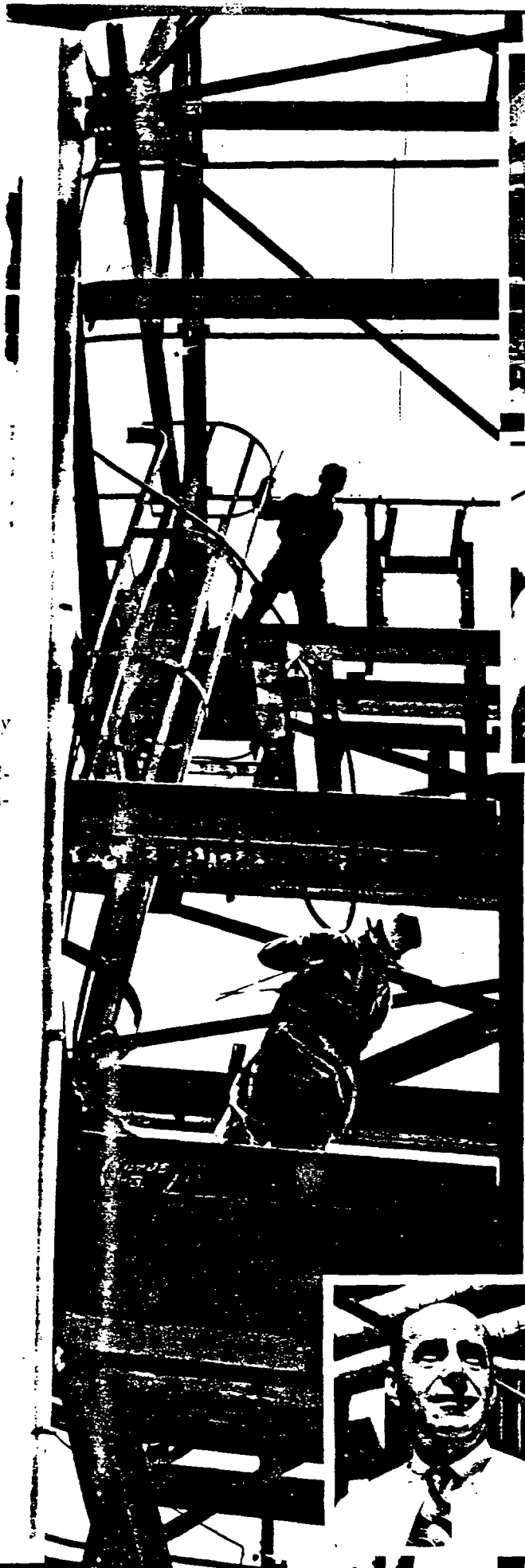
During the past two years, while the expansion program was under way, we have managed to continue all area operations without major interruptions or delays. Actually we were able to increase the amount of "Ethyl" antiknock compounds produced by 30%. Part of this increase has been due to improved processes and equipment introduced as a result of normal growth in our knowledge and experience, and partly by improved methods of operation.

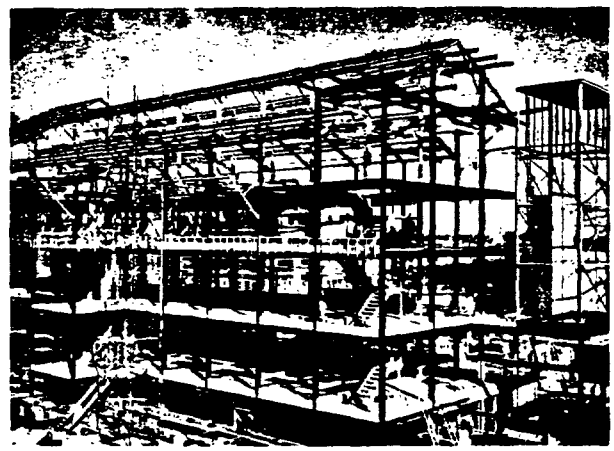
Our installations are now so complete and so modern that we anticipate greater simplicity and smoothness on all operational levels in the years ahead.



Adjusting the compression ratio of an ethylene compressor in the compressor house

A hopper of lead-sodium alloy is carried from the new wing of the alloy building



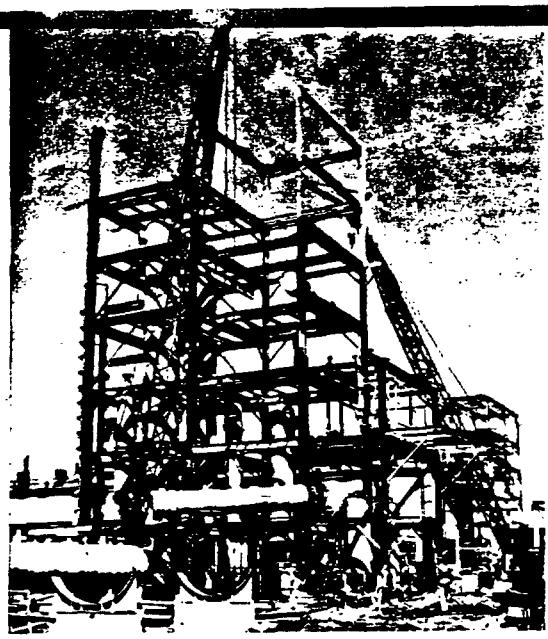


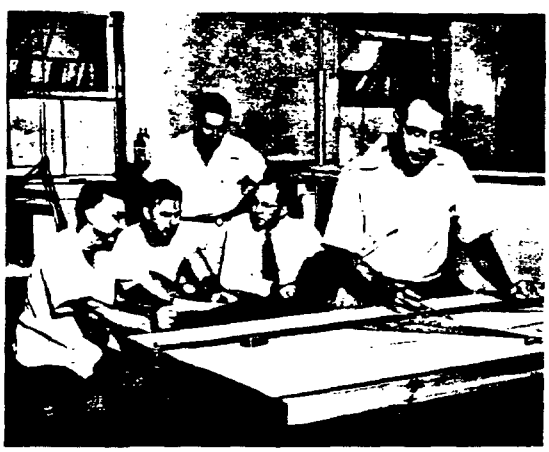
Coordinated engineering and construction plan facilitates general program

by William J. Henry, Manager, Engineering and Maintenance

One of the first steps in the expansion program was the allocation of various designing, engineering and construction projects among our own groups at the plant, and among the various contractors employed on the over-all job. This dual arrangement, although presenting some problems, proved to be an efficient and economical way to push ahead simultaneously on a number of fronts.

Left, William J. Henry . . . Above, Melvin Hudgins, maintenance superintendent; Leslie Price, assistant maintenance superintendent; Norman Weaver, principal plant construction foreman; and Stanley D'Armond, plant expansion construction supervisor





The Process Engineering Section first prepared engineering and production studies. It designed new process equipment and drew up new or revised specifications and flow diagrams as required, in cooperation with the Operations Section. Then subsequent engineering assignments were turned over either to our own Engineering Group or to outside engineering firms.

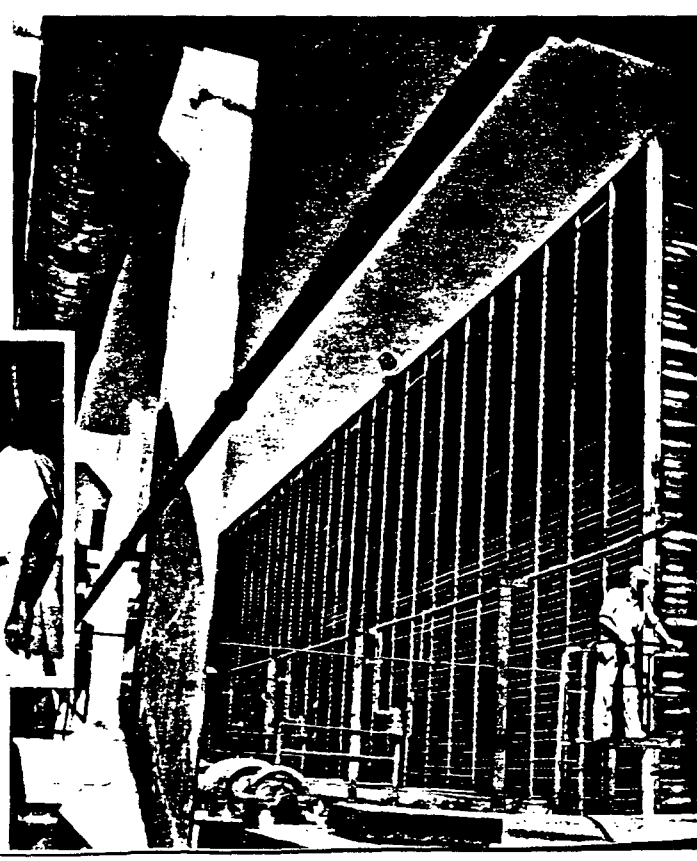
Among the principal projects undertaken by our own engineering and construction forces were designing and building new cells for the sodium building, and converting existing cells to higher capacity. New maintenance and repair shops and some general new facilities were also designed and built by our own men.

The Stone and Webster Engineering Corporation was in charge of constructing the principal new buildings and other operating units, as well as the installation of process equipment, the jet refrigeration plant, utility lines, substations and other general services. Ethyl representatives worked closely with Stone and Webster and other engineering and contracting firms in the coordination of their work with ours.

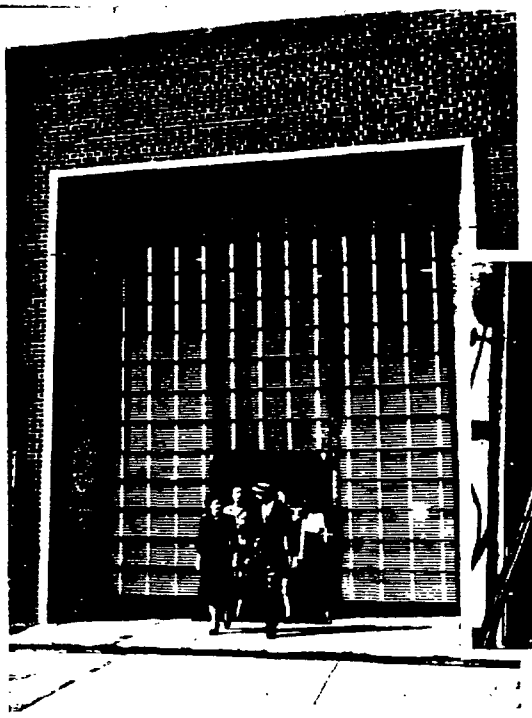
The first major units of the expansion program to be finished were the ethyl chloride and ethylene dichloride plants, which were ready for operation early in October. Final installations were completed in the new tetraethyl lead building shortly afterward. Work in the sodium building will be completed before the end of this month.

Top, a heat exchanger is hoisted into place in an ethyl chloride unit . . . Above, process engineers Henry H. Wall, Jr., Frank V. Canfield, Arthur H. Middleton, Thomas M. Smylie, and Dr. Harry E. O'Connell, who prepared process designs and specifications

Right, this new water cooling tower in the tetraethyl lead area can cool as many as 32,000 gallons per minute



These Engineering and Maintenance Section men — W. Gerald Whitley, Claude E. Daviet, and E. W. Kleinpeter—supervised installation of the elaborate electrical equipment of the new sodium wing

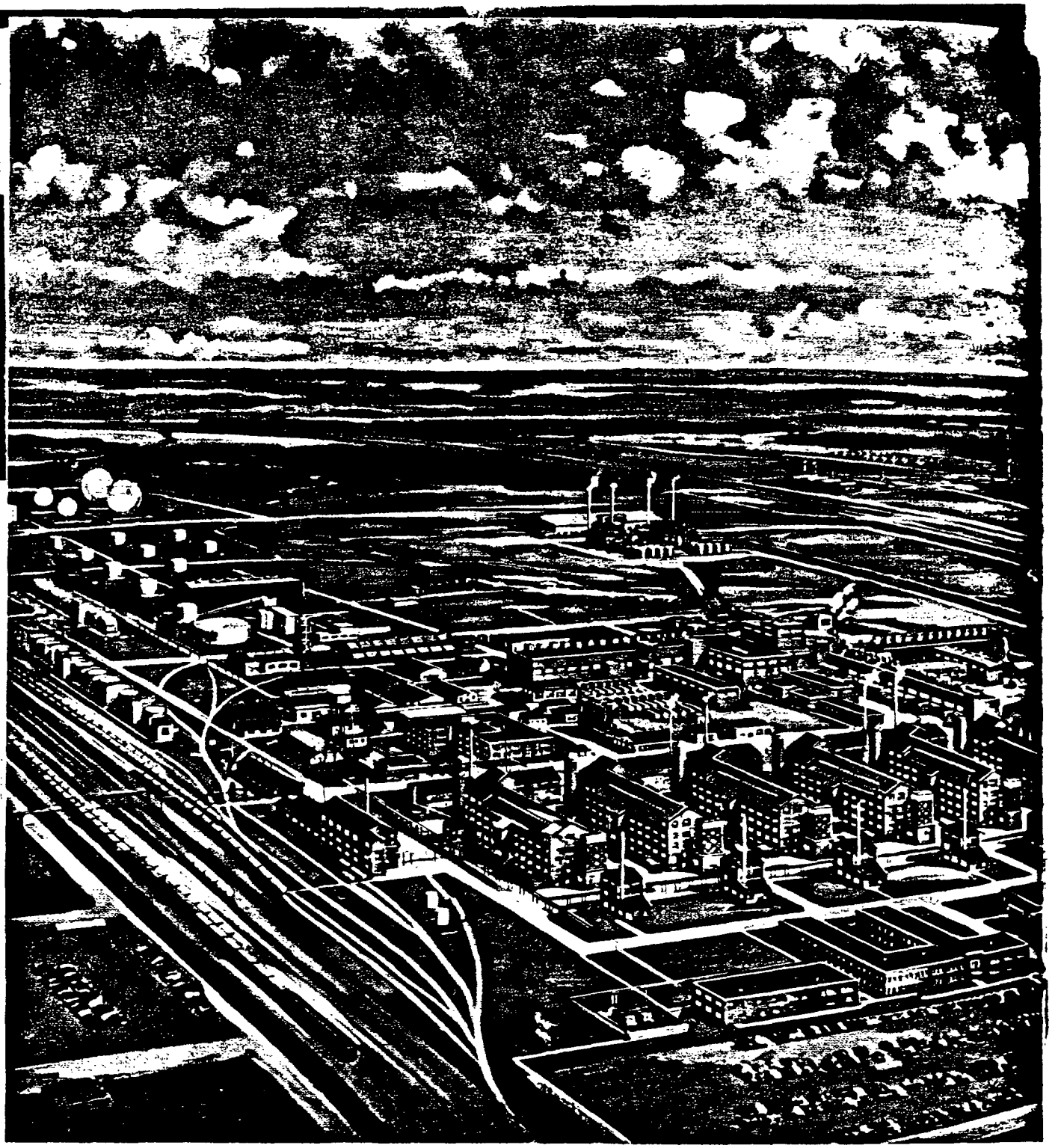


Right, entrance to the new medical and personnel building, a modern air-conditioned structure which provides the latest medical equipment and facilities for employees. The building also houses other employee service groups and some of the plant's administrative offices

Stretching out and around the new lead recovery building are these huge exhaust ducts. The ducts ventilate the lead recovery furnace and the sludge pit inside

Above center, a new salt conveyor system leading to the sodium cell room . . . Above, two workmen line up a motor and reduction gear used in connection with a tetraethyl lead still

ETC 24208



ANTIKNOCK CITY: ETHYL'S MANUFACTU

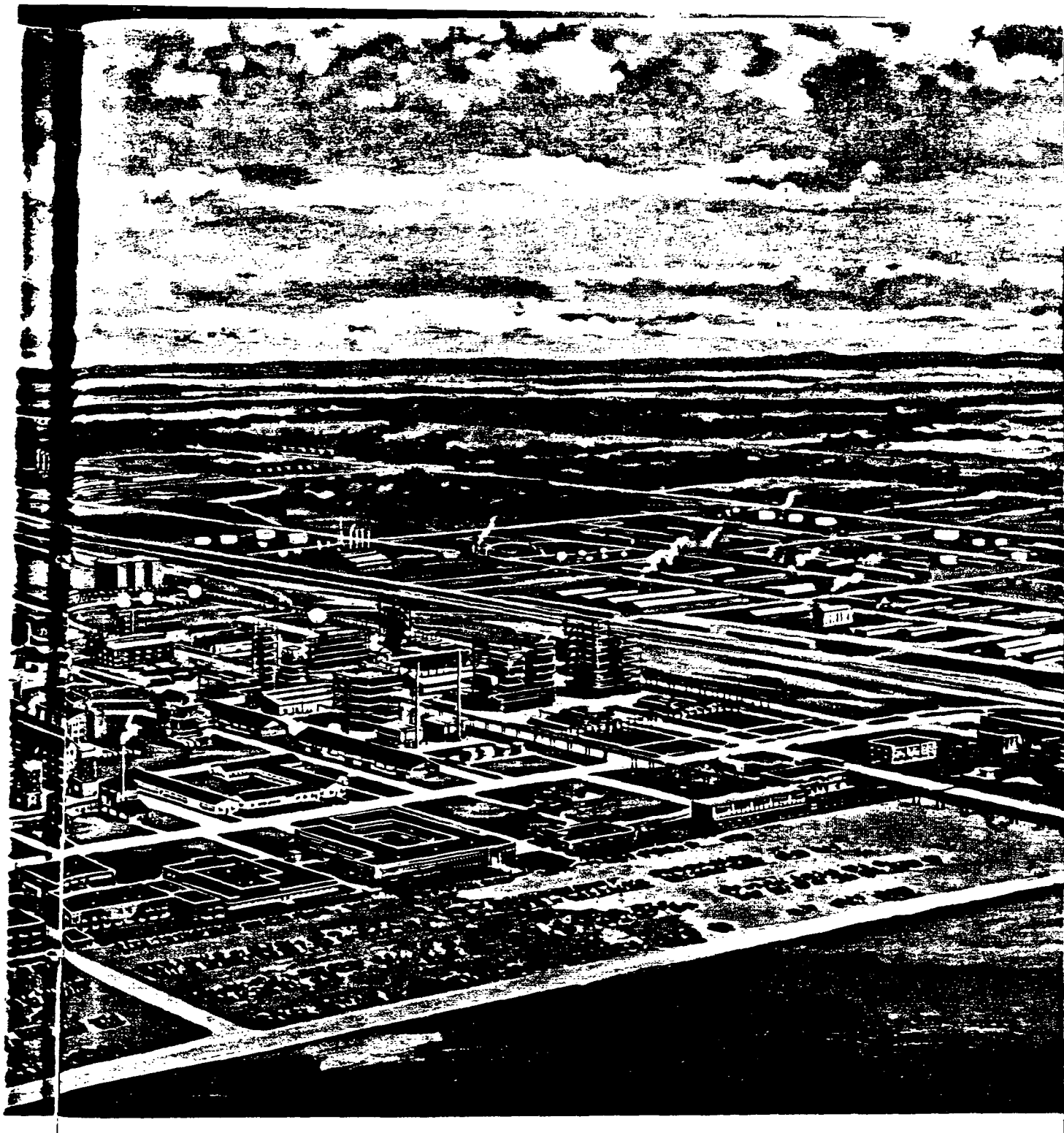
TO GET THIS PICTURE of the Ethyl plant, a group of artists and engineers assembled over 100 photographs, and from them prepared this "industrial portrait."

It minimizes surrounding properties but faithfully represents, in proper perspective, virtually every detail of the world's largest center for the manufacture of antiknock compounds.

A whole community of chemical manufacturing units is required to take raw materials through the numerous chemical reactions leading to the final blending of "Ethyl" antiknock compounds. These operations are conducted in three principal areas, where ethyl chloride, sodium and tetraethyl lead are made.

The row of five-story buildings on the lower left of the portrait are for tetraethyl lead manufacture. The new one is at the right. Blending, storage and shipping operations for finished "Ethyl" antiknock compounds adjoin the railroad sidings.

ETC 24209



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Dominating the left center of the portrait is a large unit with three wings and rows of ventilators on the roofs — the sodium building. Here common table salt is turned into metallic sodium and chlorine gas. The wing on the left is the new addition.

On the right, the refinery-type units with open structural steelwork make ethyl chloride, used in the manufacture of tetraethyl lead, and ethylene dichloride, which is blended with tetraethyl lead to make "Ethyl" fluid. The newest ethyl chloride plant is on the far right. In back of the area is a three-unit cooling tower. In the left background, a hydrochloric acid plant is identified by its four stacks.

Facing the parking lot in the foreground, from left to right, are an employee change house, administration building, main gate, engineering office and change house, cafeteria, and the new medical and personnel building. At the extreme right is the new development laboratory and pilot plant area.

ETC 24210

Added tetraethyl lead capacity forms the core of Ethyl's plant expansion

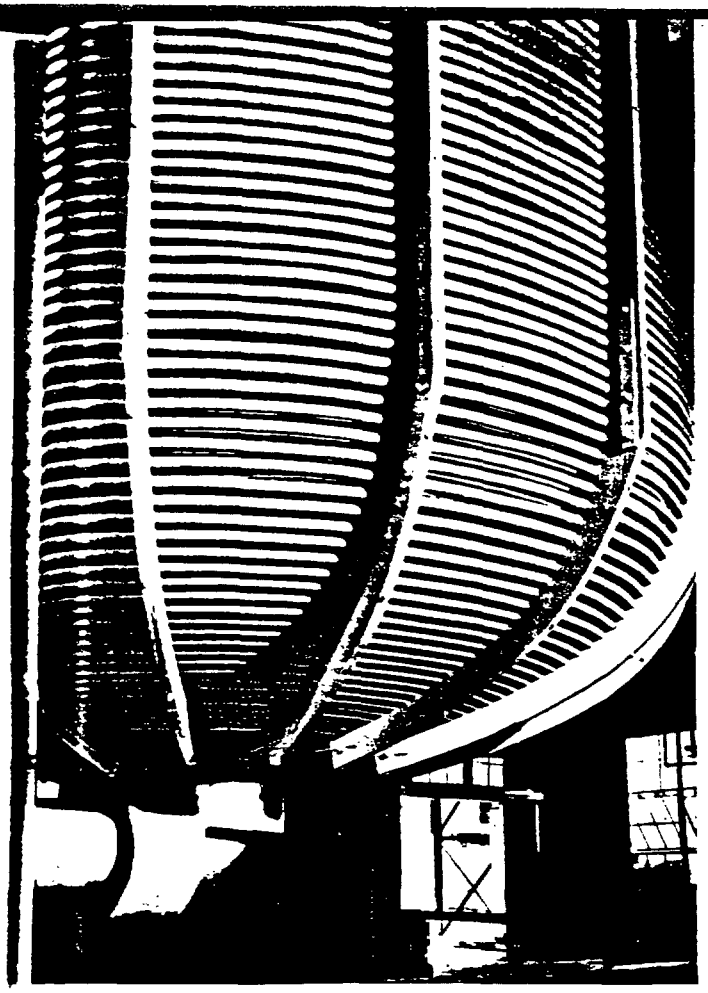
Top, an over-all view of the tetraethyl lead area with its six separate manufacturing units. The newest plant can be seen in profile in the foreground. . . . Above, a closeup of the new unit, showing a part of its ventilating system

The new tetraethyl lead facilities are of especial significance at this time. Going into operation shortly after the plant produced its 1,250,000,000th pound of tetraethyl lead, the new facilities will play a major role in enabling Ethyl to reach its new production goals.

Besides the new tetraethyl lead unit, a number of other major additions have been made in the area. These include a new lead recovery operation, a new wing to the lead-sodium alloy building, additional electric power and water-cooling installations, and a new facility for recovering ethyl chloride left over from its initial reaction with the lead-sodium alloy.

In the TEL area, whose operations of course are closely integrated with those of the ethyl chloride and sodium areas, tetraethyl lead is produced by the reaction of ethyl chloride with a lead-sodium alloy.

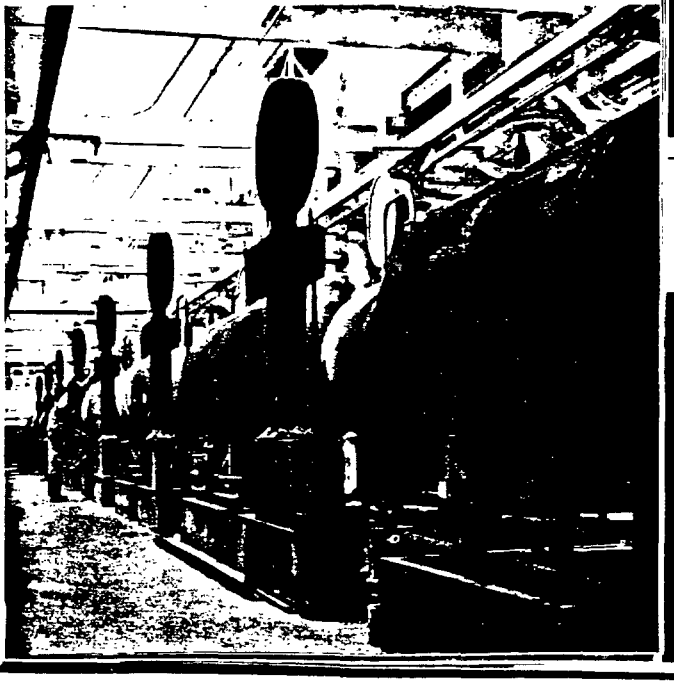
ETC 24211



Seemingly suspended in mid-air, this huge manufacturing pot in the alloy building combines lead and sodium in exact proportions to make the alloy. The pot has a 110,000 pound capacity

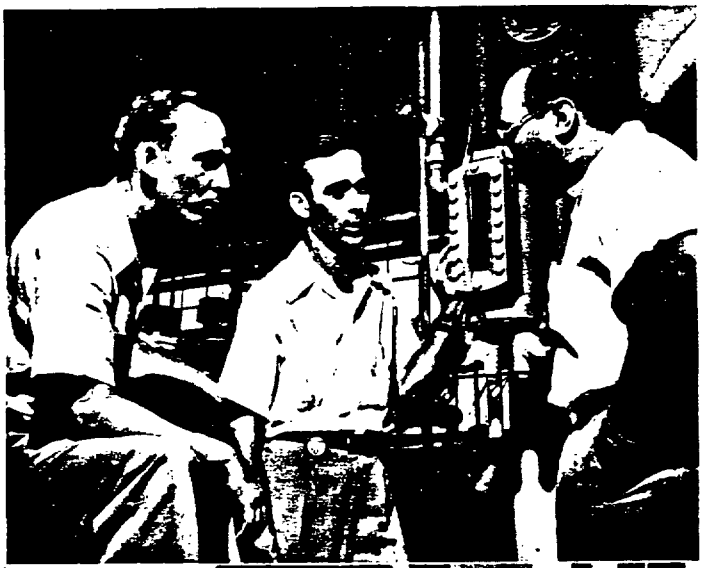
This is a 36-foot long section of one of the three new cooler trains in the alloy building. Here the alloy is vibrated uphill in the enclosed train

The scale tanks in a TEL building, where ethyl chloride is fed into the autoclaves for the reaction with the lead-sodium alloy



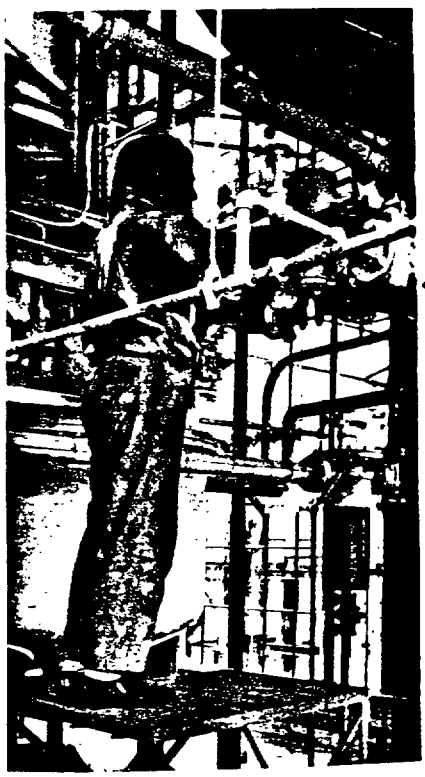
Hoppers filled with the alloy are carried to each of the tetraethyl lead buildings and fed into the autoclaves. Measured amounts of ethyl chloride are added, and the reaction takes place under controlled temperatures and pressures. After the reaction has been completed, the product is distilled with steam to separate the tetraethyl lead from the mixture. Raw tetraethyl lead is next transferred to the wash house, a smaller auxiliary building, where it is purified by treatment with water and air, and then filtered. Thereafter the antiknock agent is passed on to the blending plant, where it is mixed with ethylene dibromide, ethylene dichloride, and dye, to form finished "Ethyl" antiknock compounds. The new additions in the tetraethyl lead area will mean not only increased productive capacity but also heightened operating efficiency.

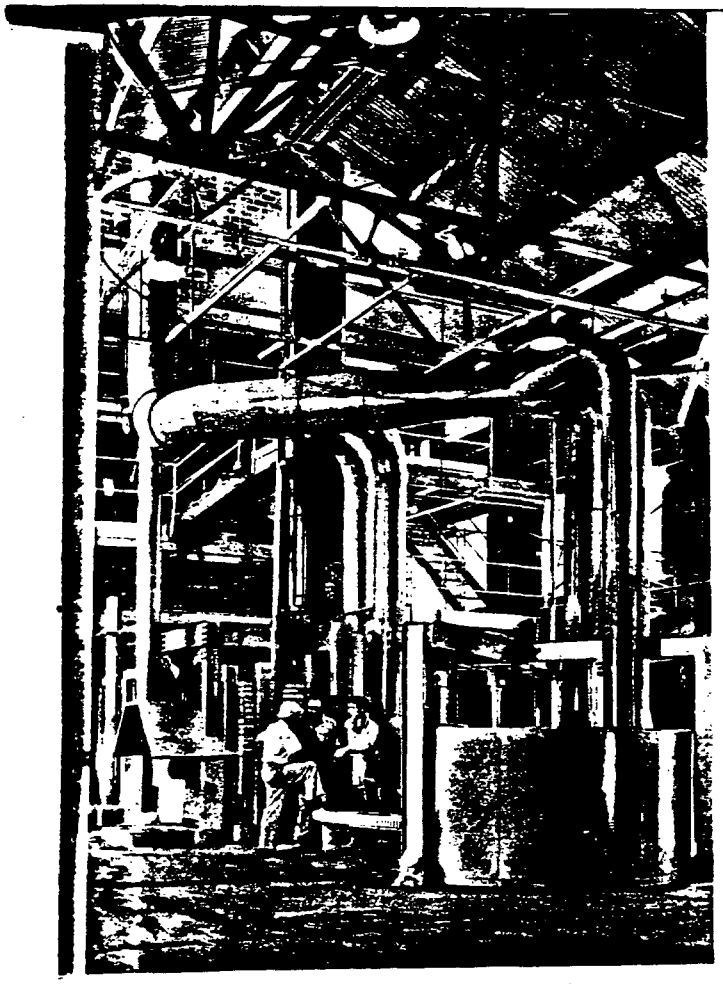
Among the Engineering and Maintenance men charged with designing and building the new tetraethyl lead unit were Ferd B. Kramer, assistant construction supervisor, and Robert L. Guidry and Sam J. Pecoraro, both of whom are senior design engineers

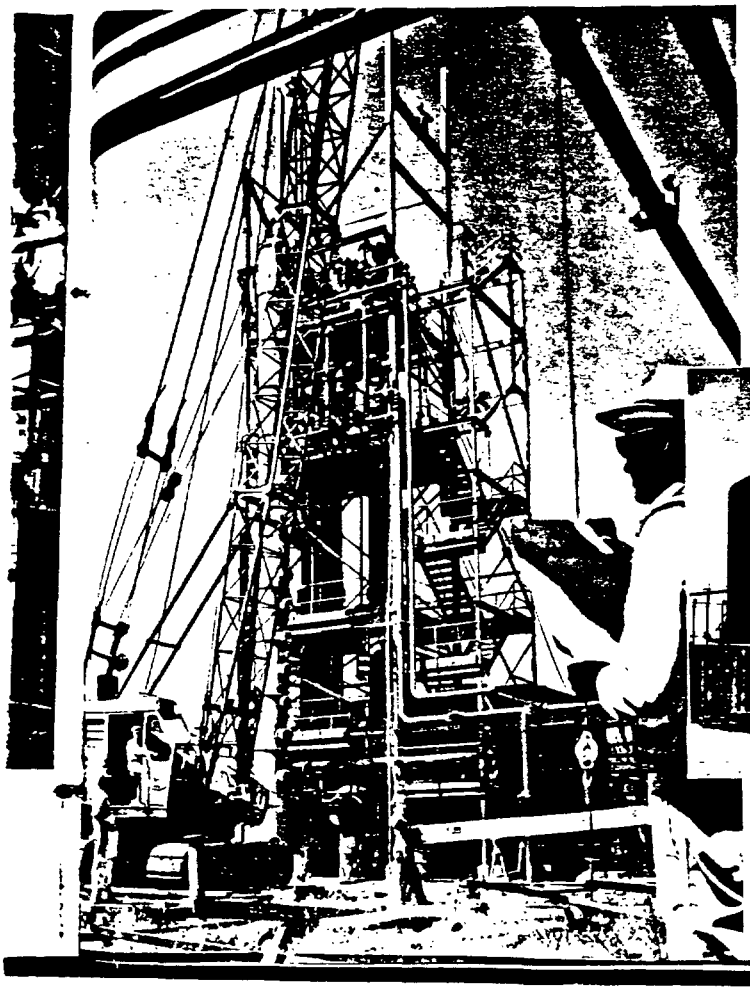


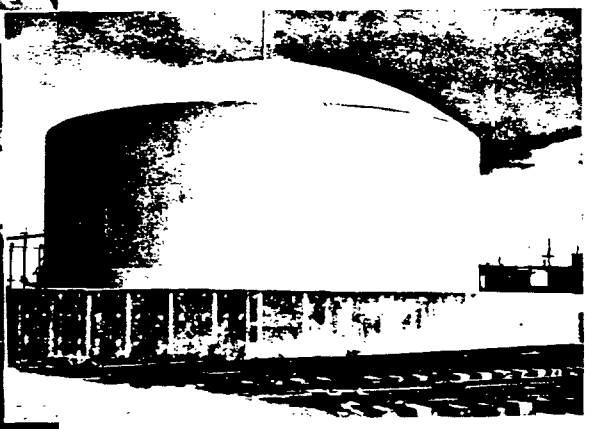
Process engineers who worked on the new TEL building and the general TEL area expansion included James M. Gill, Robert H. Marshall and H. M. Rodekohr

Below left, the underside of the stills in the new TEL building, where the tetraethyl lead is distilled with steam . . . Right, an operator at work in the washhouse, where tetraethyl lead is purified





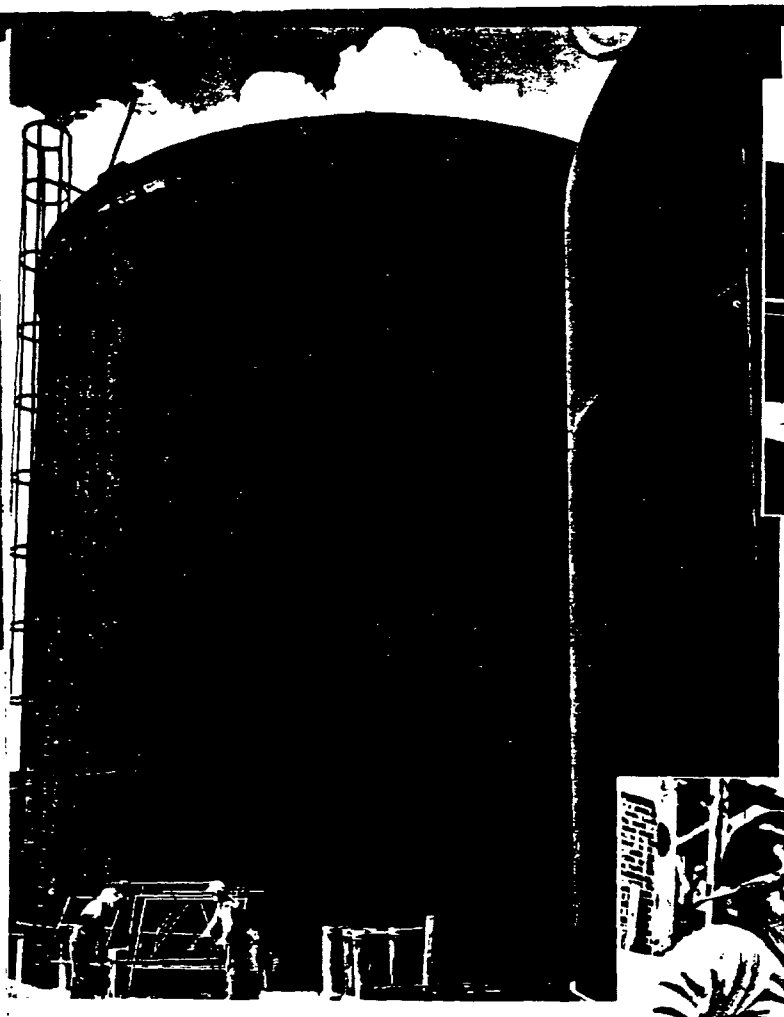




Above are interior and exterior views of the new lead recovery building. At the left is the furnace where recovered lead is re-melted and re-cast into bars . . . The tall vessel, right, is a scrubber for recovering lead particles

Left, assembling a new unit for the purification of recovered ethyl chloride . . . Below, this storage tank for "Ethyl" antiknock compounds is a recent addition to the plant's reserve storage area. It has a storage capacity of more than 7 million pounds

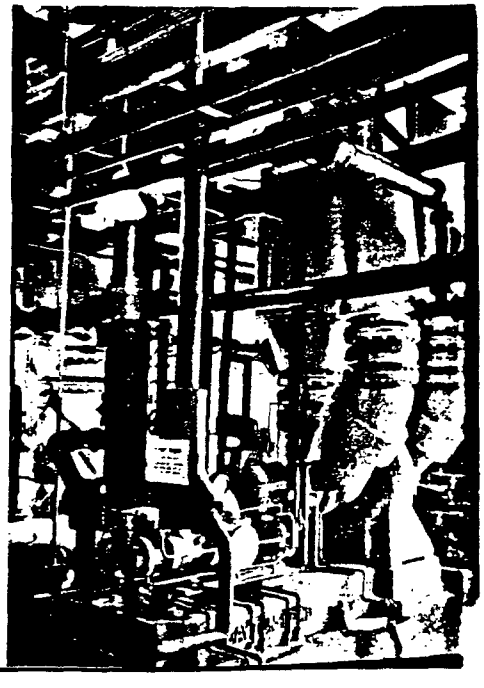
ETC 24214



Left, a section of the enlarged brine storage area. Each of these storage tanks can hold 510 tons of brine . . . Above, looking along one of the three wings of the sodium building

Process engineers Gerald L. Rice and Arthur B. Wintringham handled phases of the sodium and chlorine expansion

New sodium installations increase capacity 50%



Depicting phases of salt preparation, prior to its decomposition into sodium and chlorine, these pictures show, in order, pumps feeding brine to the evaporators, a control panel in the evaporator area, a salt filter, and finally a salt dryer. The salt must be thoroughly dried before it can be charged to the sodium cells

ETC 24215

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Strange as it may seem to the layman, the two basic elements in common salt – sodium and chlorine – are essential for the manufacture of "Ethyl" antiknock compounds. The Ethyl plant produces the two elements by the electrolysis of molten salt heated to high temperatures in an improved type of sodium cell, of which it has an unusually large number. They are in continuous operation.

The plant's requirements for additional quantities of sodium and chlorine are being met by a third battery of cells in the sodium building, and by redesigned and rebuilt cells in the other two wings. Ethyl's anticipated production represents an increase of approximately 50% over the amounts of sodium and chlorine we formerly manufactured. Some of our sodium will now be available to other industries, over and above our own requirements.

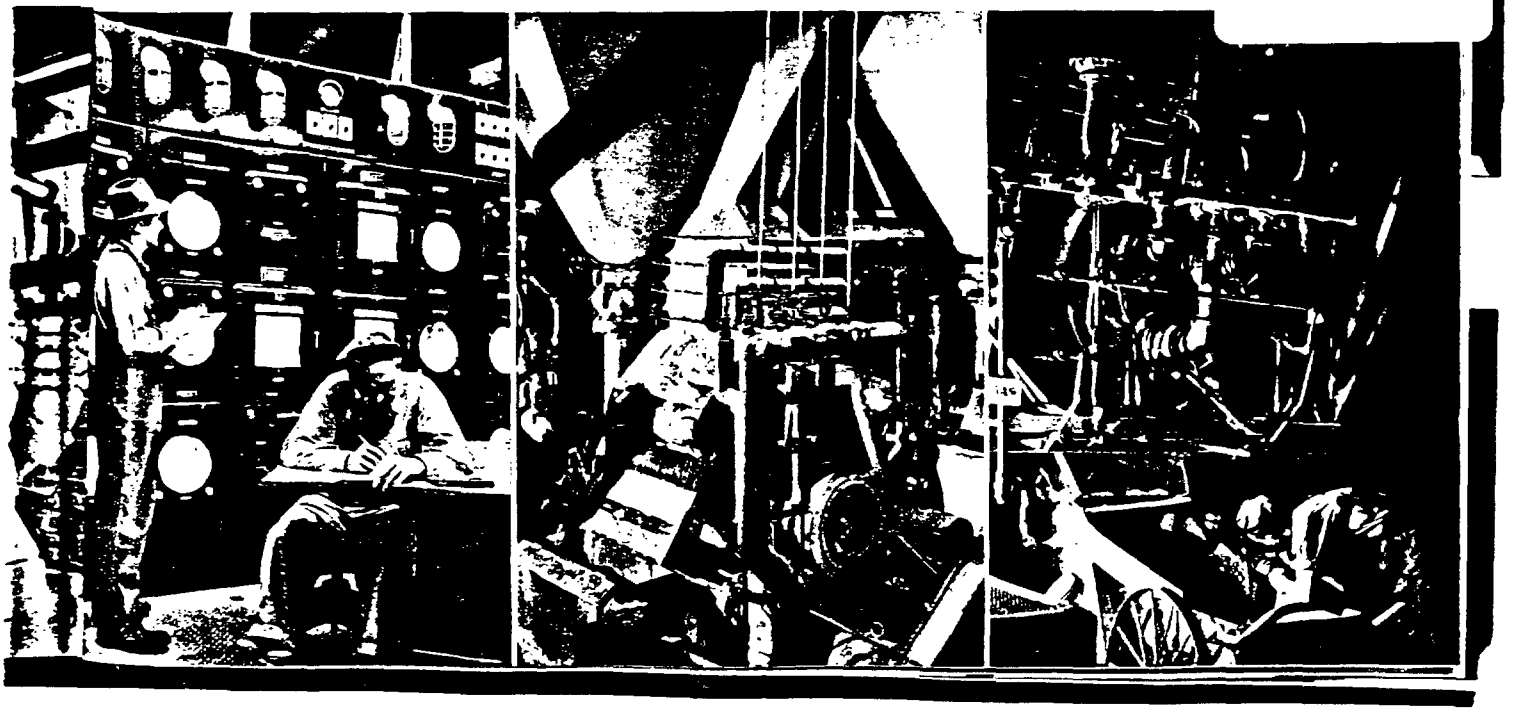
As the world's largest sodium manufacturer, and as one of the principal producers and consumers of chlorine, Ethyl's manufacturing processes require nearly three times as much electricity a day as the rest of Baton Rouge combined. A new electrical substation has been built at a cost of more than $1 million. Changes and additions to mercury arc rectifiers, transformers, and other electrical equipment have been completed in other parts of the area.

Salt used in the manufacture of sodium and chlorine enters the plant in the form of salt brine. Salt handling facilities have been enlarged by increasing brine storage capacity by 425,000 gallons; the installation of new filters, evaporators and dryers; and by new conveyor systems feeding the sodium cells with hundreds of tons of highly purified and extremely dry salt per day.

In the chlorine area, there are four new drying towers and an enlarged scrubbing and purification system, as well as additional chlorine storage tanks. Sodium handling and processing improvements include two new filters of 60,000 pounds daily capacity, and two scale tanks of 70,000 pounds each. The sodium storage area, of more than 5 million pounds capacity, has been relocated. Extensive shops with complete facilities for serving the sodium and chlorine operations will simplify and expedite maintenance problems.

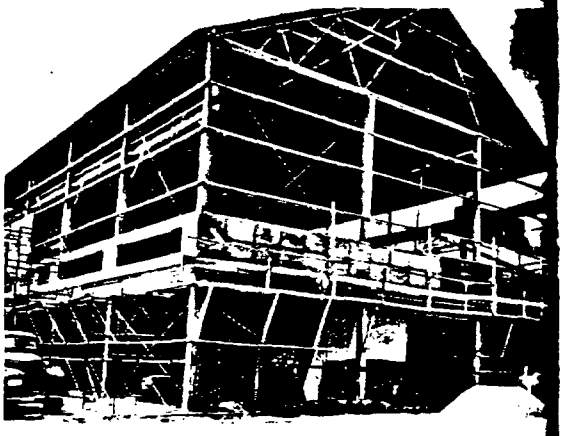
Ethyl personnel participated in the actual construction of many of the new facilities during the expansion program. In this picture, five Ethyl men check the progress of construction in the sodium area. They are: Joseph A. Brown, supervisor (center), and, left to right, Foremen Amos L. Black, Elmer Jones, Byron G. Gouner, and William F. Hansen

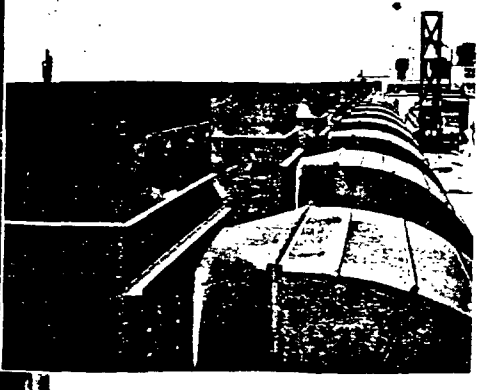
ETC 24216



A new substation, below, was erected at the Ethyl plant to handle the greatly increased electrical requirements in sodium operations . . . Left, four Ethyl men — Rosemond P. Triche and Maxwell A. Lea (crouching) and Edward H. Coxe and John D. Daigre (standing) check the installation of a mercury arc rectifier . . . At the right, below, an electrician is at work installing a new control switchboard

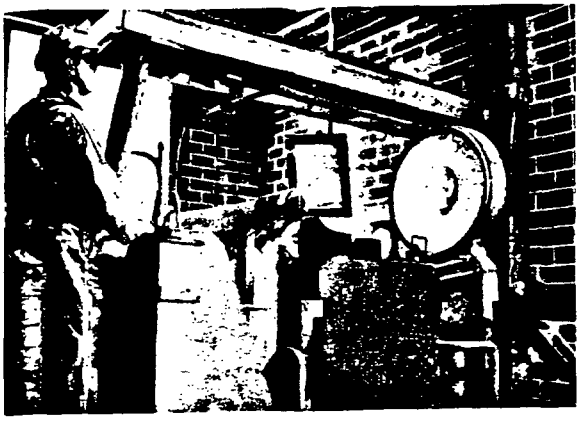
Below, Feltus H. Wade, assistant construction supervisor for Ethyl (right), discusses a construction step on a new sodium filter with a contractor's representative



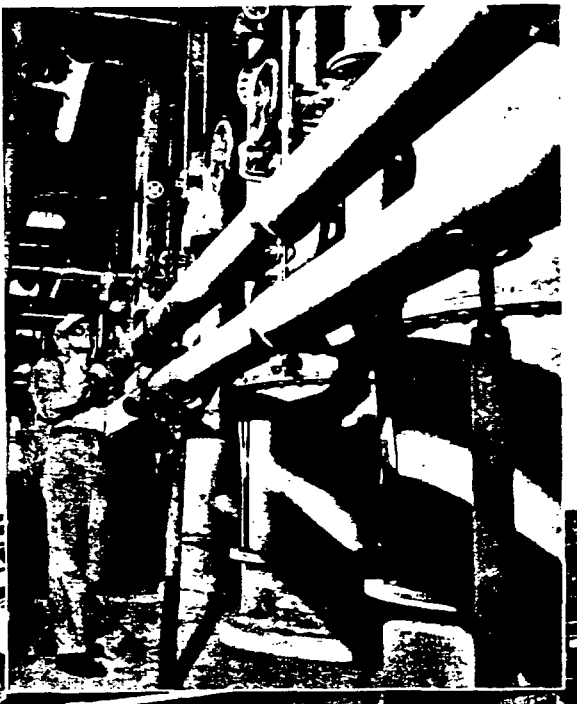


Above, the new maintenance and service shops for the sodium area . . . Left, a row of exhaust ducts on top a sodium wing

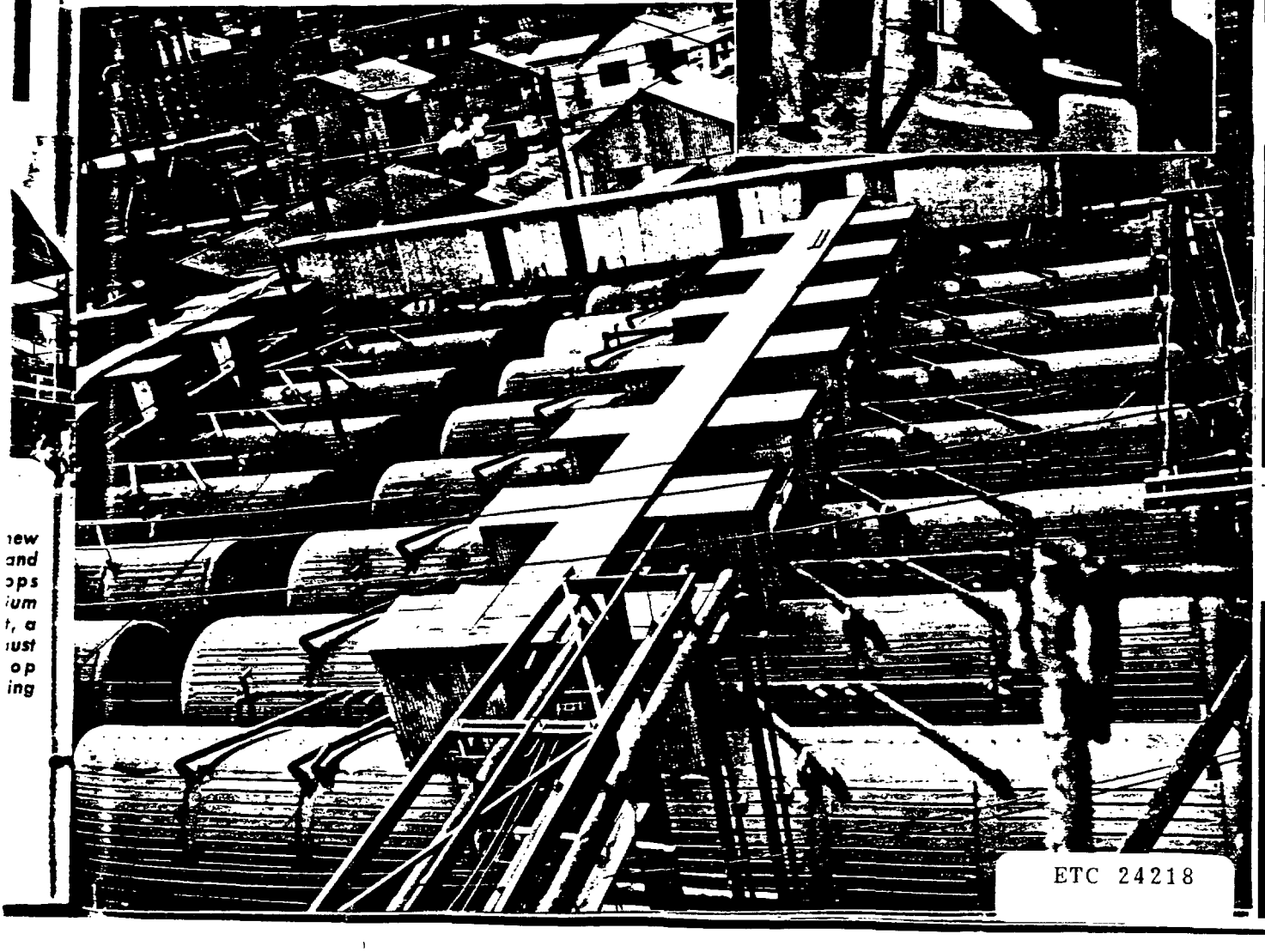
ETC 24217



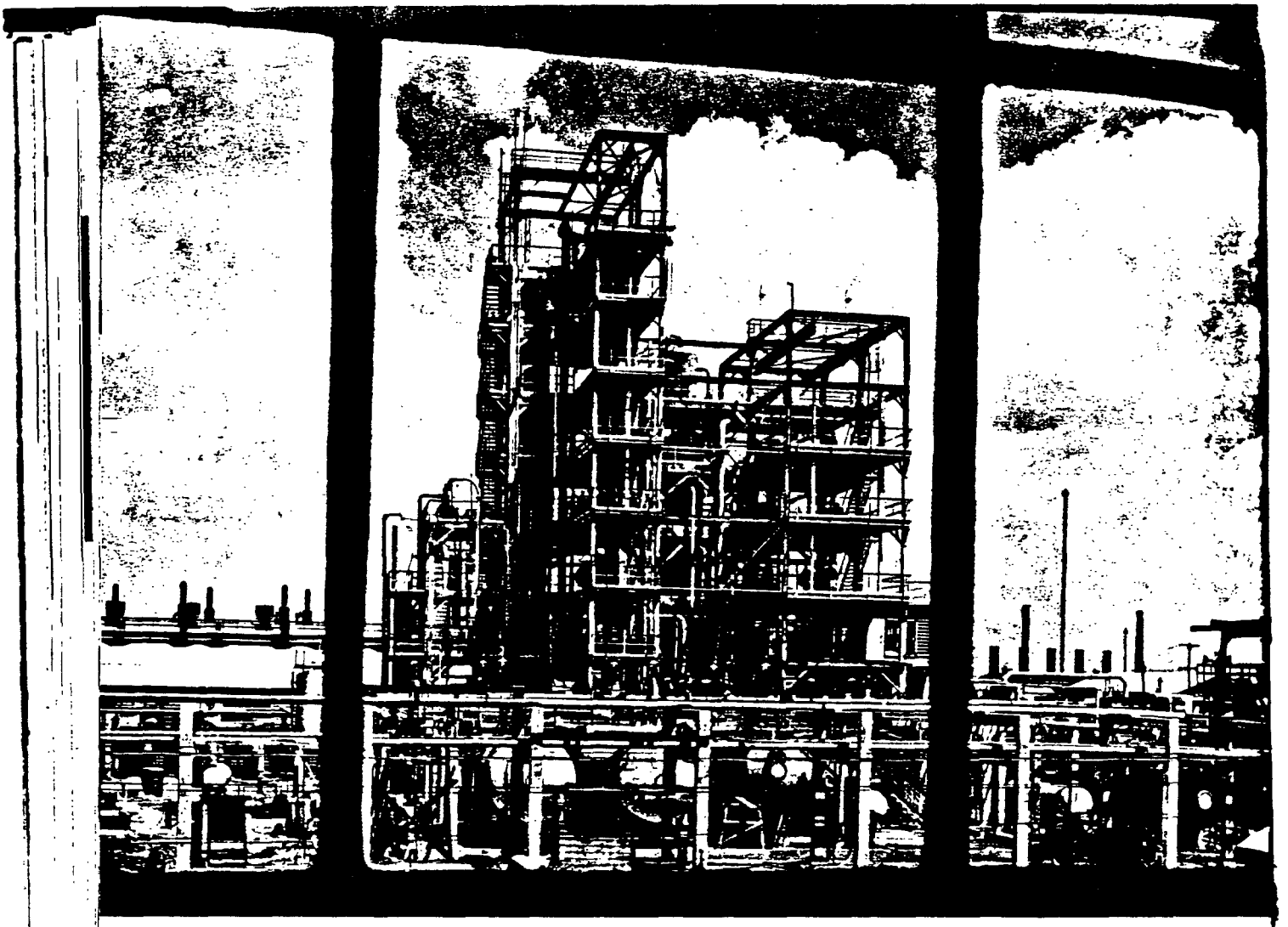
Newly-produced sodium is taken by a receiver and weighed on scales before being filtered and purified . . . Below, a section of the new chlorine drying towers in the area



Finished sodium not immediately required for the manufacture of "Ethyl" antiknock compounds is stored in the area pictured below. The tanks used for this purpose are especially designed. Ethyl's sodium manufacturing facilities have been so increased that it will be able to make metallic sodium available to other industries



ETC 24218



New and more efficient facilities in ethyl chloride contribute to increased production

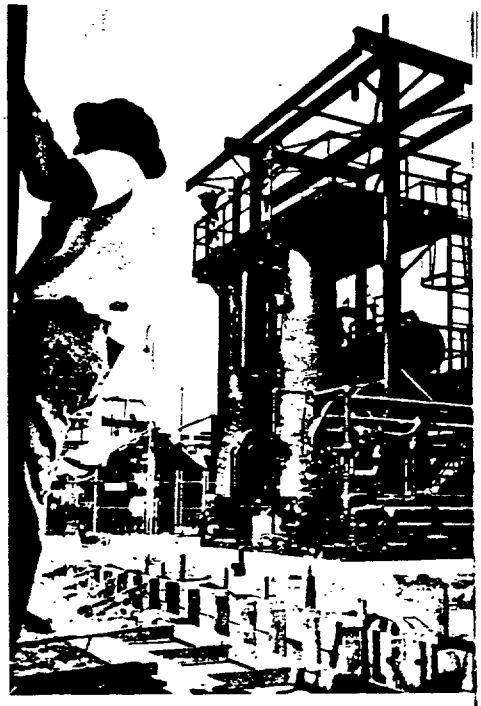
The most significant feature of the new facilities and improvements in the ethyl chloride area is their contribution toward increased production through efficiency of operation. Ethyl is now able to produce substantially more ethyl chloride than it could manufacture prior to the construction of the fourth plant, both on the basis of new construction and changes and improvements in existing facilities.

A continuation of Ethyl's position as the world's largest producer of ethyl chloride seems assured, largely through the completion of the new $3 million manufacturing unit.

Another principal addition to the area is the new ethylene dichloride plant, whose product is among the chemical additives blended with tetraethyl lead in the final stages of production of "Ethyl" antiknock compounds.

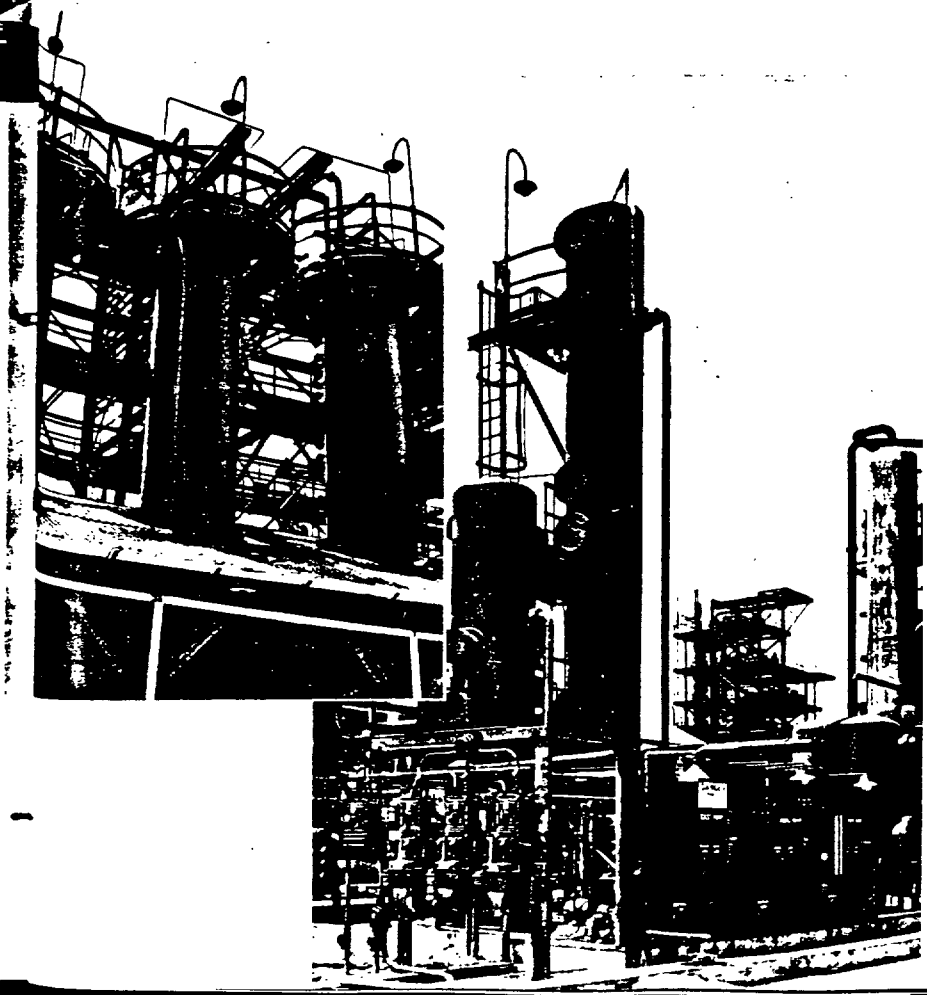
A number of auxiliary installations have been built or added throughout the area. The plant has constructed, for example, three more hydrogen chloride burners, new ethylene and HCl driers, a large water cooling tower, and two additional hortonspheres of 10,000-barrel capacity for ethyl chloride storage. New hydrogen chloride, propane and chlorine compressors have been installed, as well as facilities for unloading raw materials, and tanks for storing ethylene dichloride and sulfuric acid. The expansion of water, power, steam and other utility lines has been extensive.

Personnel who aided in the ethyl chloride expansion work included Floyd L. Smith, Harry L. Butler, Clinton A. Causey, and Jasper Jines

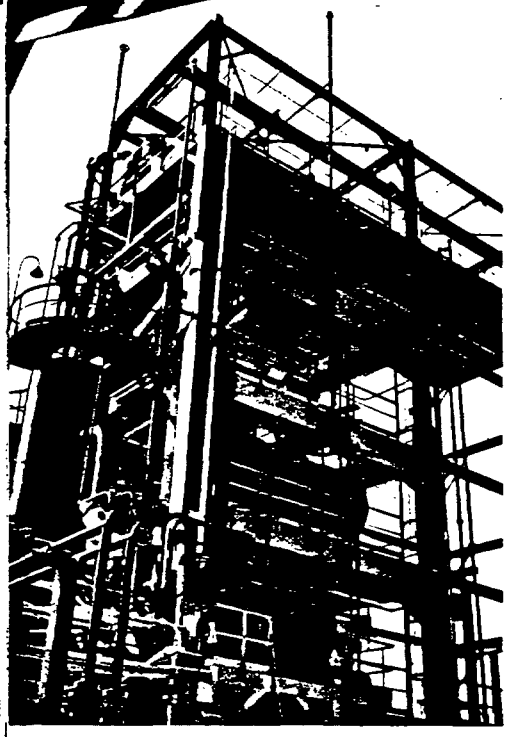


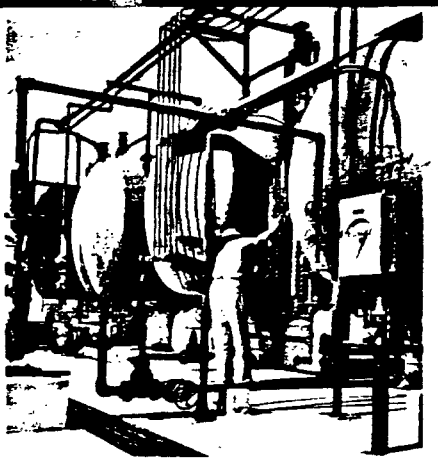
Top, this new ethylene dryer will aid in ethyl chloride operations . . . Above, John S. Bridges, Jr., Eric P. Breidenbach, and Paul N. Major, all of whom handled phases of design and construction in the ethyl chloride area

These are three additions to hydrogen chloride capacity



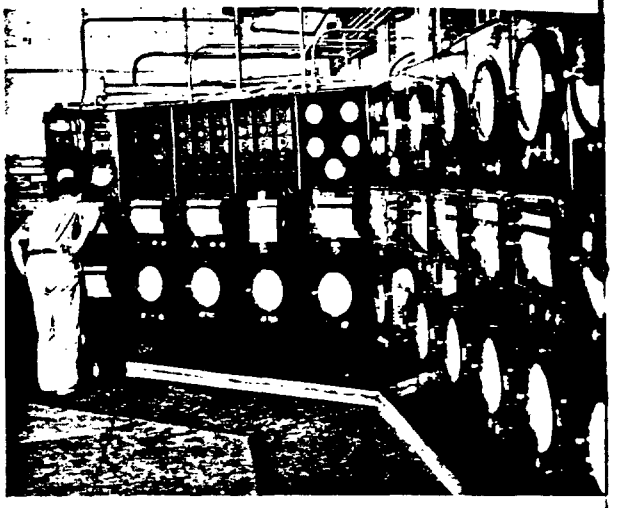
Left, a new hydrogen chloride dryer for ethyl chloride operations



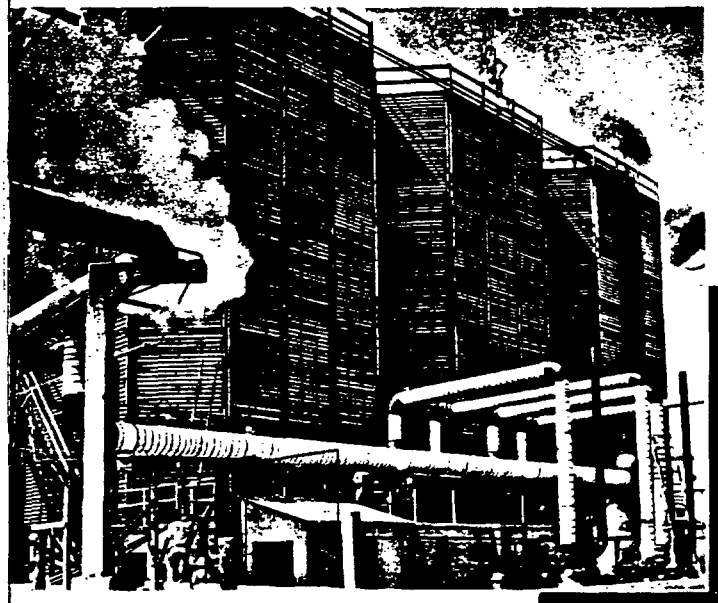


Ethylene dichloride storage facilities have been enlarged as part of the over-all plant expansion

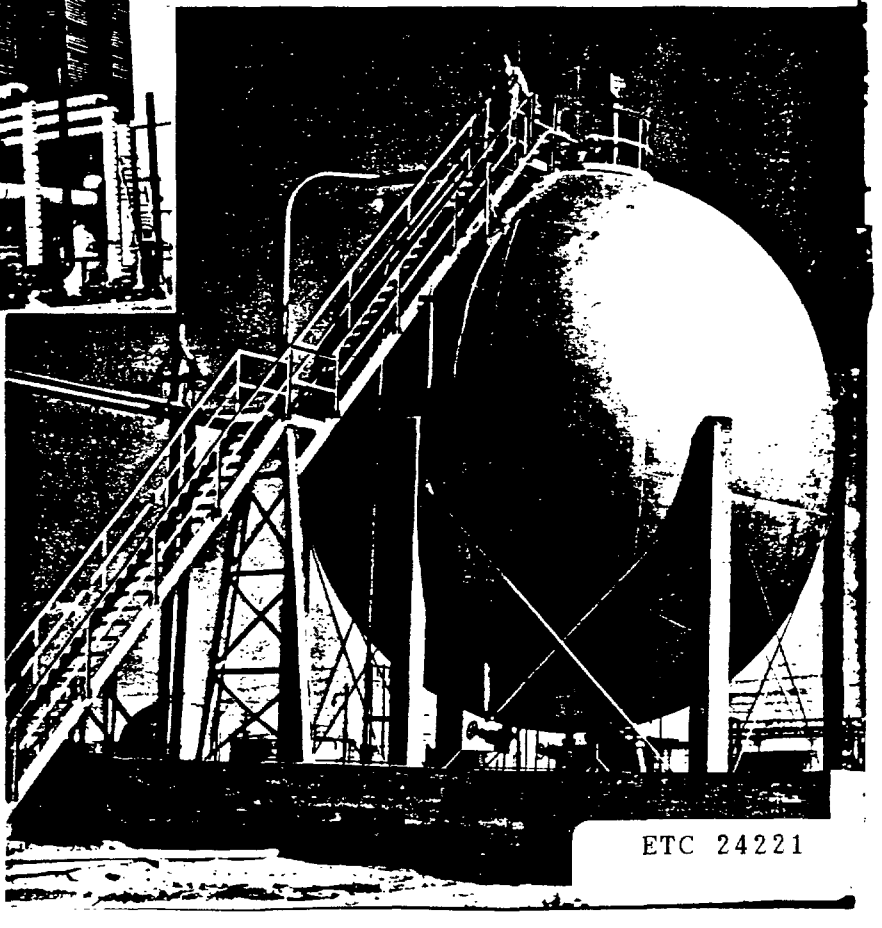
Left, a view of the new ethylene dichloride plant, which will meet all the plant's needs for this ingredient of "Ethyl" fluid



A typical control panel in the ethyl chloride area records pertinent data

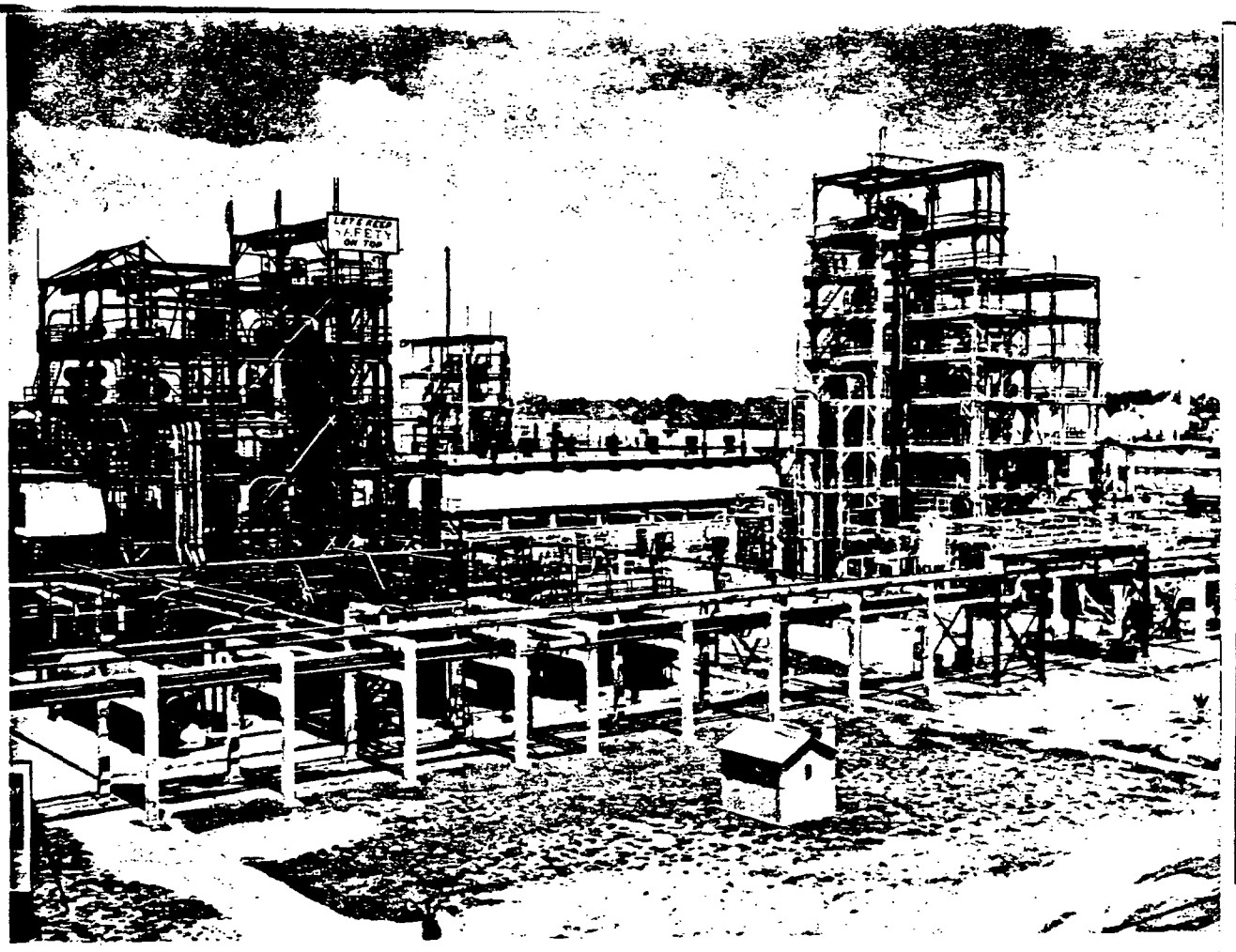


Among the necessary auxiliary installations which form part of the plant expansion is this 3-unit cooling tower

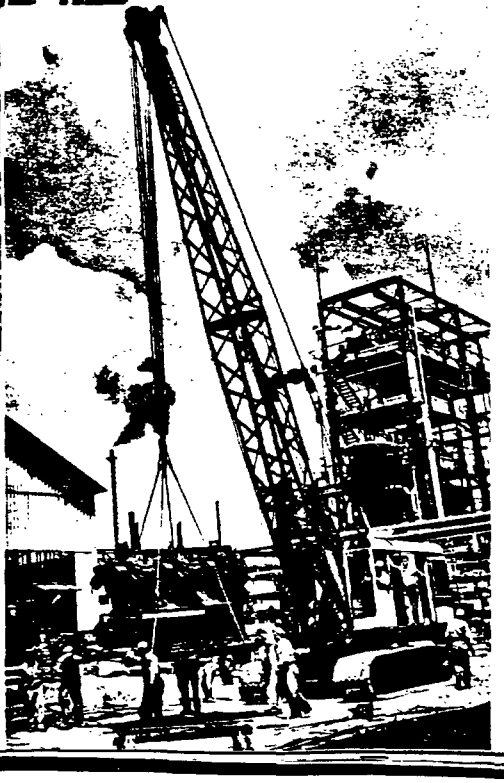


The plant's ethyl chloride storage capacity has been increased by the addition of several new hortonspheres

ETC 24221



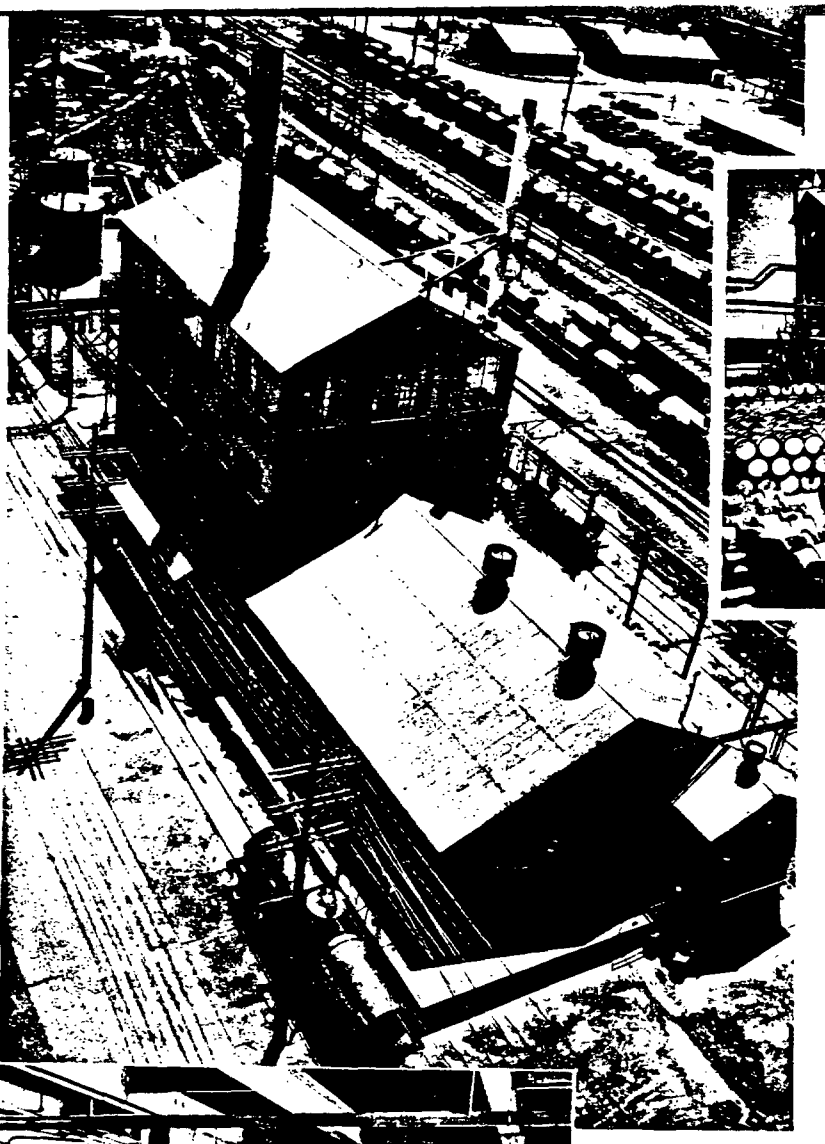
Above, the third and fourth ethyl chloride units. The new unit, at the right, together with important improvements in the No. 3 unit and other installations in the area, will result in a substantial increase in ethyl chloride capacity



Above, the compressor facilities have been enlarged as part of the ethyl chloride expansion . . . Right, easing a 24-ton compressor into its new berth

In the ethyl chloride area, as in all areas, the process streams are constantly checked

ETC 24222

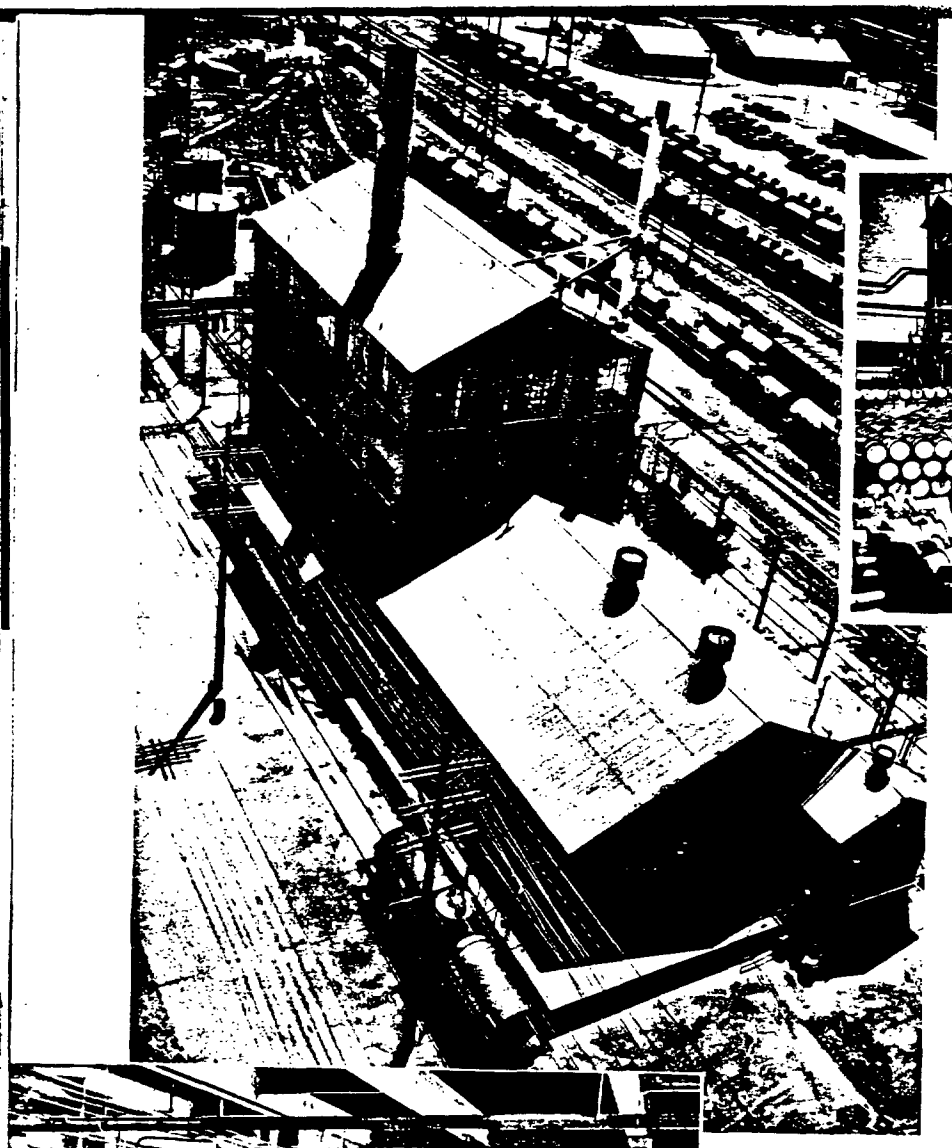


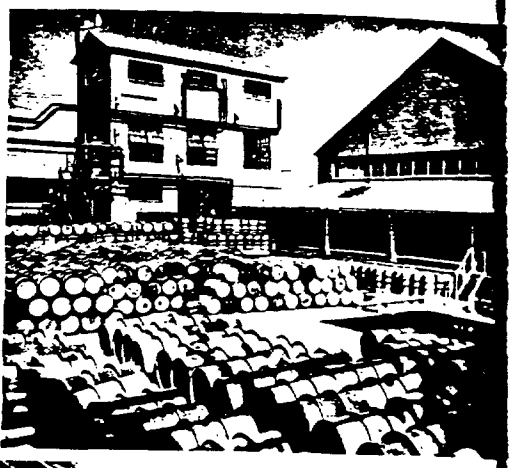
Delivery servic peak producti

Completion of our manufacturing expansion program brings to fruition a two-year ambition. We now have productive capacity and distribution facilities which will enable us to serve the oil industry more efficiently than ever before. Looking forward we can set our sights on new peaks of automotive performance and octane number efficiency.

In addition to increased manufacturing capacity, Ethyl Corporation has completed a number of other steps which give us greater flexibility of operations. Among these are the two new storage and distribution terminals which have been constructed at Edge Moor, Delaware, and at Wilmington, California. These new

In the blender building, all ingredients of "Ethyl" antiknock fluid are precisely weighed, and proportions are carefully checked, before the product is shipped





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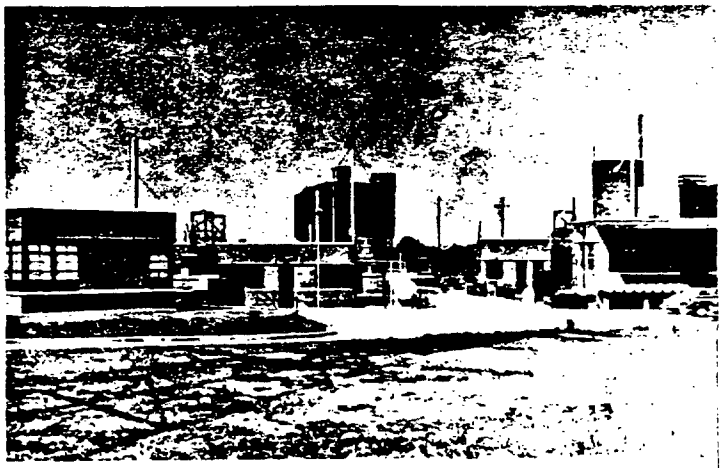
ETC 24224

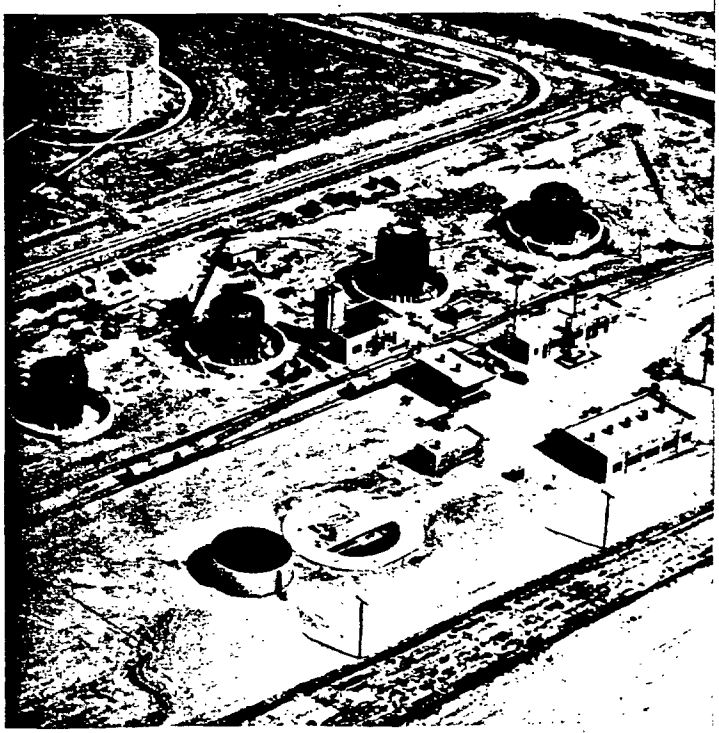
From the blender building, shown at the far left on the opposite page, a trainload of "Ethyl" antiknock compounds can be filled in a day. . . Left center, the new drumming plant. . . Left, a test car daily checks the accuracy of the track scales used to weigh tank car shipments



ices now ready to handle ion

by Harry W. Kaley,
Vice President in charge of Sales and Advertising

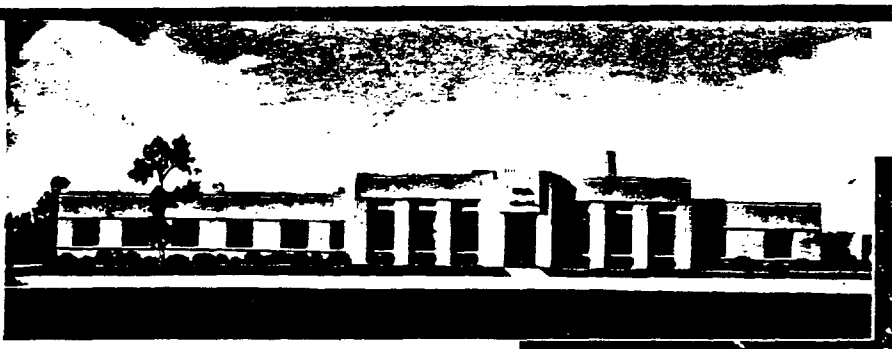
Ethyl's field terminals in Delaware (above) and California (below) serve refiners in their areas



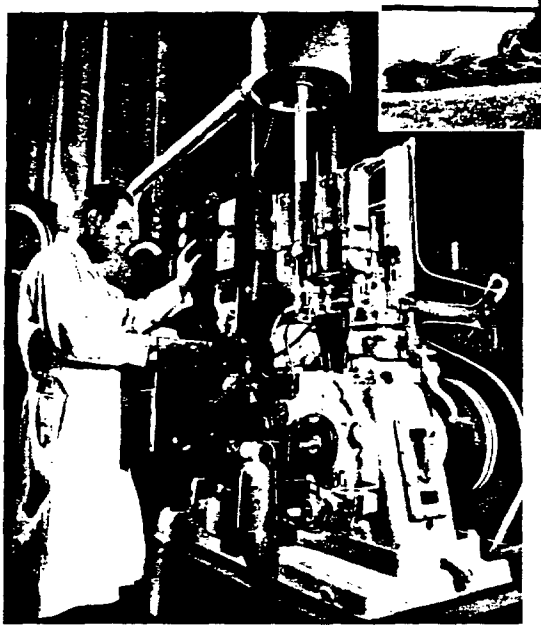
terminals are in effect second sources of supply of "Ethyl" antiknock compounds, supplementing the deliveries made directly from Baton Rouge. A new drumming plant has improved our ability to expedite drum shipments of "Ethyl" fluid. Our fleet of railroad tank cars has been increased sufficiently to handle the enlarged production of the plant.

With the somewhat remote, though ever-present, possibility of sudden fluctuation in demand for antiknock compounds, an adequate margin of manufacturing capacity is in one sense another advantage which Ethyl offers its customer oil companies. It is a service of preparedness, which we rank in value with our expanding field service programs. Through the years we have developed such services as our comprehensive research activities, our gasoline testing service, our safety program, and our technical services with manufacturers of automobiles, trucks, buses and tractors. For the future, we intend to intensify our programs of service and education.

ETC 24225



Helping to promote the most effective utilization of "Ethyl" antiknock compounds in gasoline is one of the major goals of Ethyl's research laboratories in San Bernardino, California (above) and in Detroit (right). The Detroit laboratories are the principal research headquarters, while the San Bernardino labs are devoted to road research programs the year round

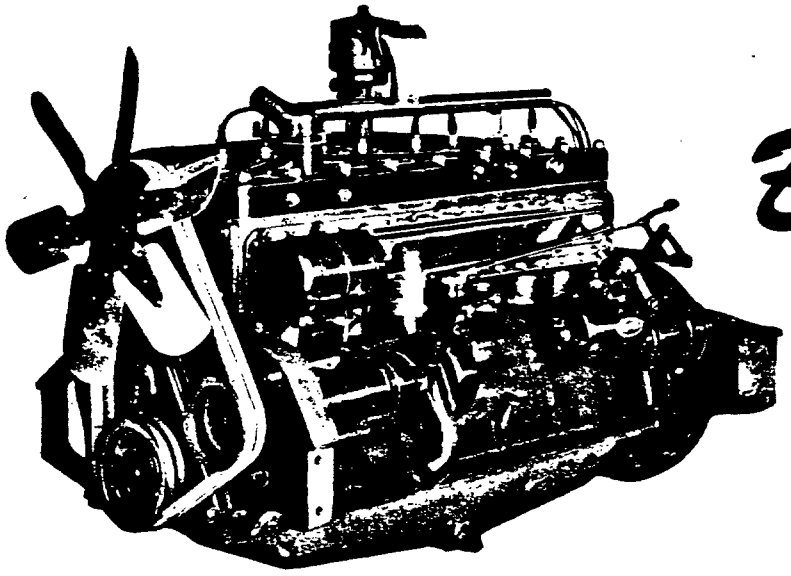


Left, gasoline testing is one of the continuing services Ethyl makes available to the oil industry. Ethyl maintains five gasoline testing laboratories throughout the United States

Below left, helping farmers to realize the maximum benefits of power farming is another Ethyl service activity. To this end, Ethyl tractor engineers work with manufacturers and users alike

Below, Ethyl's safety department insures the safe handling of "Ethyl" fluid at every step. Field safety engineers regularly inspect "Ethyl" fluid blending plants and attend tank cleanings

ETC 24226

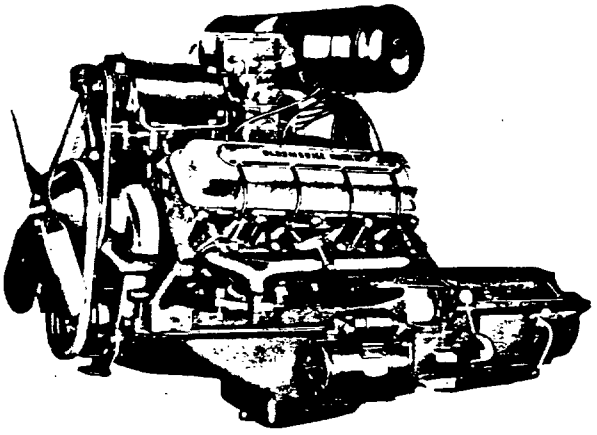


Before

1929 PIERCE-ARROW ENGINE

NUMBER OF CYLINDERS:	8
WEIGHT:	825 POUNDS
RATED HORSEPOWER:	125
COMPRESSION RATIO:	5.07:1

-and After



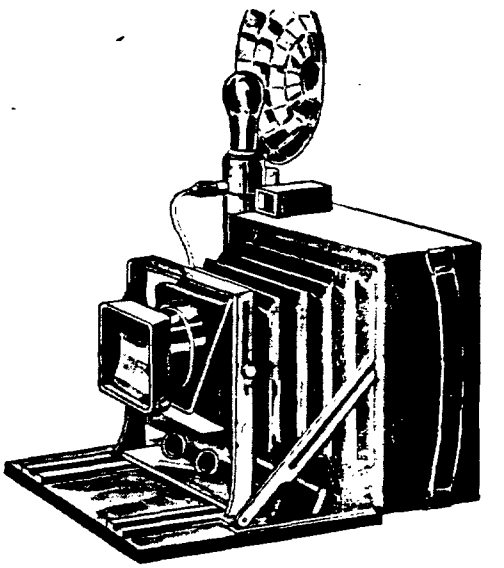
1949 OLDSMOBILE "ROCKET" ENGINE

NUMBER OF CYLINDERS:	8
WEIGHT:	675 POUNDS
RATED HORSEPOWER:	135
COMPRESSION RATIO:	7.25:1

A "before-and-after" testimonial to "Ethyl" antiknock fluid, and the better gasolines it has helped oil refiners to make and sell, is the 1949 engine, shown at the right, and the 1929 engine, at top. The new engine weighs less, is more powerful, and goes farther on a gallon of gasoline. This is one capsule of oil progress.

ETC 24227

No camera can snap a picture of



E 26

. . . but it is an important added ingredient in "Ethyl" antiknock compounds

E 26 is the knowledge that Ethyl has acquired through twenty-six years of service to the petroleum industry . . .

E 26 stands for the twenty-six years of antiknock experience of Ethyl personnel.

E 26 stands for twenty-six years of varied and comprehensive antiknock services designed to help refiners get the greatest value from each pound of antiknock compound.

E 26 stands for twenty-six years of continuing product development to improve "Ethyl" antiknock compounds.

We believe **E 26** is a most important added ingredient in "Ethyl" antiknock compounds—used by more than 225 refiners to step up the antiknock quality of their gasoline.

ETC 24228

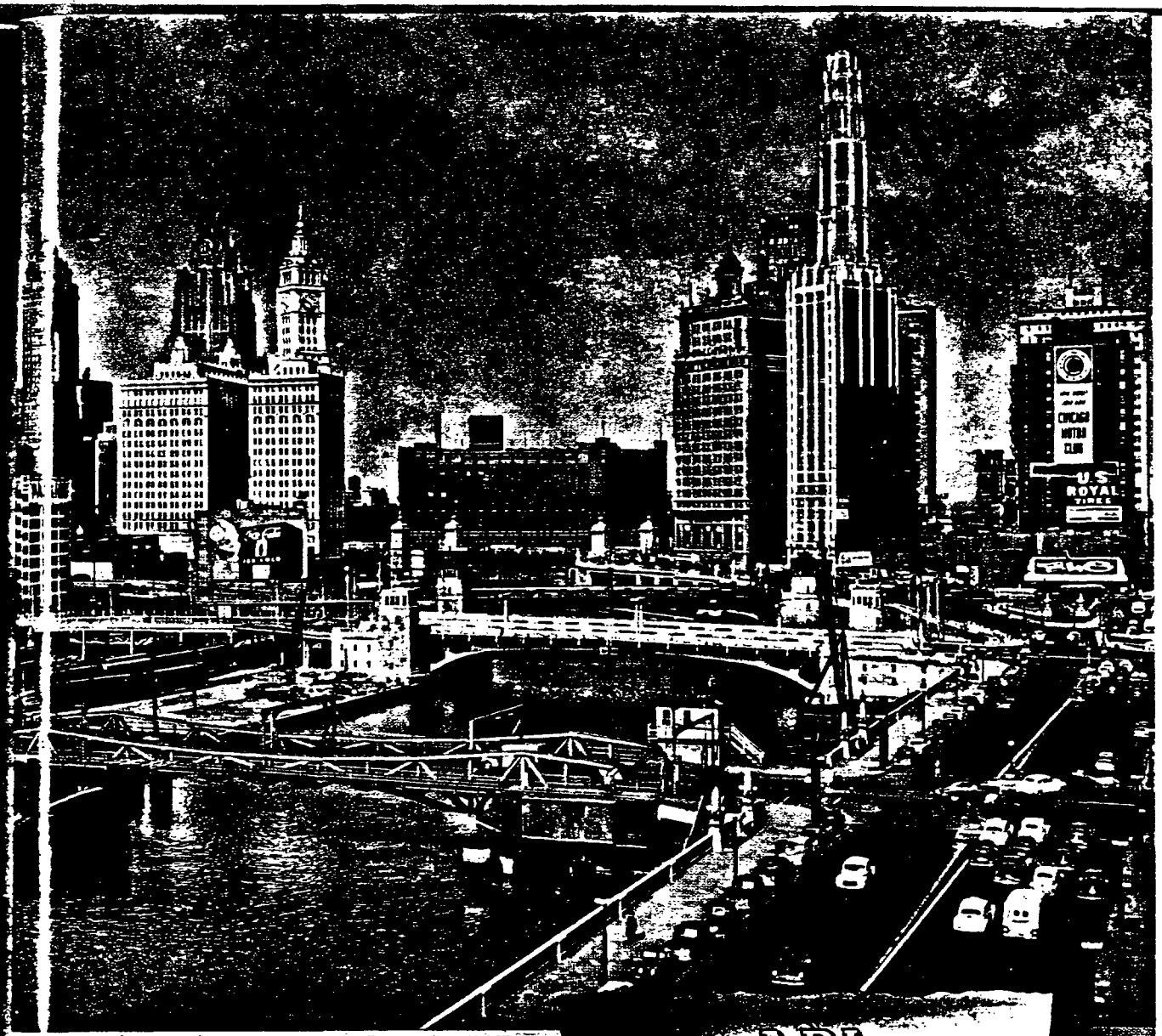
ETHYL CORPORATION

Chrysler Building, New York 17, N. Y.

Manufacturing Plant . . . Baton Rouge, Louisiana

"ETHYL" ANTIKNOCK COMPOUND — ETHYL CORPORATION

Products sold under the "ETHYL" trade-mark: Antiknock Compounds . . . Salt Cake . . . Ethylene Dichloride . . . Sodium Metallic . . . Chlorine (liquid) . . . Oil Soluble Dye . . . Benzene Hexachloride (technical)

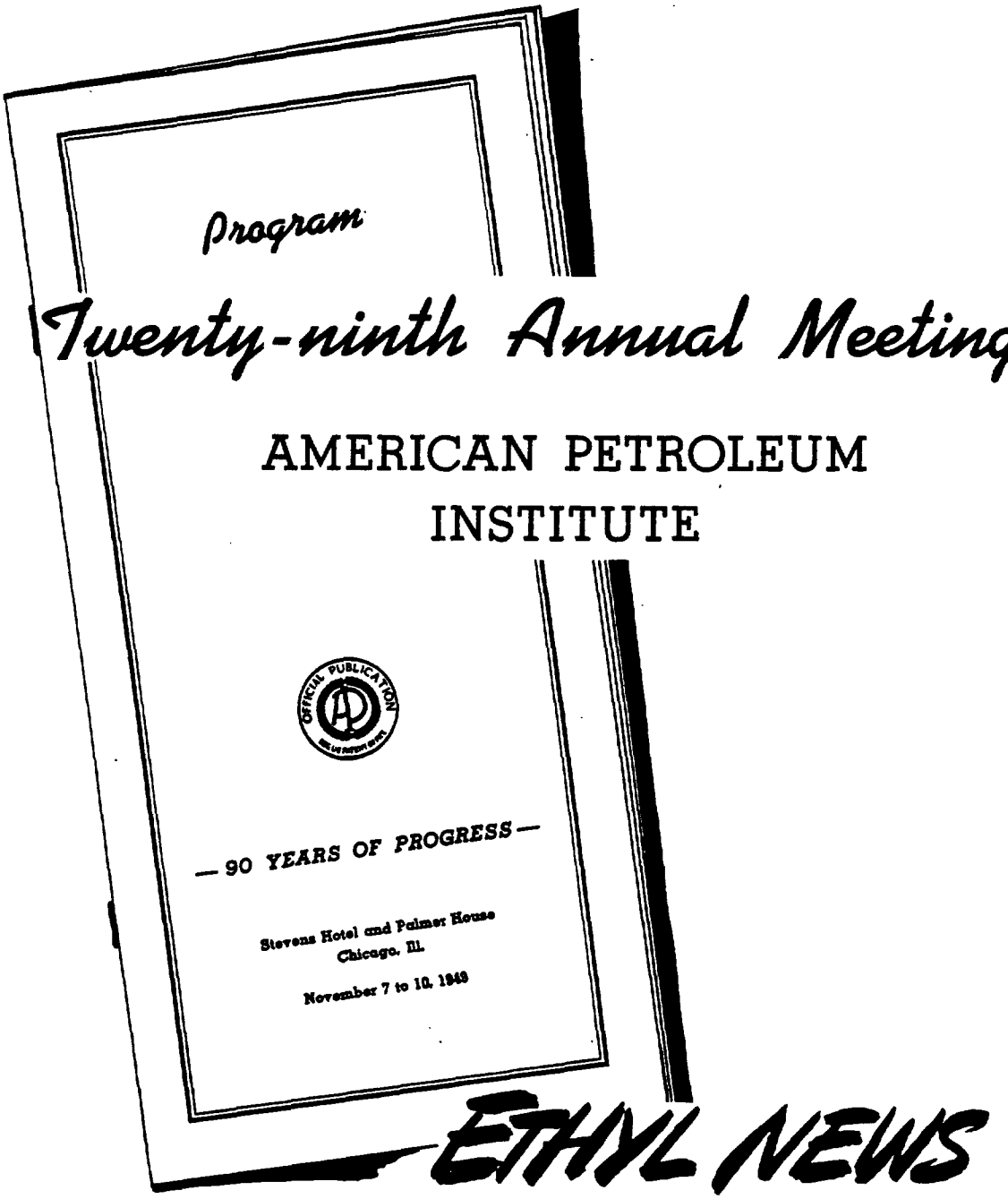


API CONVENTION ISSUE

ETHYL NEWS

DECEMBER ★ 1949

ETC 24229



ETHYL NEWS

DECEMBER 1949

Published by ETHYL CORPORATION, 405 Lexington Avenue, New York 17, N. Y.

Manufacturer of "Ethyl" antiknock compounds, used by oil companies to improve the antiknock quality of aviation and motor gasoline

Edward L. Shea, president; Stanley T. Crossland, vice president and treasurer; Richard M. Page, secretary

AS FOR THE past several years, the December issue of the *Ethyl News* is devoted to a pictorial report of the annual meeting of the American Petroleum Institute. By means of the candid camera technique, an effort has been made to obtain an informal, pictorial record of the convention from beginning to end.

The API's twenty-ninth annual meeting, which was held in Chicago from November 7 to 10, was one of the most stimulating on record. Attended by a total of 5,100 members and visitors, the meeting heard reports on various technological developments in oil, listened to important discussions of contemporary problems, and weighed the outlook on many issues as analyzed by various spokesmen.

Through these informal pictures it is hoped that some of the mood and spirit of the fruitful meeting may have been captured.

The Editors

Left, aboard the 20th Century were Michael Halpern, vice president, and W. S. S. Rodgers, chairman, The Texas Co.

Above, chatting aboard the Century are F. H. Meeder, vice president, Richfield Oil of New York; Harvey Carter, of Oil Trading; and A. E. Watts, vice president of Sinclair Oil.

Destination: Chicago

FROM ALL POINTS of the compass, a near-record total of 5,100 men and women converged on Chicago, early last month, to attend the 29th annual meeting of the American Petroleum Institute. Representing all branches of the oil industry, they came from every section of the country and also included a number of overseas visitors in their ranks.

Most of them arrived in time for the formal opening of the convention on Monday, November 7. Many, however, were on hand the previous week, to participate in the preliminary work of various committees. Committee meetings began as early as Saturday, November 5 and continued through the following Thursday, the close of the convention.

As was to be expected, the influx of the API "delegates" taxed the facilities of Chicago's hotels, but most of them were able to find accommodations without difficulty. Handy reference lists of names of those in attendance and their

Left, a delegation of oil men from New York, as they left a special section of the 20th Century Limited . . . Below, left, alighting from their company plane are N. T. Stover, M. S. Hauser, C. L. Fleming, N. G. Dumbros, and A. G. McKee (rear), all of Ohio Oil.

Above, George H. Shaw, counsel, and B. S. Watson, vice president, Cities Service Co., share a dinner table.

Harry A. Hassan, vice president, Sinclair Refining, and Henry L. Schwartz, president of Paragon, at dinner on the train.

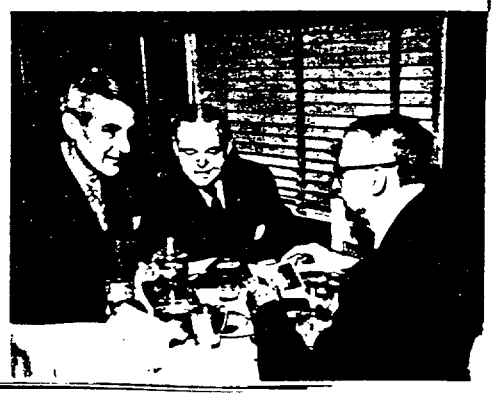
Among the several hundred oil men aboard the Twentieth Century's API special section were C. F. McGoughran, of Sinclair Refining; Rud J. Babor, vice president of Frontier Oil Refining; Marc F. Braeckel, president of Richfield Oil of New York; and Wiley Butler, president of Coastal Oil.

G. R. Bryant, of The Texas Co., and P. C. Spencer, president of Sinclair Oil, chat with Harry B. Hilts, of ESPA.

Casting their eyes over the Century's dinner menu are R. A. Hunter and R. O. Jennings, both of Gulf Oil.

rooms, published daily by several oil periodicals, enabled everyone to reach his friends and associates readily.

As in 1948, the API's annual meeting was so large that the facilities of the Palmer House, as well as of The Stevens, were used to handle the many sessions and committee meetings. The four days of the API meeting were especially busy ones, but they were also highly fruitful in knowledge gained and decisions made.



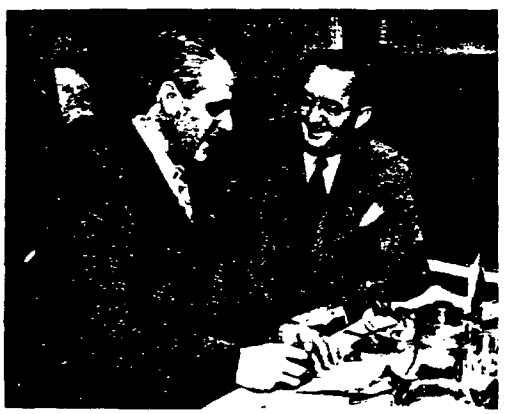
David A. Shepard, F. Warren Butler, and M. G. Gamble, all of the Jersey company, formed this dinner table threesome.

ETC 24233

Whiling away the time in a game of cards are John D. Brandli and Harold L. Valentine, president, Metropolitan Petroleum.

Below, W. C. Burns, president of Hartol Petroleum, and George M. Fuller, of Addison Outwater.

T. T. Thompson (below, right), of Shell, is an interested listener as D. S. Flynn, of Ethyl, makes a point.



Below, Eugene R. Sullivan, counsel to Cities Service, dining with Maynard I. Landa, of Petroleum Advisers.

John M. McMillin, vice president, Cities Service, and H. E. Brandli, vice president, Cities Service Oil (Pa.), at a dinner table aboard the Century.

ETC 24234

Below, R. L. Goltz, of Ethyl, chatting with W. R. Argyle, vice president of Sinclair Refining, en route to Chicago.

Below, among the visitors from overseas was Rene J. Perrin, president of Compagnie Francaise de Raffinage, shown with J. F. Thornton, vice president of Lummus.

J. A. Bartlett (foreground), vice president of American Mineral Spirits, draws a card in a game with James R. Sloane, of Oil Trading; E. M. Toby, Jr., president of American Mineral; and Howard Westfall, of General American Transportation.

En route with their wives to the API convention, James F. Breuil, president of Frontier Oil Refining, and E. W. Endter, president of California Oil, talk over a professional football game which Mr. Breuil's team, the Buffalo Bills, won that day.

Chatting together in the club car of the 20th Century Limited are Robert H. Miller, vice president of Creole Petroleum; Joseph H. McCabe, of E. W. Saybolt; and J. Milton Rice, of Esso Export.

Harry H. Fuller, of Sinclair Refining, stops to say hello to Jesse Stickel, vice president of Crown Central Petroleum, and Jack L. Minner, of Shell, in the dining car of the 20th Century Limited.

ETC 24235

Arriving in Chicago ahead of the convention's formal opening, many oil men took time out to see a professional football game on Sunday. At the left are Floyd L. Miller, of Standard Oil Development; G. A. Olsen, president of Sunland Refining; and Clay Thompson and Malcolm McDuffie, both of Mohawk Petroleum . . . Center, left, other spectators at the game included Howard Cuyler, Standard Oil of California; San Wagner, of Ethyl; David E. Day vice president, Richfield Oil; and S. B. Sargent, president, Sargent Engineering.

Getting ready for the API meetings, three workmen put a banner into place.

The API registration room presented this crowded scene on Monday morning, as the annual meeting got under way . . . Left, arriving at the convention, H. LeGros, of the LeGros Oil Co., and his wife check in at the hotel.

ETC 24236

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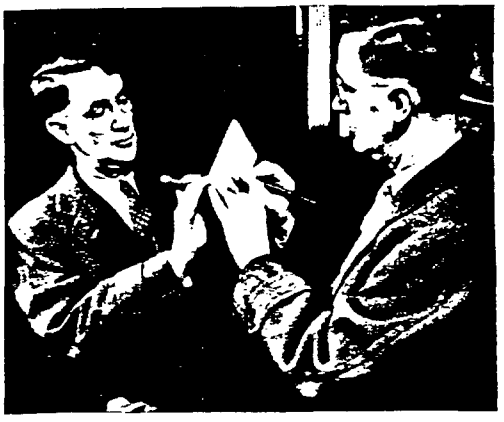

Robert L. Parsons, of Parkersburg Rig & Reel, fills out a registration card against a mirror.

Above, adding their names to the convention roster are J. M. Hanley, of Northern Natural Gas, and R. J. Whitley, of Socony-Vacuum.

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API director B. A. Hardey stops at a Stevens window to learn what room has been assigned to him.

Roland E. Smith, of Champion & Smith, lends a willing shoulder as Jack Ballagh, chairman of Key Contractors, signs in.

C. W. Dyniewicz, of Deep Rock, discusses room reservations with W. G. Bowman, of The Stevens.

Robert E. Gaynor, of Johnson Oil Supply, fills in the necessary API registration data.

Two Detroiters — Errol Gay, a private consultant, and John Campbell, of General Motors Research — check over the program of meetings, after registering at the convention.

ETC 24237

The capacity audience at the opening general session included many standees. Others lined the balcony overlooking the grand ballroom.

Salute to Service

PRESENTATION OF the API Gold Medal for Distinguished Achievement was made to J. Howard Pew at the Wednesday afternoon general session, first of two held during the convention. The session also heard a farewell speech by William R. Boyd, Jr., retiring president of the API, and a feature address by Dr. Robert E. Wilson, board chairman of Standard of Indiana.

Mr. Pew, a director and former president of Sun Oil Company, is the fourth recipient of the API Gold Medal, which was instituted at the 1946 annual meeting. Those previously honored were William M. Burton, the late Henry Ford, and Charles F. Kettering.

Mr. Pew's acceptance speech was a call to men of the industry to "guard well" the heritage of competition "for the benefit of the American people," which past leaders of our industry bequeathed us. "If it is true," Mr. Pew said, "that market demand has influenced some decisions" on maximum allowables, "I am opposed to it."

On the rostrum to deliver the annual President's Address, Mr. Boyd also accepted a testimonial scroll signed by members of the Institute's board of directors. Presentation of both the API Gold Medal to Mr. Pew and the scroll to Mr. Boyd was made by W. Alton Jones, newly named chairman of the API board.

Mr. Boyd's address marked his final official appearance as active head of the API.

Following the talk, Mr. Boyd's interim successor, Baird H. Markham, was introduced. He is serving in an acting capacity until the new API president is selected.

Names of those who will serve as API directors during the coming year were read by Lacey Walker, Institute secretary.

Delivery of his annual message was the last official act of retiring President Boyd after an eight-year tenure.

ETC 24238

In this picture, which in some ways seems to reflect his staunch character, J. Howard Pew is shown delivering his API Gold Medal acceptance speech. In the address, Mr. Pew declared that advocates of high taxes and higher wages are supporting their claims with totally unrealistic estimates of post-war corporate profits . . . The Distinguished Achievement scroll and medal, which W. Alton Jones presented to Mr. Pew (below), cited the former Sun Oil president as "a conscientious servant, a wise counselor, and a courageous leader of the American petroleum industry" for almost 50 years.

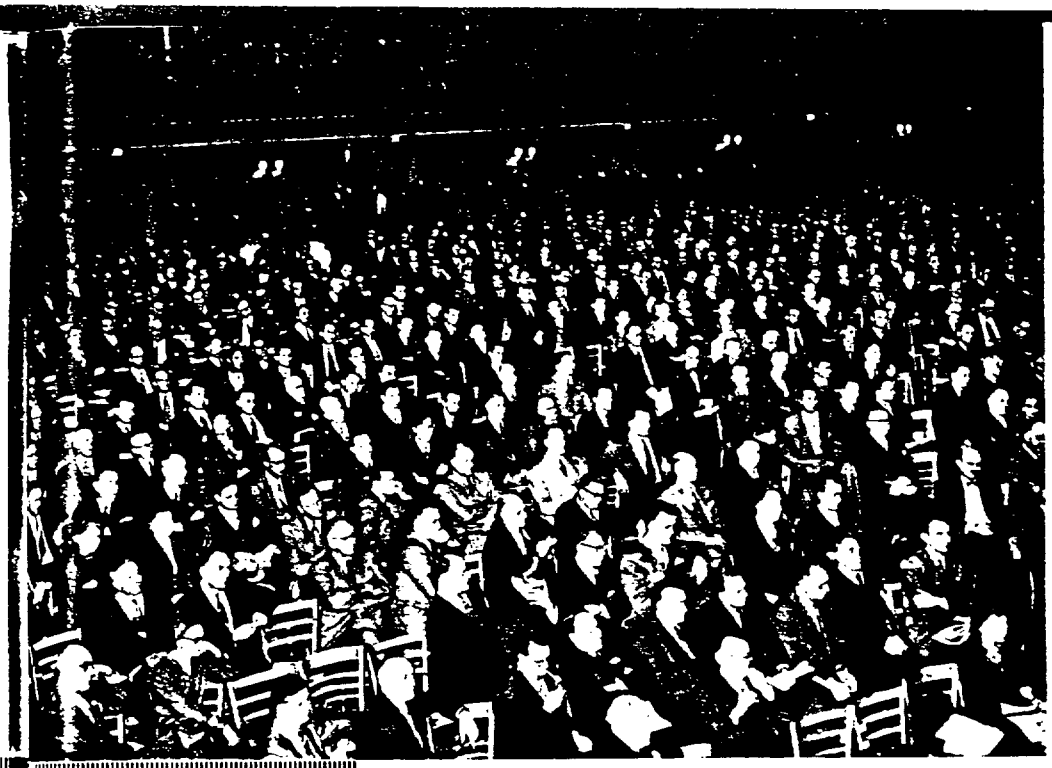
Dr. Wilson, in a speech entitled "API Wildcatting in Some Interesting Areas," outlined the social, economic, and industrial benefits that have accrued from the oil industry's cooperative program in its basic petroleum research. He estimated that three projects each had saved the industry more than the entire cost of the fundamental research program, which now runs more than $400,000 yearly.

Dr. Robert E. Wilson related the benefits of the oil industry's cooperative program in basic petroleum research.

One of the many tributes paid to William R. Boyd, Jr., on the occasion of his retirement as the president of the American Petroleum Institute, was a beautiful scroll, bound in leather, and personally signed by the members of the Institute's board of directors. Here, Mr. Boyd and W. Alton Jones pose with the scroll, following its presentation before the full assemblage of API members at the Wednesday afternoon general session.

The API meeting marked the beginning of new roles for these well-known industry figures. General Baird H. Markham, who has been director of the American Petroleum Industries Committee, accepted the post of acting president of the API. W. Alton Jones became the Institute's chairman. And William R. Boyd, Jr., after 29 years of service to the API, prepared to take a well-earned vacation . . . Below, Mr. Boyd is shown accepting a silver service presented to him by the API board, at a farewell dinner held in his honor.

ETC 24240



Facing the Future

THREE IMPORTANT SPEAKERS, each with a vital message for the oil industry, addressed the closing general session of the API annual meeting.

Speaking on the subject, "America Unlimited," Senator Robert S. Kerr, of Oklahoma, declared that "the golden age of America is in the future."

Outlining the heightened role of the oil industry in the future growth of America, Senator Kerr declared, "I know you will be diligent in the development and expansion of your great industry. I urge upon you equal diligence in the matter of public relations with your fellow Americans and with your government. Give both of them the benefit of full knowledge of your amazing contribution to victory in war and prosperity in peace."

Admiral Louis E. Denfeld, former Chief of Naval Operations, was the second speaker of the evening. Addressing the men of the oil industry as "the ununiformed members of our national defense team," he paid warm tribute to the industry's tremendous wartime accomplishment. "The abundance with which you men of oil supplied this great essential," he said, "was a major factor in turning the tide in our favor."

Discussing the international situation, Admiral Denfeld said, "The Navy has always been a firm believer in the fact that the surest guarantee of ample petroleum products in peace or war is a healthy, vigorous and progressive petroleum industry." In conclusion he said that "if the Navy is not your best single customer, it is your most appreciative."

Speaking on "Integration in American Industry," Edmund P. Learned, professor of business administration, Harvard Graduate School of Business Administration, said that vertical integration "contributes directly to the economic objectives of greater efficiency and lower prices."

Professor Learned called for a better public understanding of the economics of integration.

Senator Robert S. Kerr addressing the Wednesday evening general session.

Admiral Denfeld spoke on oil's importance to the Navy at all times.

Professor Learned delivered an address on integration in American industry.

ETC 24241

G. W. Hofmayer, Indiana Independent Petroleum Assn. secretary; Al Basye, of Ethyl; and T. R. Turner, president of Turner Oil.

With the American flag as a backdrop, Jack Cashell, of Preston Oil, and Prof. Edward O'Rourke, of Ohio State University, chat between sessions outside the registration room.

Among those who journeyed from Canada were M. S. Beringer and Ole Berg, Jr., both of whom are vice presidents of British-American Oil.

Camera Candids

Left, the Committee on Highways, as it met Monday morning. L. S. Wescoat, president of Pure Oil and chairman of the committee, was the presiding officer.

Right, a portion of the Wednesday morning meeting of the American Petroleum Industries Committee. Chairman of the committee is Oscar John Dorwin, of The Texas Co.

ETC 24242

Above, Julian J. Frey, Ethyl's sales manager, chats with E. H. Weaver (center), of Union Oil. At the right is M. F. Weill, also of Ethyl . . . Above right are R. L. Wagner and C. A. L. Walker, vice presidents of Great Lakes Pipe Line, and Marshall McArthur, president of Paraland Oil.

Right, Stanley C. Hope, president of Esso Standard; R. M. Bartlett, Gulf Oil vice president; and L. E. Ulrope, vice president of Esso Standard.

Members of the Board of Councillors enjoy a light moment while nominating API board of director candidates. Inset, J. H. Russell, Gulf Oil vice president, presiding at the Councillors meeting as D. V. Stroop, of the API staff, recorded the proceedings.

ETC 24243

With retiring President Boyd presiding (right), the API board of directors first met on Tuesday morning. Two other board sessions were held during the convention.

Board Meeting

At its several work sessions, the API board of directors, besides making a number of important policy decisions, also created the office of Chairman of the Board and elected a temporary successor to outgoing President Boyd.

Named to the board chairmanship was W. Alton Jones, president of Cities Service Company. For the past two years, Mr. Jones has served the API as vice president for Transportation.

In choosing Baird H. Markham to serve as acting API president, the board named a man who has been associated with the oil industry for 22 years, the last 17 of them as director of the American Petroleum Industries Committee. Mr. Boyd was named a director of the API, and will be available for advice and consultation.

Other API officers named by the board were Vice Presidents R. L. Wheelock, for Production; Chester F. Smith, for Refining; J. Howard Marshall, for Marketing; and T. E. Swigart, for Transportation. B. Brewster Jennings was elected treasurer. Lacey Walker was reelected secretary and assistant treasurer.

The Institute's new officials presided for the first time at a meeting of the board's executive committee on the final day of the convention. They are W. Alton Jones, board chairman; and Baird Markham, acting API president. At the far left is Lacey Walker, who was reelected secretary of the API.

ETC 24244

H. S. M. Burns, president of Shell Oil, talks with Elliott Evans, president of the Institute of Petroleum, England's counterpart to the API.

Among the newly elected members of the API board are P. C. Spencer and T. E. Swigart, presidents of Sinclair Oil and Shell Pipe Line.

Robert H. Colley and Henderson Supplee, Jr., president and executive vice president of Atlantic Refining, just before a board meeting.

Two company presidents, Hines H. Baker, of Humble Oil, and L. S. Wescoat, of Pure Oil, compare notes. Mr. Wescoat is retiring API treasurer.

Both headquartered in Chicago, the convention city, are Henry M. Dawes, chairman of Pure Oil's executive committee, and A. W. Peake, president of Standard of Indiana.

API directors R. B. Anderson, of Waggoner Estate, and John G. Pew, vice president of Sun Oil, flank David G. Gray, of Humble.

This informal group of directors consists of T. S. Petersen, president of Standard Oil of California; R. Ogarrio, vice president of The Texas Co.; Sidney A. Swensrud, president of Gulf Oil; Edward L. Shea, president of Ethyl; and Rodney S. Durkee, president of Lane-Wells Co.

ETC 24245

Colonel T. H. Barton, board chairman of Lion Oil, and John M. Crawford, chairman of Parkersburg Rig & Reel, greet D. E. Buchanan, of Hiwan Oil.

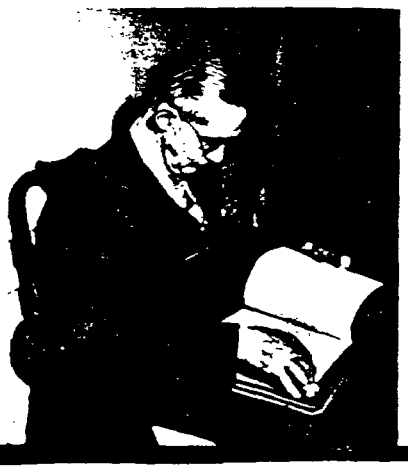
Enjoying a chat while waiting for a board meeting to begin are J. S. Bridwell, of Bridwell Oil, and Eugene Holman, president of Jersey Standard.

A general view of the luncheon meeting of the board of directors on Wednesday.

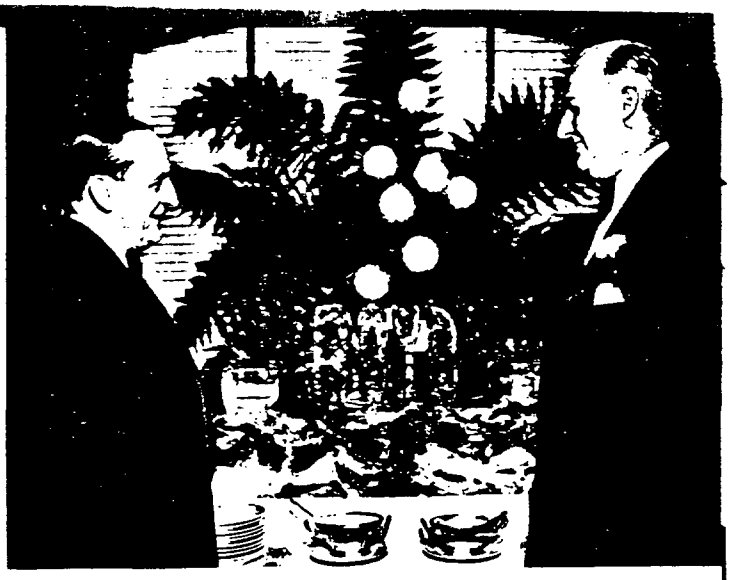
ETC 24246

L. F. McCollum and W. H. Garbade, presidents of Continental Oil and Deep Rock.

A. Jacobsen, Amerada president, looks over some reading matter.



A newspaper holds the attention of R. L. Kent, of Kent Oil.



William R. Boyd and W. Alton Jones pause at the beautifully decorated buffet table at the testimonial reception-dinner tendered Mr. Boyd by the API board of directors.

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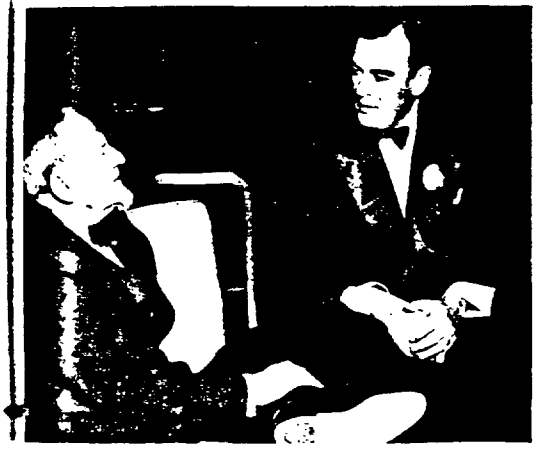
Upper left, the dinner guests included C. M. Gile, Gulf vice president, and John Harper, president of Harper Oil . . . Left, Luther Cleveland, board chairman of Guaranty Trust Co., and B. Brewster Jennings, president of Socony-Vacuum.



Far left, Merle Thorpe, of Cities Service, and Charles Jones, president of Richfield Oil . . . Left, R. G. Follis, Standard of California board vice chairman; Bruce K. Brown, president of Pan-Am Southern; and A. P. Frame, vice president of Petroleum Advisers.

ETC 24247

Below, other dinner guests included Hines Baker, president of Humble Oil; M. H. Robineau, president of Frontier Refining; C. R. Williams, vice president of Chicago Corp.; and W. K. Warren, president of Warren Petroleum.

A hearty pre-dinner laugh is enjoyed by Amon Carter, Fort Worth publisher; Ralph B. Lloyd, president of Lloyd Corp.; Reese H. Taylor, president of Union Oil; T. E. Swigart, president of Shell Pipe Line; and O. D. Donnell, former president of Ohio Oil. Most of the API directors and many invited guests attended the testimonial dinner.

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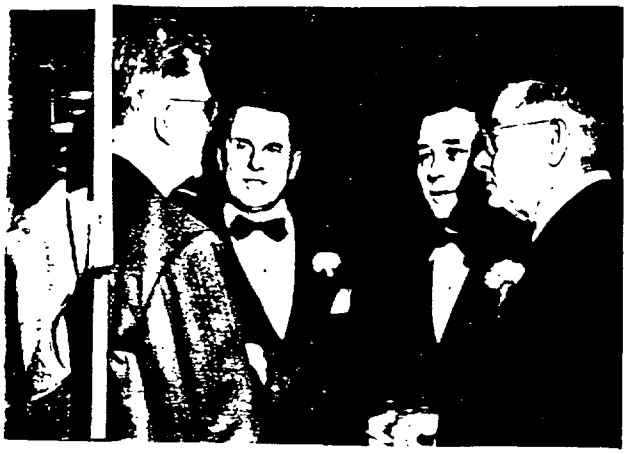
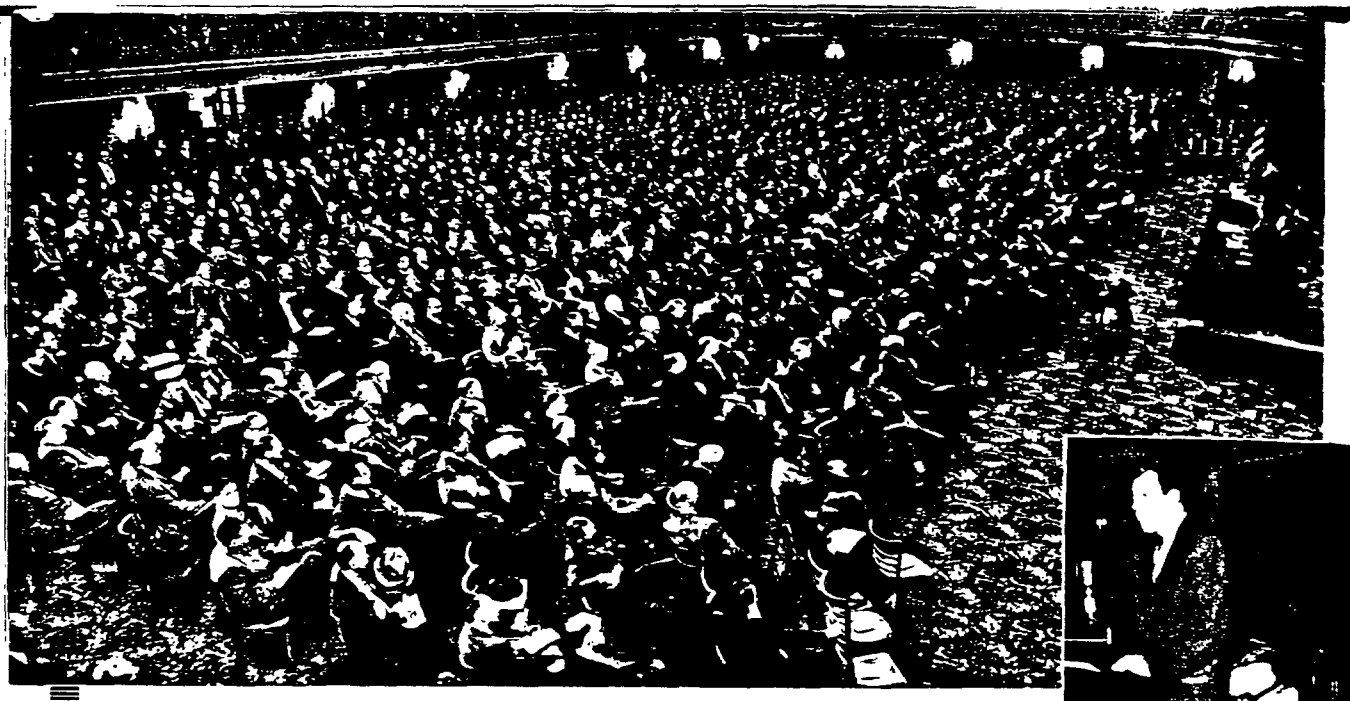




This huge audience attended the opening session of the Marketing Division.

William Simon delivering his paper, as J. Howard Marshall presides.

Marketing

TWO GROUP SESSIONS, attended by overflow audiences, were sponsored by the API Division of Marketing during the convention.

Speaking at the opening session, Vice President Alben W. Barkley cited figures on oil consumption and known reserves, and said, "It is easy to see that we could be out of oil in 12 years." He added, however, "I did not say it would happen," observing that new discoveries could be expected to continue.

E. Holley Poe, formerly Director of Natural Gas in the PAW, outlined the forthcoming impact of natural gas on the fuel-oil market, calling it "real competition" that "will grow instead of diminish." William Simon, of the law firm of Miller, Gorham, Wescott and Adams, spoke on "The Legality Under the Patman Act of the Good Faith Competition Which Is Required by the Sherman Act."

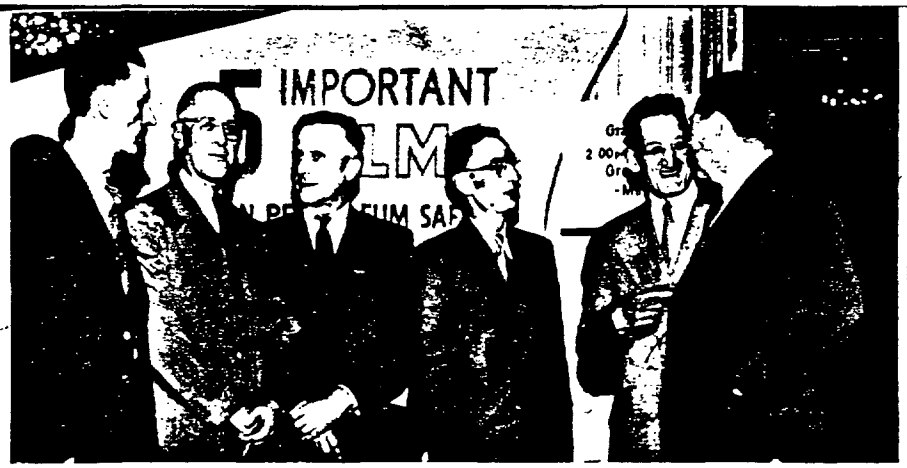
The second Marketing session heard John Dressler, executive secretary of the New Jersey Gasoline Retailers Assn., defend the fair trade laws as necessary for small business. The meeting also heard Conger Reynolds, OIIC chairman.

Below, E. Holley Poe on the rostrum, as he discussed the impact of natural gas.

Vice President Barkley, as he addressed the opening session of the Marketing Division.

Striking an informal pose, Vice President Barkley chats with reporters during an impromptu press conference prior to his convention address.

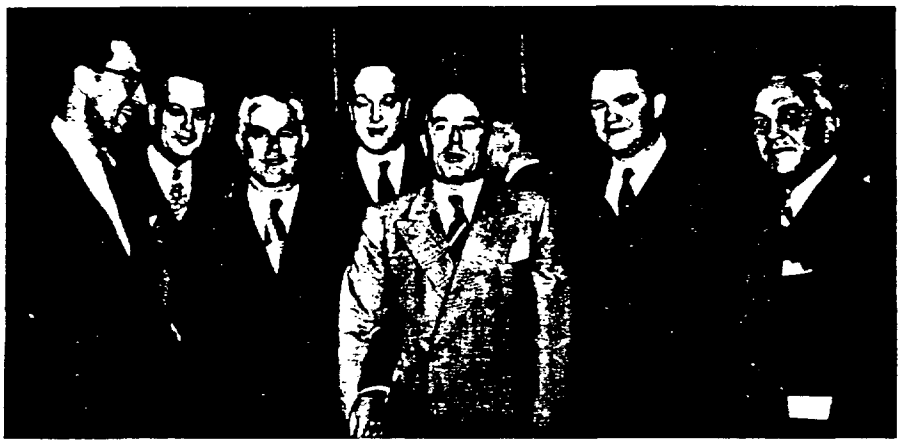
ETC 24248



Snapped outside the Marketing session were Douglas J. Fletcher, executive secretary, Ontario Gasoline Retailers Assn.; Ralph F. Markey, executive secretary, Gasoline Retailers of Indiana; Harry K. Franklin, secretary, National Congress of Petroleum Retailers; Charles A. Hutson, director, Gasoline Retailers of Indiana; George D. Runyan, president, Gasoline Retailers Assn. of Fort Wayne; and H. E. Sauerteig, Fort Wayne service station operator.

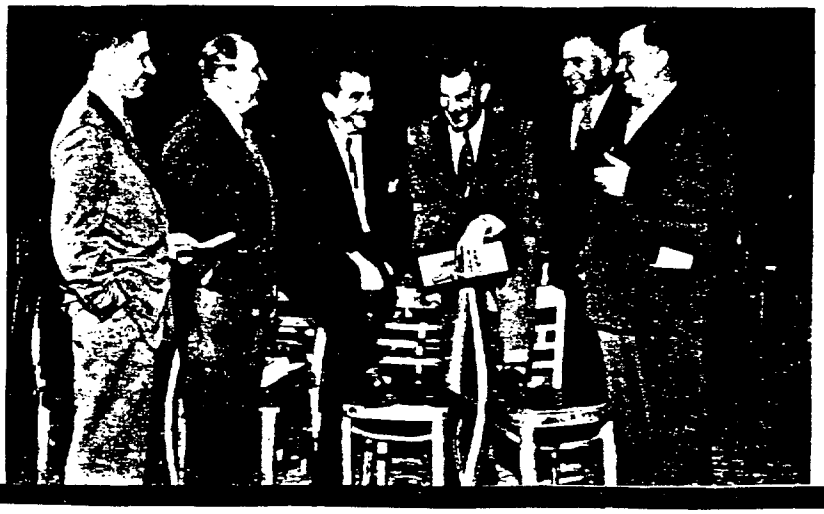
Above, John Crawford, of Great Lakes Refining, and Joseph J. King, of Tennessee Gas Transmission.

Above, G. L. Gano, of Cities Service Refining; O. B. Bingham, of Henry H. Cross; and H. L. Williford, of Hunt Oil . . . Below, W. R. Schaefer, president of Schaefer Oil, chats with O. J. Shaw, president of Lincoln Oil. Mr. Schaefer is president of the Nebraska Petroleum Marketing Assn.



Another Marketing audience group included Richard C. Murphy, of Ethyl; R. R. Potts, Socony-Vacuum; Willard Wright, Sun; Herbert Willetts, Socony-Vacuum; Dwight Colley, vice president, Atlantic; George McDaniel, Socony-Vacuum; and F. M. Neall, Atlantic.

Having an informal get-together are John W. Nerlinger, Jr., corresponding secretary, and Rankin Peck, president, the National Congress of Petroleum Retailers; Alan Feinman, president, Gasoline Retailers Assn. of New York State; Harry J. Doyle, assistant to the president, and John Dressler, executive secretary, the New Jersey Gasoline Retailers Assn.; and Louis M. Faber, executive secretary, the Retail Gasoline Dealers Assn. of Milwaukee . . . Below, right, John R. Nelson, vice president, and A. L. Bailey, president, Canfield Oil, chat with D. E. Hoffman, of Tidewater.



ETC 24249

A view of the speakers' table during the second Marketing session. Seated are Hugh Thatcher, John Dressler, and John W. Frey. Chairman J. Howard Marshall is at the microphone.

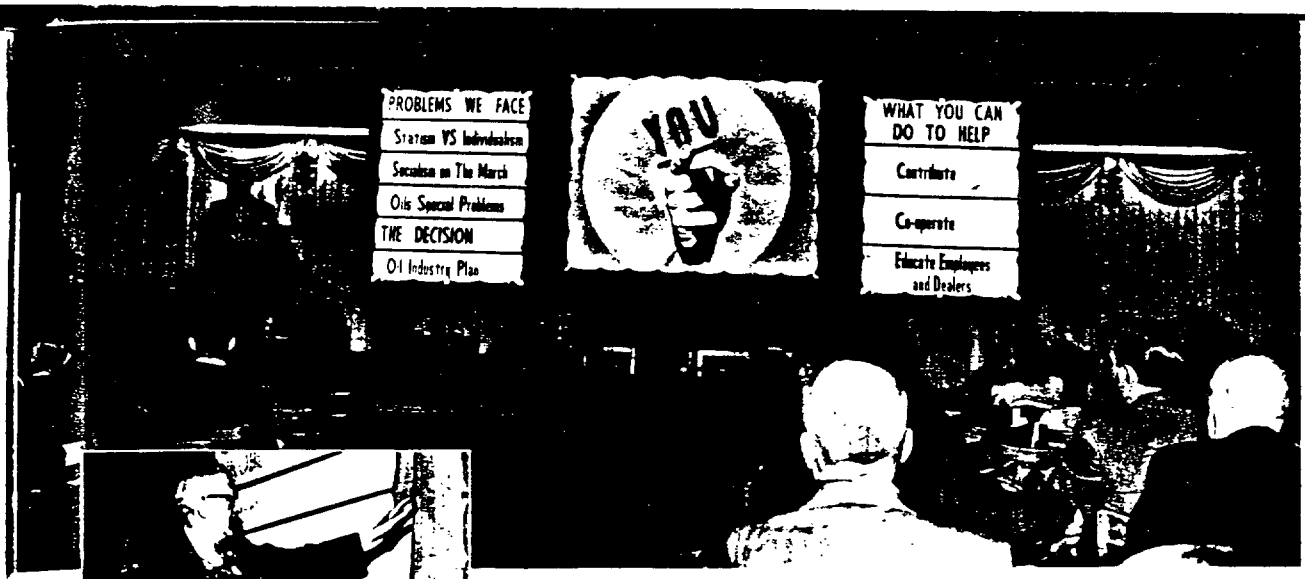
A. L. Nickerson, of Socony-Vacuum, program chairman of the Marketing Division, makes a statement from the floor.

ETC 24250

Above, B. L. Majewski, vice president of Deep Rock Oil, reporting for committee on jobber service.

Left, R. W. McDowell, president of Mid-Continent Petroleum, speaking for the resolutions committee, of which he is the chairman.

Below, the nominating committee of the Division of Marketing, as it met Monday morning to nominate members to serve on the Division's general committee for the year 1950 . . . Lower left, Rex S. Blazer, president of Allied Oil and chairman of the nominating committee, as he delivered the committee's report to the full Division.



Conger Reynolds, chairman of the OIIC, makes a point during the OIIC presentation (top of page) before the second Marketing group session.

A HIGHLIGHT of the second Marketing session was a presentation of a report on "The Oil Industry Information Committee in Action" before the assembled marketers.

Conger Reynolds, OIIC chairman for 1949, reviewed the work and results of the oil industry's information program to date, and emphasized the importance of employees, dealers and their helpers as channels of communication with the public.

Urging marketers to support the program fully, Mr. Reynolds said, "It is particularly important that marketers know the industry program better. They are the salesmen. They are in the branch of the industry that must carry the lion's share of the selling job we have to do with the American public." Admiral H. B. Miller, George Freyermuth, and Ralph Champlin discussed individual phases of the OIIC program.

Admiral H. B. Miller, of the API; George Freyermuth, of Standard Oil (N. J.); and Ralph C. Champlin, of Ethyl, participated in the OIIC presentation.

The skit at the right, presented before the Marketing audience, illustrated how employee group discussions, based on material provided by the OIIC, are of great assistance in carrying forward the industry's program of education.

William M. Holaday addressing the Refining session on "Fuels — Their Present and Future Utilization."

Walter G. Whitman was the second speaker on the Refining program, devoted to "Fuels of the Future."

Courtney C. Brown, describing the changed pattern of seasonal demands, told how the industry's peak load has shifted from the summer to the winter.

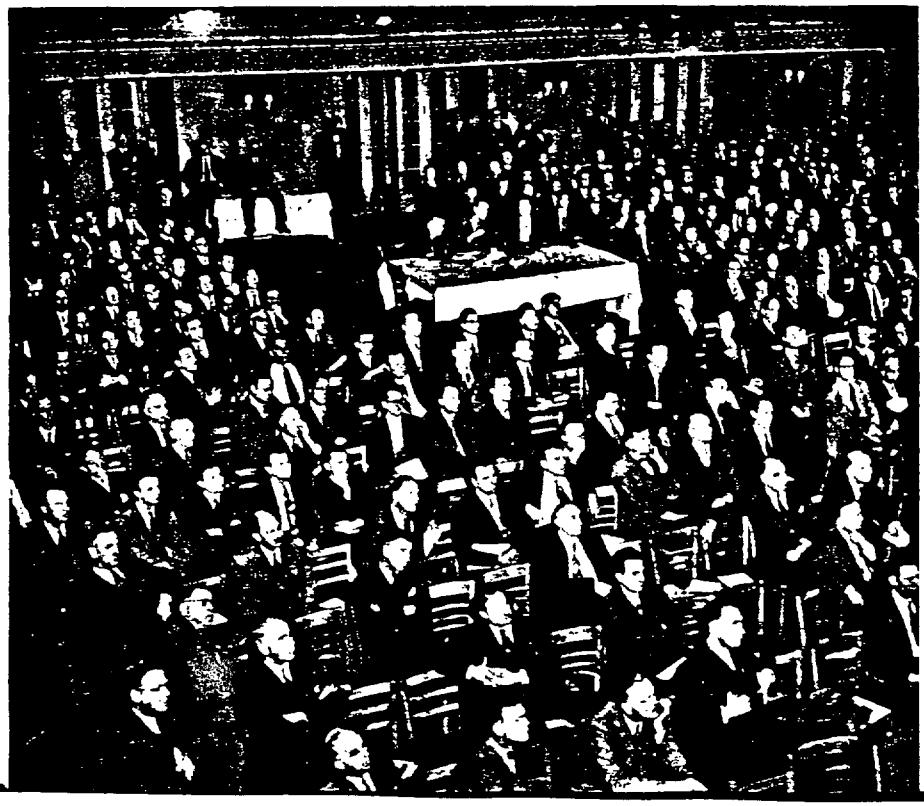
Refining

IN A COMPREHENSIVE survey on the utilization of fuels, W. M. Holaday, of Socony-Vacuum, told the Refining group session that transportation offered the greatest opportunity for more efficient utilization. Of all forms of transportation, the automotive field is the most fertile for future gains, he said, citing the higher efficiencies that can be achieved through further improvements in fuels and engines.

Speaking on "Liquid Fuel Supplies and National Security," Walter G. Whitman, of the Massachusetts Institute of Technology, said that joint industry-government planning is essential in the event of a national emergency. "If national security demands that actions be taken which are not sound investments for private enterprise," he added, "the people as a whole, through their government, must accept the responsibility and pay the cost."

Discussing the effects of shifting seasonal demands on refinery operations, Courtney C. Brown, of Standard Oil (N. J.), said that greater storage capacity is needed as a result. "Very large capital savings could be made," he said, "if refiners should gradually adopt the operating practice of letting the changing seasonal requirements fall more on storage, and less on changing volumes of currently produced supplies."

ETC 24252



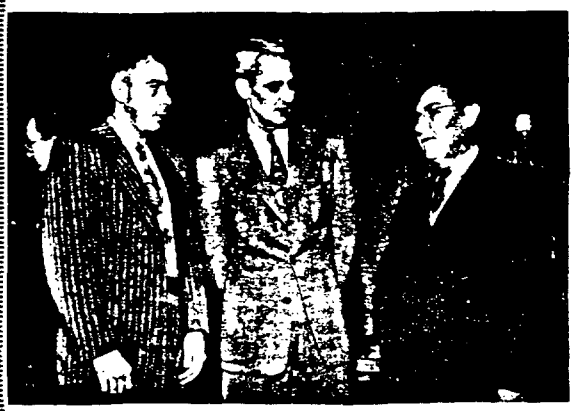
Left, a part of the Refining group audience, at which Chester F. Smith (below), of Standard Oil (N.J.), presided.

Above, a meeting of the Refining Division's nominating committee, at which it designated members to the Division's general committee . . . Right, H. F. Glair of Standard of Indiana, chairman of the nominating committee, delivering his committee's report at the Refining session.

Having a pre-session get-together are W. H. Fowler, of Pure Oil; Andy Lenz, of Sinclair Refining; and Martin Alspaugh, of Ethyl.

S. H. McAllister, of Shell Development; C. E. Davis, vice president of Shell Oil; and L. C. Burroughs, also of Shell Oil, look over some convention literature.

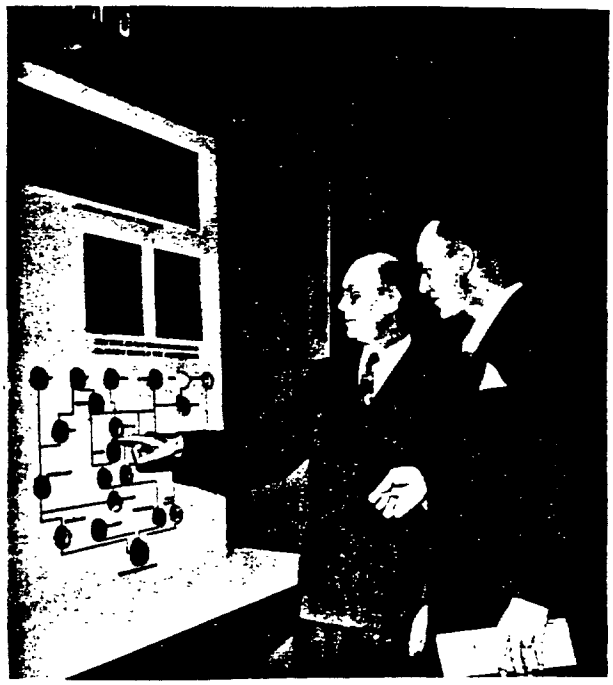
Chatting together, below right, are L. L. O'Dell, of Ohio Oil; Jack D. Fuller, of Ethyl; and Frank W. McCurry, vice president, Derby Oil.



Below, Dr. A. Leslie Horton, of the University of Cincinnati; H. G. M. Fischer and R. M. Shepardson, of Standard Oil Development; and Dr. Charles A. Swan, of Standard Oil of Ohio.

ETC 24253

Pictured during a conversation before attending the Refining group session are Oscar B. Lewis, of Ethyl, and Harry W. McCobb, a director of Standard-Vacuum.



A special exhibit in connection with the convention attracts the attention of George J. Peterschmidt, vice president of El Dorado Refining, and R. J. Oosdyke, of Mid-West Refineries.

In the threesome at the left are R. J. Brown, president of R. J. Brown Co.; Howard E. Felt, vice president of Warren Petroleum; and J. M. Reidy, also of Warren ... Lower left, discussing a piece of convention literature, are Paul Endacott, executive vice president of Phillips Petroleum; Henry D. Moyle; and Stanley Learned, vice president of Phillips.

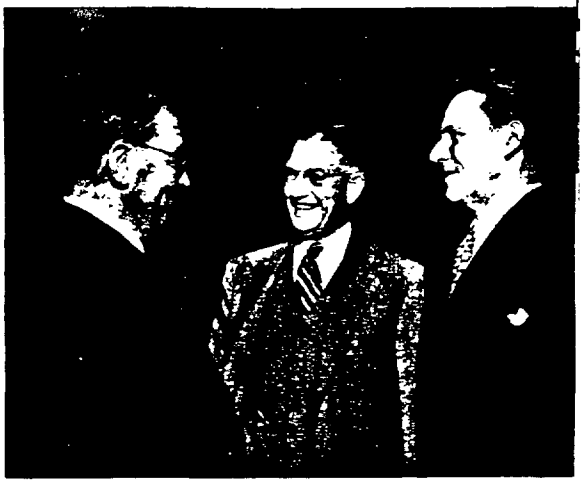
Telephoning a convention friend is Merrill Utley, a director of Standard of Kentucky.

Two Louisville Refining representatives — J. J. Loudermill and James J. Gaskell.

ETC 24254

The annual meeting of the 25 Year Club (above) was featured by the election of Alexander Fraser (inset), Shell Oil executive committee chairman, as new president of the Club.

Here and There



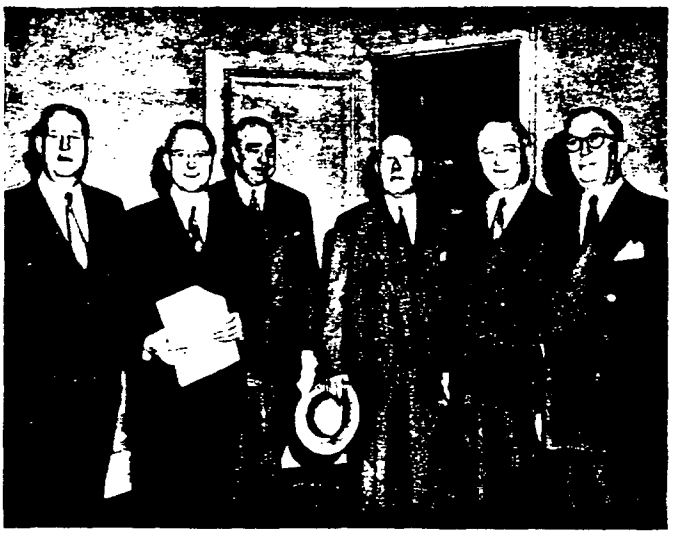
A get-together of three Californians — S. M. Wagner, Ethyl's Western regional manager; E. J. McClanahan, vice president of Standard of California; and Meredith Littlefield, of Ethyl's San Francisco office.

Up from Beaumont was W. B. Johnson, of Magnolia Petroleum.

A Stoll Oil representative present was John J. Kirchner.

D. P. Barnard, of Standard of Indiana, chairman of the Automotive Research Committee, which met in advance of the convention's formal opening.

ETC 24255



API directors all are B. I. Graves, vice president of Tide Water Associated Oil; Sidney A. Swensrud, president of Gulf Oil; J. N. Pew, Jr., board chairman of Sun Oil; W. G. Skelly, president of Skelly Oil; R. L. Wheelock, president of Wheelock and Collins; and E. H. Salrin, vice president of Tide Water Associated Oil.

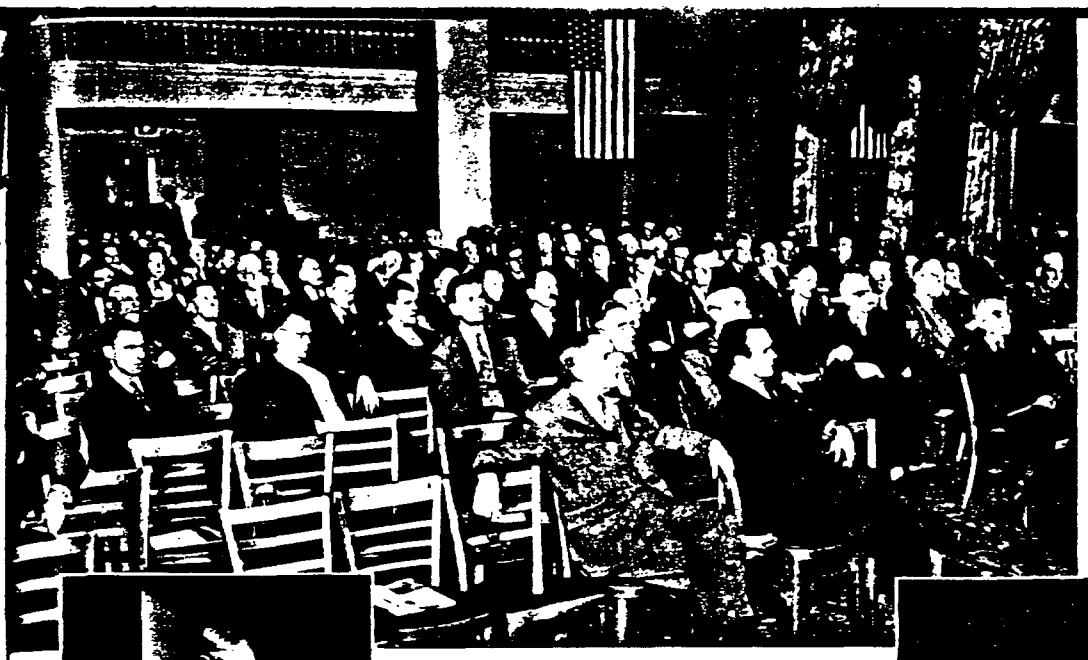
The Committee on Refinery Equipment, as it met in session on Tuesday afternoon. Bonner H. Barnes, of Gulf Oil, is chairman of the committee.

Time out for a chat is taken by Roland Whealy, of Ashland Oil, and S. T. Pruitt, of Ethyl.

A round-table discussion among C. W. Hoffer, of Washington, D. C.; Charles W. Rippie, of Lukens Steel; and H. E. Zoller, president of Derby Oil.

Two Wood River Oil men — H. C. Allen and N. W. Kreit — hold a Stevens lobby conversation with Grover Kilgore, of Halliburton Oil Well Cementing Co.

ETC 24256



Part of the audience which attended the Tuesday evening Public Relations group session.

Right, J. B. Thomas, president of The Texas Electric Co., as he gave the "Case History of Federal Encroachment Upon the Electric Industry."

The group session also heard Dr. Claude Robinson, president of Opinion Research. Title of his talk was "The Public Looks at the Oil Industry."

Public Relations

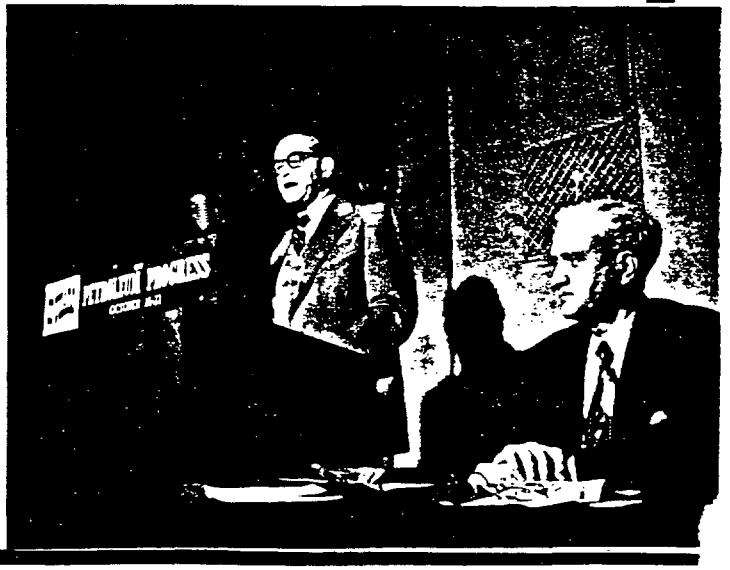
A FIRM WARNING that the petroleum industry must take steps to avoid "the progress made towards socialization" of his own industry was voiced by the head of a Fort Worth electric power company in the opening speech of the Public Relations group session.

J. B. Thomas, president of The Texas Electric Co., termed Federal encroachment on the electric industry "the first step in the socialization of the whole industry of the United States."

Commenting upon Mr. Thomas's address, John M. Lovejoy said that the oil industry, through its industry-wide public relations program, had already begun to fight the "threat of creeping socialistic control." "This is the menace to which all our public relations programs must be addressed," he said.

A third speaker was Dr. Claude Robinson, who analyzed the latest public opinion survey taken on behalf of the oil industry.

Continuance of the industry's public relations program was voted unanimously by the API board of directors, and a budget of $1,811,000 approved. The board also authorized a consolidation of the working staff. Under the plan, the Fred Eldean Organization is retained as public relations counsel, and administrative responsibility for the program is transferred to the office of H. B. Miller, API director of information.



John M. Lovejoy, Seaboard Oil president, as he addressed the session on "The Oil Industry Looks at the Public." Seated is Conger Reynolds, who presided.

ETC 24257

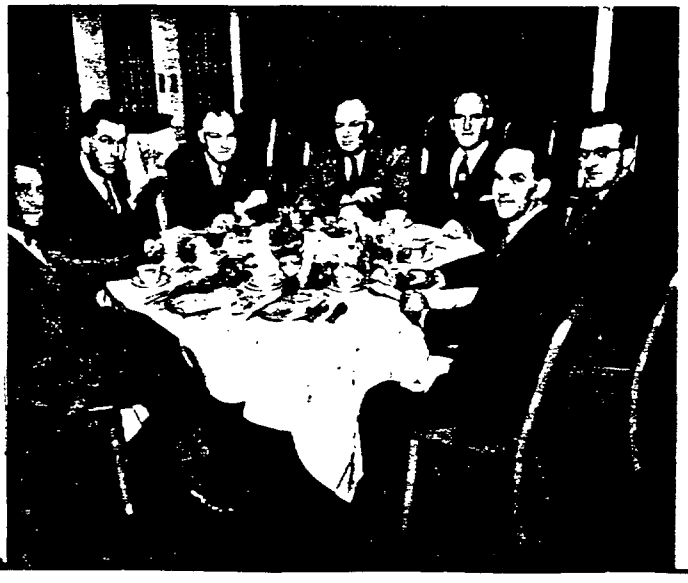
Above and upper right are views of the Monday afternoon meeting of the Oil Industry Information Committee and OIIC district chairmen. The first day of the convention was an especially busy one for OIIC members. In addition to the afternoon meeting, the OIIC held a Monday morning session and then met again at lunch. OIIC district chairmen also met Monday morning.

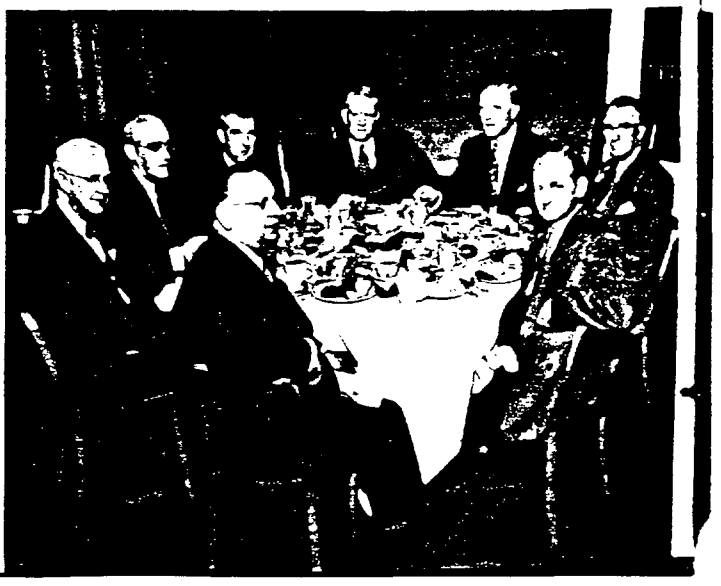
Conger Reynolds and George Freyermuth confer, during a session, on the oil industry's public relations program. Mr. Freyermuth succeeds Mr. Reynolds as chairman of the OIIC.

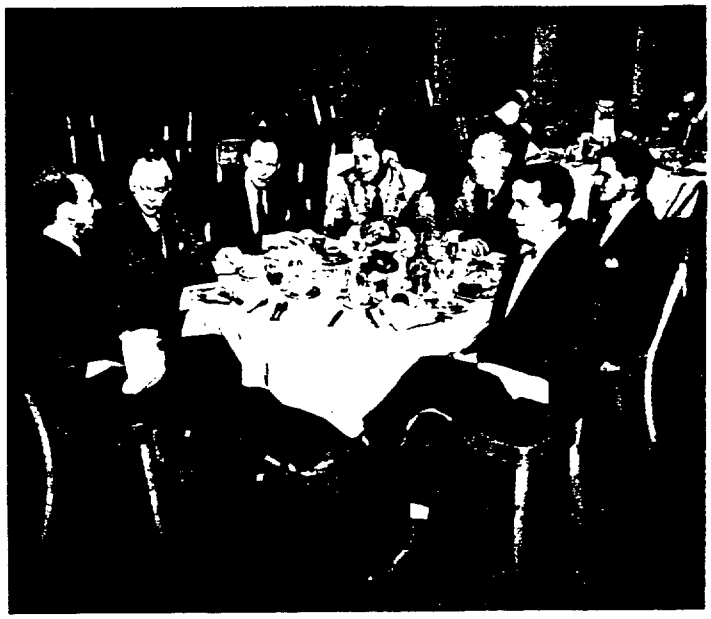
ETC 24258

The photos below and on the opposite page are of the Monday luncheon of the OIIC. Below, clockwise, are Philip C. Humphrey, of The Texas Co.; Daniel C. McCarthy, of Socony-Vacuum; W. B. Curtis, of General Petroleum; J. A. Lentz, of Continental Oil; Lars Carlson and James S. Haskins, field representatives for OIIC; and Jack Dupree, representative for Socony-Vacuum.

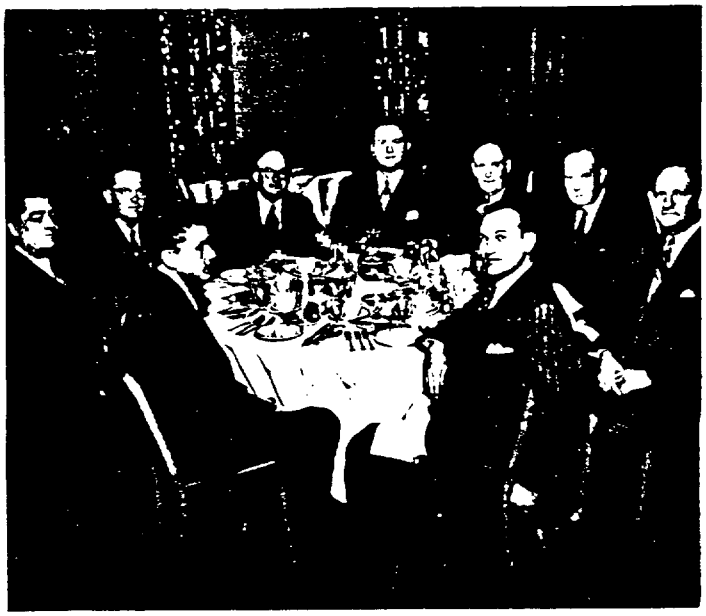
OIIC luncheon diners at this table are L. L. Niedrach and Donald R. Waugh, field representatives for OIIC; Joseph W. Butler, president of Butler Oil; Joseph H. Mader, of the OIIC field staff; W. E. Black, vice president of Esso Standard of Pa.; Keeton Arnett, of the Fred Eldean Organization; Samuel B. Pettingill, of Pure Oil; and Fred Eldean, president, Eldean Organization.





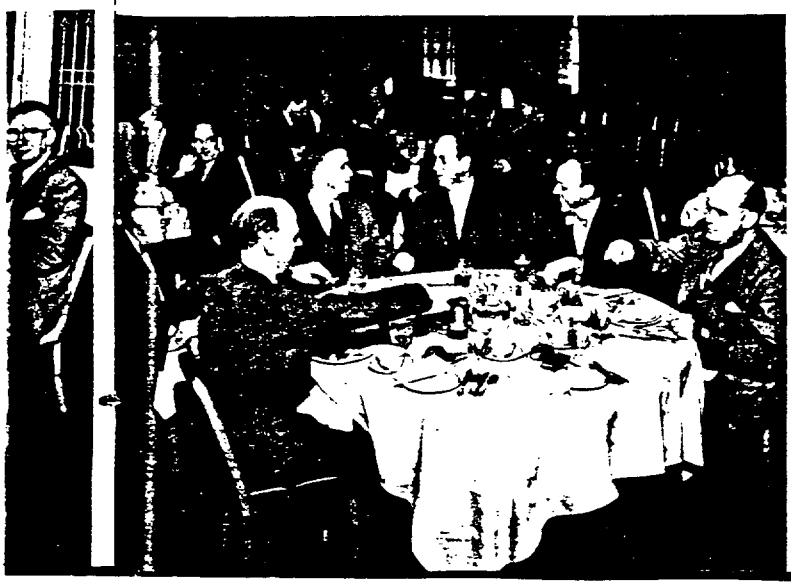


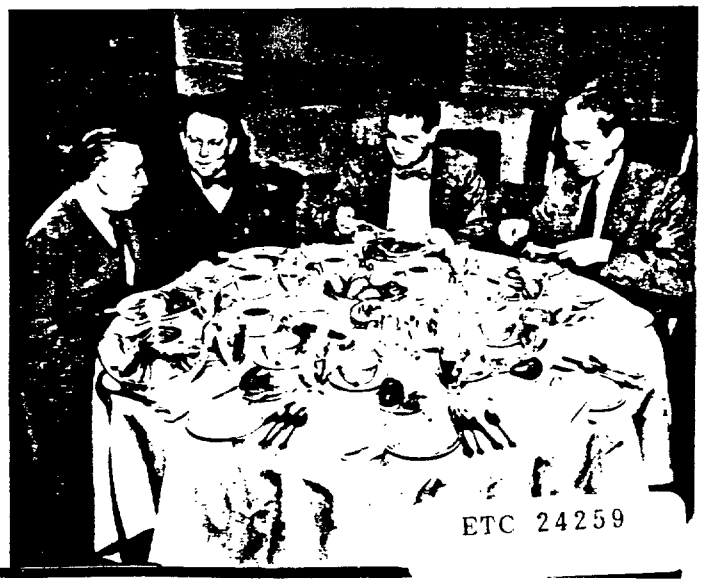
At right are Jack Cohane, OIIC advertising agency representative; Richard Rollins, of Atlantic Refining; H. L. Curtis, of Shell Oil; J. H. Sembower, of Shell Oil; Frank Rehm, vice president of Shell Oil; C. Haines Finnell, of Union Oil; and John Dryer, of Foote, Cone and Belding agency.



In the center right photo, clockwise from the left foreground, are Paul Cain, of the Southwest OIIC district; William N. Finnegan, Jr., of Humble Oil; Stanton K. Smith, president of Smith Oil; Wiley Moore, board chairman of Moore, Inc.; R. E. Featherston, of the OIIC field staff; Harry Trower, vice president of Phillips Petroleum; J. B. Hutchinson, vice president of Aetna Oil; L. C. Pfaff, of Socony-Vacuum; and Frederick Grinnell, of the OIIC field staff.

In the luncheon group below are J. M. Halliwell and Warren Drew, of Gulf Oil; Jack Clarke, of Lion Oil; Douglas Campbell, of Pure Oil; M. S. Hauser, of Ohio Oil; and C. E. Simons, of Texas Mid-Continent Oil and Gas Assn. . . . Below, right, Clarel B. Mapes, of Mid-Continent Oil and Gas Assn.; Ben Ames and Melvin J. Rupp, field representatives for the OIIC; and Upshur Evans, of Standard of Ohio.





ETC 24259

A luncheon meeting of the public relations committee of the API board of directors. John M. Lovejoy is chairman of the group.

W. S. Hallanan and K. S. Adams, presidents of Plymouth Oil and Phillips. Both are on the board's public relations committee.

Discussing the industry's public relations program for the coming year are James S. Haskins, of OIIC field staff, and Admiral H. B. Miller, the API director of information.

One of the new OIIC vice chairmen is William J. Gerwe, of Socony-Vacuum (below). The others are Philip Humphrey, of The Texas Co., and Stanton Smith, of Smith Oil.

Avidly studying one company's report on Oil Progress Week activities is this group of OIIC members. They are Paul Hodges, of Cities Service; Jack Clarke, of Lion Oil; Ben Ames, field representative of the OIIC; M. S. Hauser, of Ohio Oil; and J. B. Hutchinson, of Aetna Oil.

ETC 24260

P. L. Guarin, of Shell, delivering a paper on rotary percussion drilling.

Above, a view of the audience that attended the opening session of the Production Division, held on Tuesday.

Production

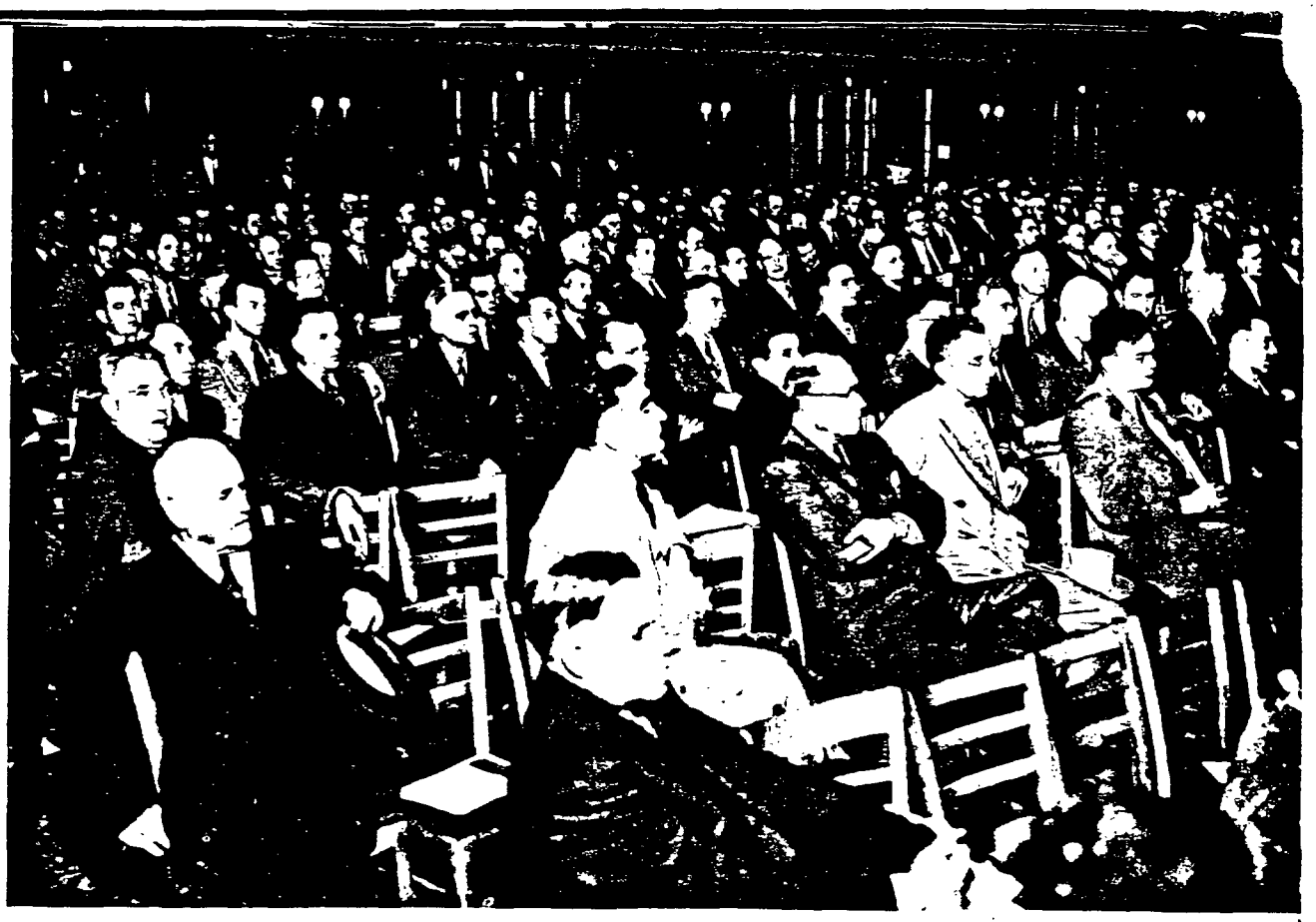
Above, John M. Payne, of Shell, speaking, and co-chairmen R. O. Garrett and G. E. Cannon.

Two other speakers at the opening session were B. L. Moore, of Humble, and S. B. Sargent, of Sargent Engineering.

TWO GROUP SESSIONS were sponsored by the Division of Production during the API convention. The first session heard four speakers present papers on such subjects as rotary percussion drilling; the equipment and techniques necessary for commercial drilling at 20,000 feet; a discussion of factors affecting the design of oil-well sucker-rod strings; and a report on the value of a higher voltage system for electrically pumping oil wells. R. O. Garrett, of Arkansas Fuel Oil, and George E. Cannon, of Humble, presided.

At the second session, presided over by H. H. Kaveler, of Phillips Petroleum, and Paul Andrews, of Signal Oil and Gas, the audience heard G. B. Corless, of Standard Oil (N. J.), urge the same systematic approach in selecting and training company executives as is used in developing oil reserves. N. E. Tanner, Minister of Mines and Minerals of the Province of Alberta, reviewed various aspects of Canada's present oil development. J. V. Pennington, of Drilling Research, gave a history of drilling technology and its prospects. API Certificates of Appreciation were presented to seven men.

ETC 24261



The second group session of the Production Division was attended by this large audience.

J. V. Pennington spoke on drilling technology.

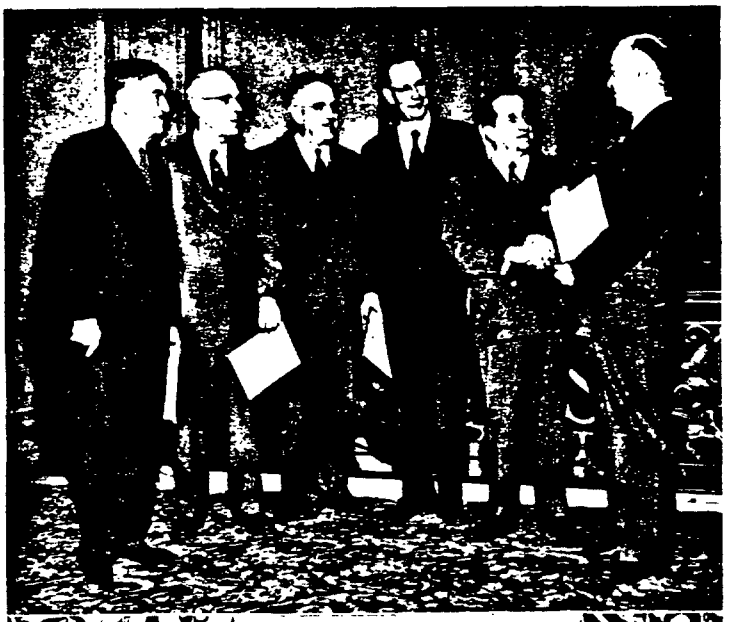
N. E. Tanner traced Canada's oil and gas development.

G. B. Corless gave a paper on executive development.

ETC 24262

Right, H. H. Kaveler, of Phillips Petroleum, and Paul Andrews, of Signal Oil, acted as co-chairmen of the concluding Production group session.

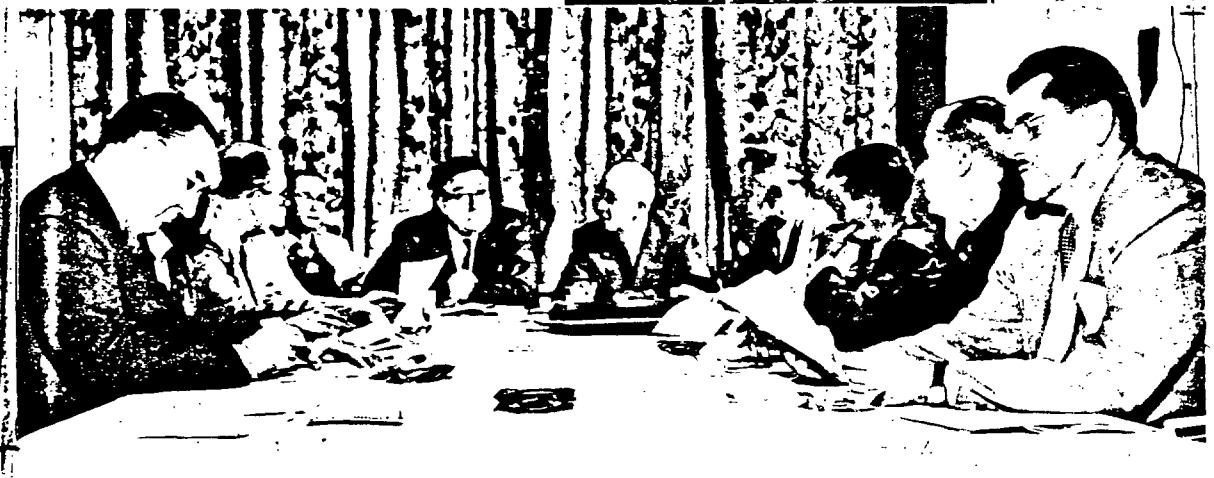
Above, Robert Siegel, of Socony-Vacuum, and R. V. Whetsel, of Cities Service, chat between sessions.



Above, right, R. L. Wheelock (far right), API vice president for Production, presents Certificates of Appreciation to five men for their contributions and services. They are E. J. Nicklos, president of Nicklos Drilling; W. G. Corey, of Lacy Oil Tool; H. W. Ladd, of Stanolind; H. N. Marsh, of General Petroleum; and John R. Suman, vice president, Standard Oil (N. J.). Other recipients of the awards were A. H. Riney, of Phillips Petroleum, and F. H. Schnoor, of Standard Oil of California.

J. C. Donnell, II (center), president of Ohio Oil, checks a convention program as G. F. Bish and H. H. Healy, also of Ohio Oil, look on.

Below, a business meeting of the nominating committee of the Production Division. George P. Bunn (center right) delivered the report of the committee.



ETC 24263

A moment's relaxation is enjoyed by Max M. Fisher, vice president of Aurora Gasoline, and Julian Frey, of Ethyl . . . Right, F. H. Moore, executive secretary, Retail Gasoline Dealers Assn. of Massachusetts, and Rankin Peck, president of the National Congress of Petroleum Retailers.

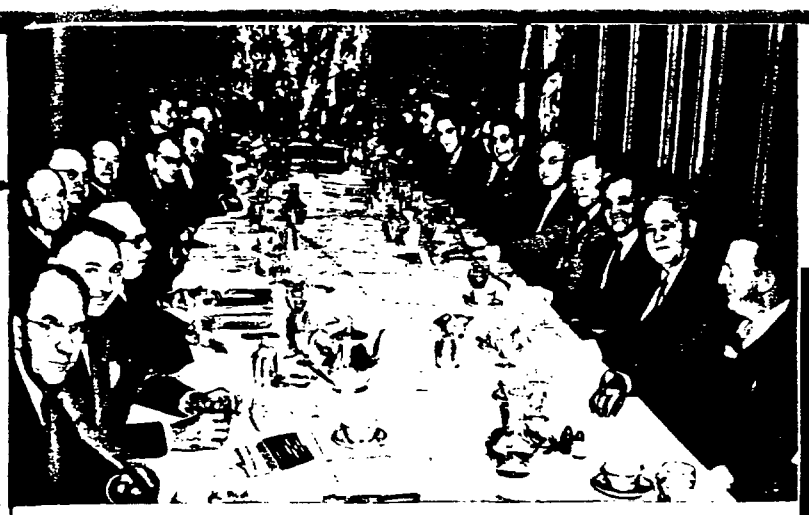
Between the Acts

Getting his shoes polished is Felix Simmons, of an Oklahoma City bank.

The Joint Automotive meeting. Presiding chairmen were J. J. Powelson, of Esso Standard and M. E. Nuttila, of Cities Service Oil.

Top, Carl A. Young, API director of production, visits with E. G. Gaylord, vice president of California Research . . . Above, A. L. Quackenboss, of Union Oil, and S. I. Hulse, vice president of Warren Petroleum.

ETC 24264

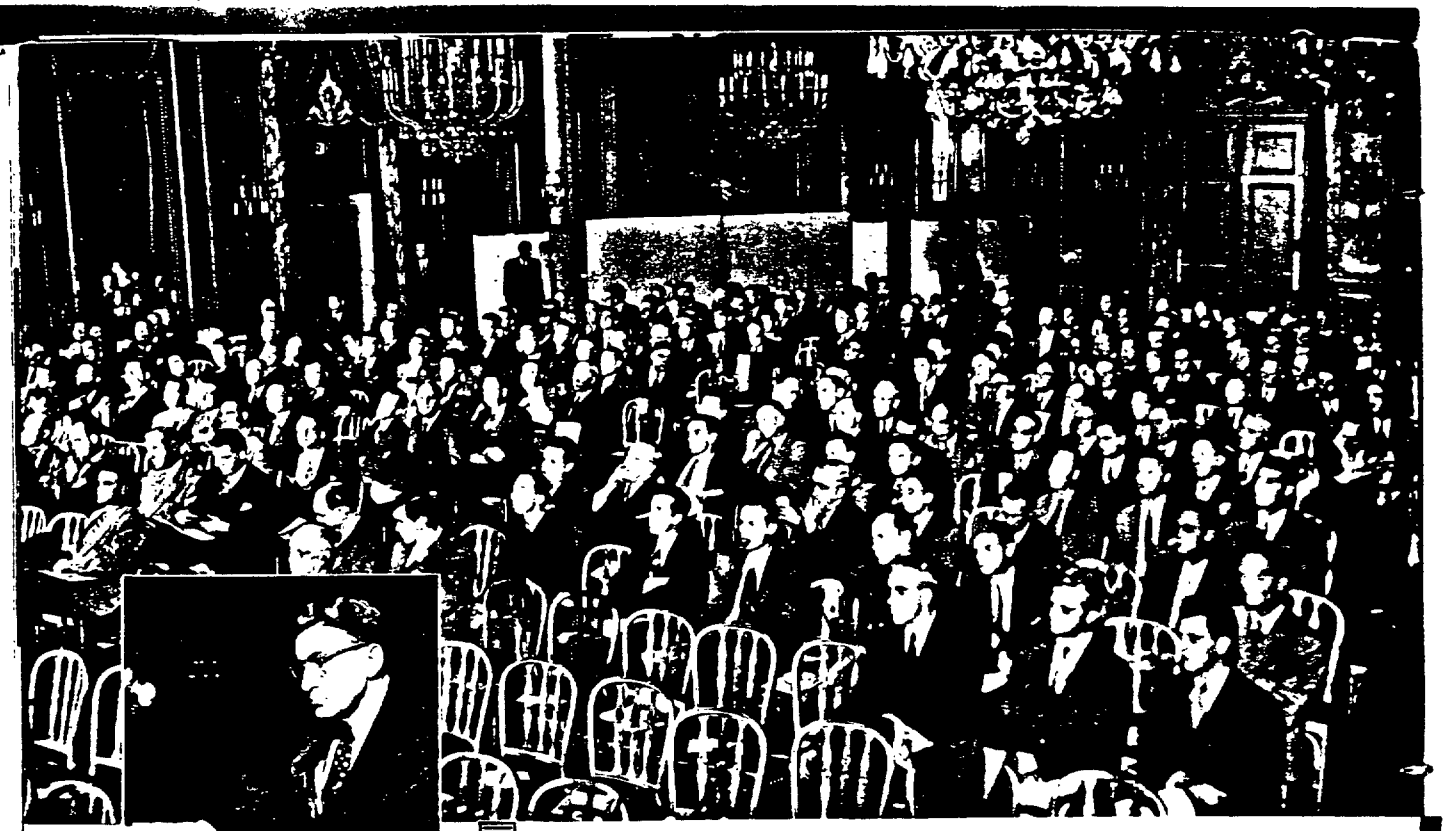


The API convention served as a reunion for many old associates. Above is a breakfast meeting of Bureau of Mines Alumni . . . Below, J. L. Ashworth and R. T. Scott, both of Standard of Indiana, stop at an information desk in the API registration room.

Below, photographed while waiting for an elevator are Dent Hand, of Bay Petroleum; Leo L. Leabo and C. O. Garbrecht, vice presidents of Bay Petroleum, and Robert A. Douglass, of Ethyl.

Top, discussing a knock-test exhibit are T. A. Eustice, of Kanotex Refining; J. B. Smith, vice president of Vickers Petroleum; Hoyt Ogram, of Kanotex; George Rose, of Ethyl; and Lloyd Lesh, vice president of Kanotex . . . Center, E. E. Thompson, of Mid-West Refineries; W. H. Polachek, of Ethyl; and C. W. Rice, of El Dorado Refining . . . Above, John Dalson, of Old Dutch Refining.

ETC 24265



Division of Transportation sessions, held at the Palmer House, were well-attended. This is the audience at the morning portion of the Pipe Line Symposium.

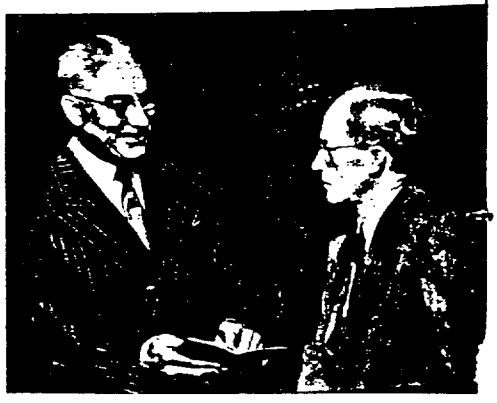
Transportation

AT ITS HEADQUARTERS in the Palmer House, the API's Division of Transportation held three group sessions, honored five of its members for services rendered through the years, and saw its director, James E. Moss, receive the Navy's highest civilian award for his outstanding wartime accomplishments as a port and tanker consultant to the Navy and the Coast Guard.

The first two group sessions, on Tuesday, were in the form of an all-day Pipe Line Symposium. Speakers represented six different oil and pipe line companies and a private consulting engineering firm.

Talks delivered during the Symposium covered a wide range of interest to those responsible for the movement of petroleum products. In addition to papers on technical matters, there was a discussion on the value of vocational training within the pipe line industry. The program also included the showing of a new Shell Pipe Line Company motion picture.

From top to bottom are Loren F. Kahle, executive vice president of Interprovincial Pipe Line, who presided at the Tuesday morning session; and speakers J. W. deGroot, president of Tuscarora Oil, and Gordon N. Scott, consulting engineer from Los Angeles.



ETC 24266

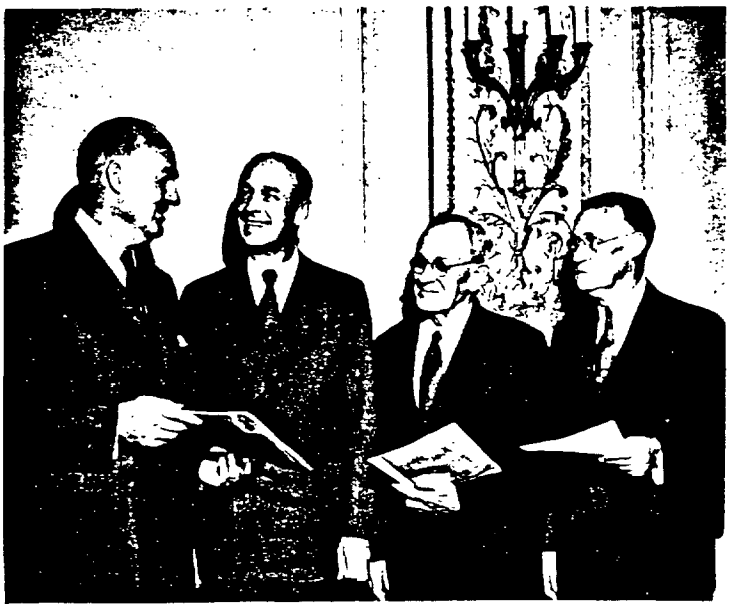
J. H. Peper, president of Buckeye Pipe Line, who presided Tuesday afternoon, and J. E. Green, of Shell Pipe Line, one of the speakers.

E. M. Henderson, of Interstate Oil Pipe Line, subbed as a speaker for Francis Coryell, also Interstate.

The importance of vocational training was discussed by J. R. Mills, Jr., of Standard of Indiana.

M. H. Shanahan, of Continental Oil, and R. Charles Nicholson, of Shell Pipe Line, co-authored a paper entitled "The Producer and the Pipeliner Discuss Lease-Tank Practices."

Certificates of Appreciation were presented to five men, two in absentia, by W. Alton Jones, retiring API vice president for Transportation (left). Those shown receiving their awards are T. E. Swigart, president of Shell Pipe Line and new API vice president for Transportation; James C. Bennett, now retired, formerly of Tide Water Associated Oil; and Porter L. Howard, of Sun Oil. Other recipients, not present, were Douglas S. Bushnell, now retired, formerly of Northern Group of Pipe Lines, and Harry G. Schad, of Atlantic Refining.



Opposite page, discussing the new pipe line construction movie issued by their company, and shown at the Pipe Line Symposium, are H. H. Anderson, vice president, and D. H. Lewis, of Shell Pipe Line.

ETC 24267

THE THIRD, and final, Transportation group session was held on Wednesday morning, with W. Alton Jones presiding.

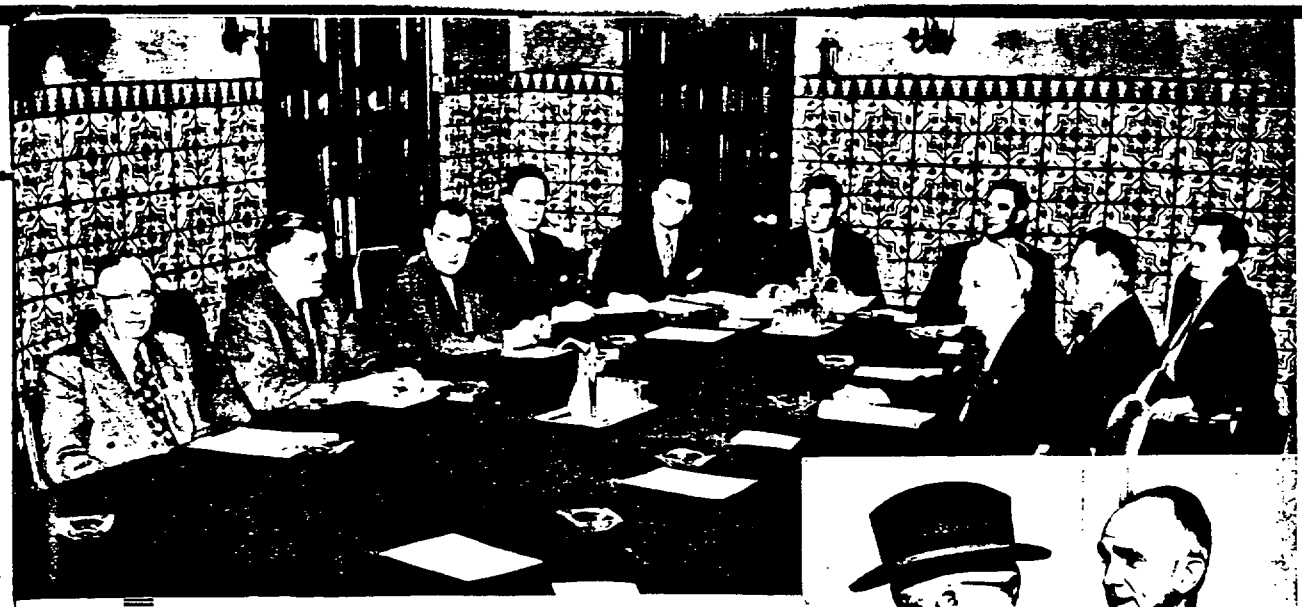
In addition to presentation of the five Certificates of Appreciation to members and the Navy award to Mr. Moss, the session heard three talks and the report of the Division's nominating committee.

The speakers were E. M. Webster, a member of the Federal Communications Commission; Charles L. Dearing, of the Brookings Institution in Washington, D. C.; and Thomas Pennington, of Humble Oil, who gave an illustrated talk on "Marine Transportation in Offshore Drilling and Production Operations." The paper was prepared jointly by Mr. Pennington and James C. Posgate, also of Humble.

Wednesday morning group session speakers were E. M. Webster (top), Charles L. Dearing (above), and Thomas Pennington (right).

James E. Moss, director of the Division of Transportation (center), receives the Navy Distinguished Public Service Award from Admiral Merlin G. O'Neill, assistant commandant of the U. S. Coast Guard, as W. Alton Jones looks on.

Pictured at the Transportation session are (top) E. J. Nopper, of Sun Oil; J. B. Land, of General Electric; and J. B. Glasby, of Atlantic Refining . . . Above, Robert Roberts, of Chicago; and Stanley Kleinheksel, L. R. Dickinson, and G. F. Brigance, of Socony-Vacuum.



The Transportation Division's nominating committee in session. F. R. Pratt, of Socony-Vacuum, committee chairman, presides.

Two company vice presidents who attended the sessions were C. R. Musgrave, of Phillips Petroleum, and F. A. Stivers, of Texas Pipe Line.

Right, W. W. Baker, vice president of Sinclair Refining, and G. F. Brigance, of Socony-Vacuum, as they left a Transportation meeting.

ETC 24269

The new president of the Pipe Liners Club, W. C. Kinsolving, of Sun Pipe Line, is congratulated by his predecessor, D. D. Irwin, of Pure Oil . . . Right, the annual banquet of the Pipe Liners Club.

Above, a meeting of the Aviation Advisory Committee. R. C. Oertel, of Esso Standard, is presiding . . . Right, T. J. Sullivan (seated, right), vice president of Gulf Oil, chats with J. B. Macauley and Richard C. Murphy, of Ethyl.

Above, F. M. Moffitt, of Ashland Oil . . . Right, L. C. Stevens and W. R. Finney, both of Standard Oil (N. J.) . . . Below, J. E. Powers, of U. S. Rubber, stops at a Stevens counter to purchase a *magazine*.

Four Texans talk things over — E. O. Buck, of the National Bank of Commerce; John W. Mecom, independent producer; E. P. Hayes, of Texaco; and C. W. Alcorn, vice president, Falcon Seaboard Drilling.

At Random

F. Baird-Smith, president, Refiners Transport and Terminal, checks over a paper, as J. J. Powelson, of Esso Standard Oil, and Leo Huff, of Pure Oil, look on.

ETC 24270

Charles Wheatley, president, Charles Wheatley Co., and C. S. Mitchell, of Cities Service Oil, talk things over as J. G. Norton, of Magnolia Pipe Line, pauses to light a cigarette.

Left, S. H. Reynolds, and P. F. Houserman, both of National Tube, stop for a chat with H. W. Ladd, of Stanolind . . . Below, W. M. Maddox, of Magnolia; S. F. Niness, president of Leaman Transportation; Porter L. Howard, of Sun; and R. H. Lamberton, of Union Tank Car.

Below, Earl Bartholomew, general manager of Ethyl's Research Laboratories, chats with John T. Cochrane, president of Coastal Petroleum.

Below, a meeting of the Defense Services Committee. Shown at the head table are J. C. Clarke, of Socony-Vacuum; Carl E. Cummings (standing), of The Texas Co.; and E. W. Berlin, of Standard-Vacuum.

ETC 24271

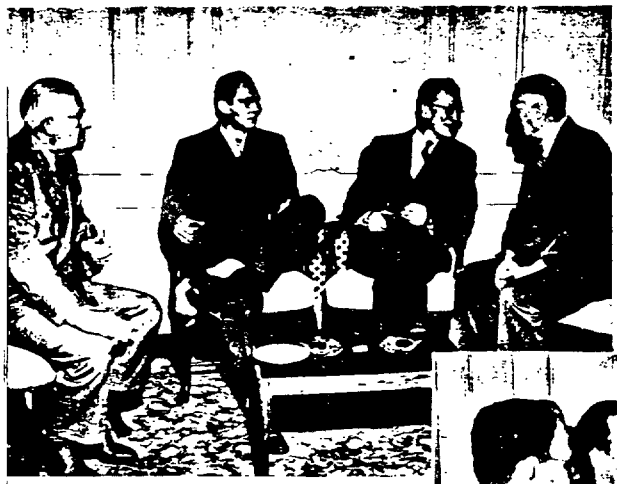
Two Continental Oil men — G. W. Evans and F. B. Haverfield — compare notes while waiting for a Transportation meeting to begin.

Snapped at the Clark Brothers party were Fred Hayes, of the host company; Ralph V. Hanrahan, president of Humble Pipe Line; and Paul Clark, president of Clark Brothers Co.

A view of part of the throng that attended the reception in the north ballroom of the Stevens.

Among those in attendance were J. B. O'Connor, executive vice president of Dresser Industries; Jack Walton, vice president of Ideco; Willard Johnson, president of Magcobar; William E. Dobbins, of Clark Brothers; and R. M. Chan, vice president of Magnolia Petroleum.

Right, S. J. Veenstra, of Asiatic Petroleum . . . Below, left, A. L. Conn, of Standard of Indiana; F. D. Rossini, of the Bureau of Standards; and E. C. Hughes, of Standard of Ohio . . . Below right, four Richfield Oil men from California. They are C. R. McKay, T. C. Cook, C. T. Brown, and C. A. Day, Jr.



At the Lummus party were C. A. Stover, president of Stover and Rust; S. A. Johnson, of Magnolia Petroleum; H. B. Cooke, of Gulf Oil; and C. S. Reed, president of Lummus.

ETC 24272

A. B. Anglin discusses 5W motor oil. Seated is Dayton P. Clark, chairman of the API Lubrication Committee.

Left, Mr. Clark as he delivered his address He said there is little economic justification for salvaging used lubricating oils.

Lubrication

A WASHINGTON agency's assertion that oil drain changes can be extended to 4,000 miles was challenged by a Lubrication group session speaker as "false and misleading."

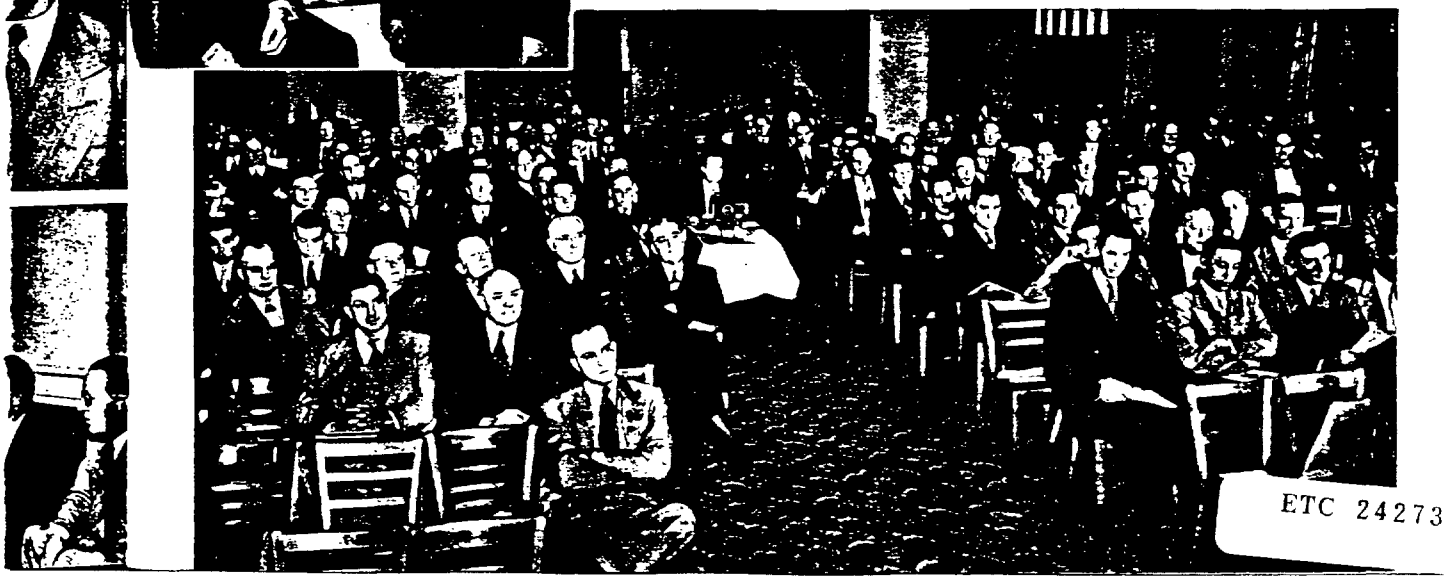
J. M. Koch, vice president of Quaker State Oil Refining Corp., said that this recommendation emanating from the Treasury Department's Bureau of Supply was based on vehicle performance not typical of the performance conditions encountered by average motorists.

Dayton P. Clark, of Gulf Oil, told the meeting that the economies gained by salvaging used lubricating oils are so small that they hardly justify the accompanying risk of shutdowns or increased maintenance costs.

Other Lubrication speakers were Ray Shaw, of Chek-Chart Corp.; A. T. Colwell, of Thompson Products; and A. B. Anglin, of British-American Oil. Mr. Anglin's paper on "Field Experiences with 5W Motor Oil" was discussed by H. C. Mougey, of General Motors Research, and Carl Georgi, of Quaker State Oil Refining.

Other speakers at the Lubrication session were A. T. Colwell, top, and J. M. Koch.

Left, Ray Shaw, a speaker, and B. G. Symon, of Shell Oil, who presided at the session . . . Below, part of the audience that attended the meeting.



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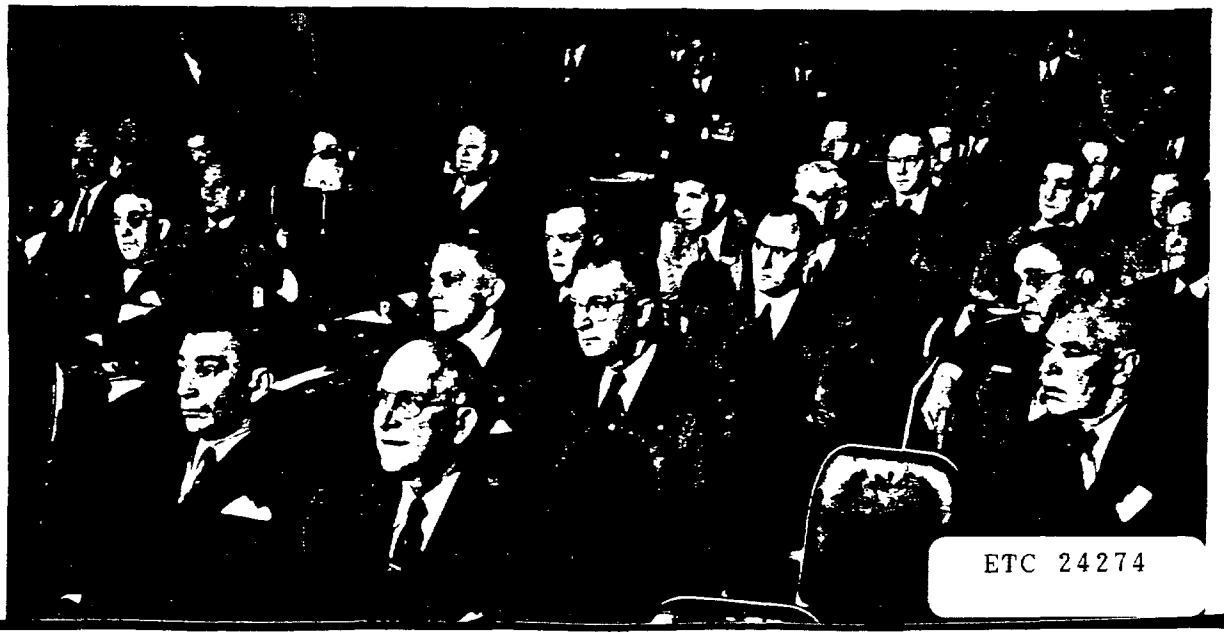
Above, a meeting of the Lubrication Committee . . . Below, Charles Hardwick (center), vice president of Ohio Oil, and two Ethyl regional managers—James E. Boudreau (left) and Harold Berg.

Above, William M. Murray, of Deep Rock, the new chairman of the Lubrication Committee, is shown talking with his vice chairman, Paul V. Keyser, (left), of Socony-Vacuum.

Below, a presentation holds the interest of the audience at a meeting of the Central Committee on Automotive Transportation.



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Roundup

Left, having an informal huddle are H. I. Moul, president, Coastal Tank Lines; Frank Grimm, president, O'Boyle Tank Lines; and W. W. Shannon, of Pure.

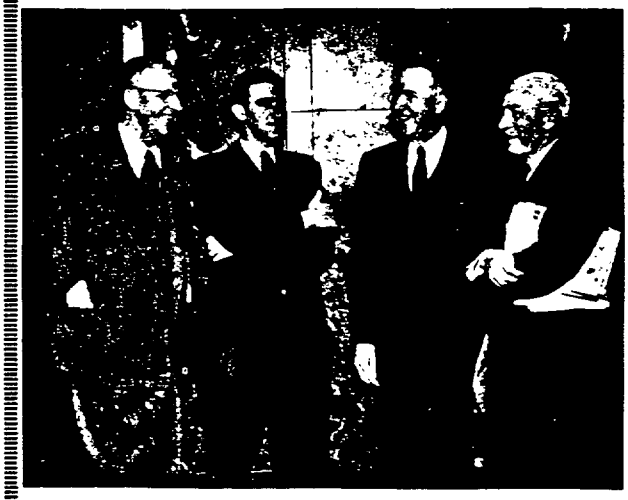
W. O. Cook and Al Pranger, both of International Derrick and Equipment, chatting before the start of a session.

W. S. Morris, vice president, East Texas Salt Water Disposal, enjoys a laugh with Sam S. Taylor, U. S. Bureau of Mines.

At a dinner table are A. J. Galloway and F. S. Clulow, Shell Oil vice presidents.

James E. Boudreau and Julian J. Frey, of Ethyl, chat with Joseph Adams, retired, and Dr. Clive M. Alexander, vice president, Aetna Oil.

C. O. Willson and George Weber, of the Oil and Gas Journal, visit with Dr. C. W. Rippie, of Lukens Steel, and Neil Buckley, vice president of Taylor Refining.



ETC 24275

Above, making up this Gulf foursome are T. R. Bibee, J. C. Phillips, B. B. Wescott, and J. L. Irvin . . . Above, right, are M. C. Hoffman, vice president, and Ralph Brandon, of Pan-Am Southern; D. F. Benton, of Standard of Indiana; and R. L. Aycock, George Moore, and H. S. Read, vice president of Pan-Am Southern.

Above, a meeting of the API's Research Project 45 Advisory Committee.

Below, a portion of the Committee on Analytical Research, as it met on Tuesday morning. J. B. Rather, Jr., of Socony-Vacuum, presided.

Above, this meeting of the (Main) Advisory Committee on Fundamental Research on Occurrence and Recovery of Petroleum was held in the Upper Tower.

ETC 24276

Fire Protection

A PANEL DISCUSSION on Mechanical Foam featured the Fire Protection session, held Wednesday morning in the Upper Tower. Four speakers participated in the discussion, at which J. E. Hill, of Union Oil, presided.

The speakers were C. H. Bunn, Jr., of Standard Oil Development, who led the discussion; R. T. Henderson, of Standard Oil of Ohio; O. W. Johnson, of Standard Oil of California; and R. L. Tuve, of the Naval Research Laboratory, Washington, D. C.

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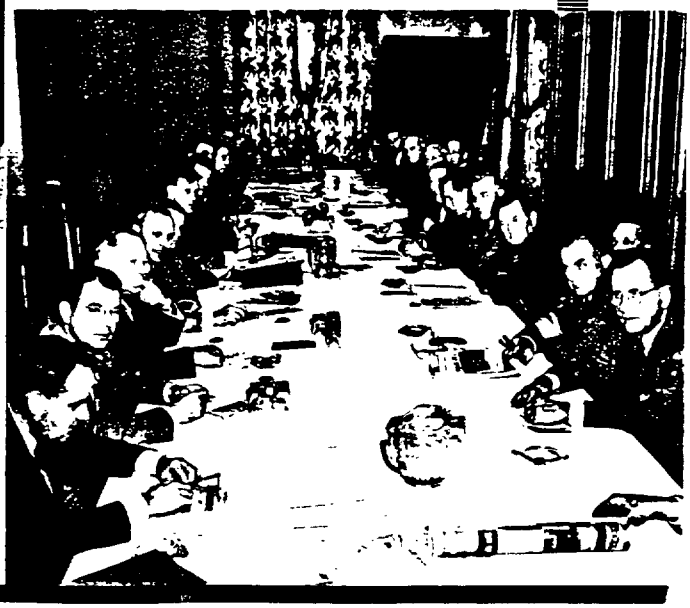
Above, a view of the speakers' table during the Fire Protection panel discussion on Mechanical Foam. Seated, left to right, are J. E. Hill, O. W. Johnson, C. H. Bunn, Jr., R. L. Tuve, and R. T. Henderson. Mr. Bunn led the panel discussion.

Shown at the head of the table, at the joint meeting of the Accident Prevention and Fire Protection committees, are Frank Wilson, of the API; J. E. Hill, of Union Oil; and F. R. McLean, of Socony-Vacuum. Mr. Hill is chairman of the Central Committee on Fire Protection and Mr. McLean is chairman of the Central Committee on Accident Prevention.

Below, a joint meeting was held by the Central Committee on Fire Protection and the Central Committee on Accident Prevention.



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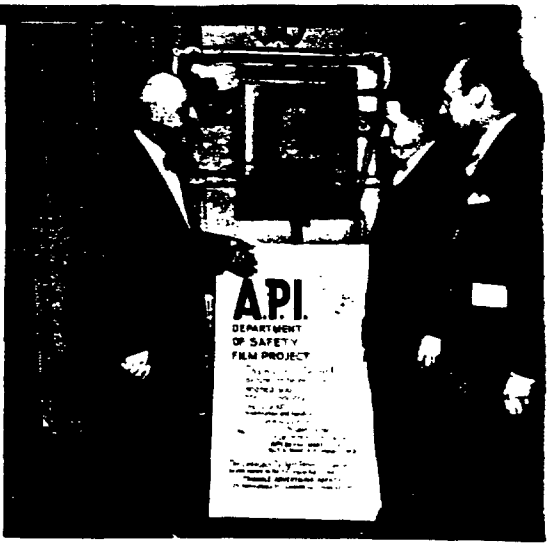
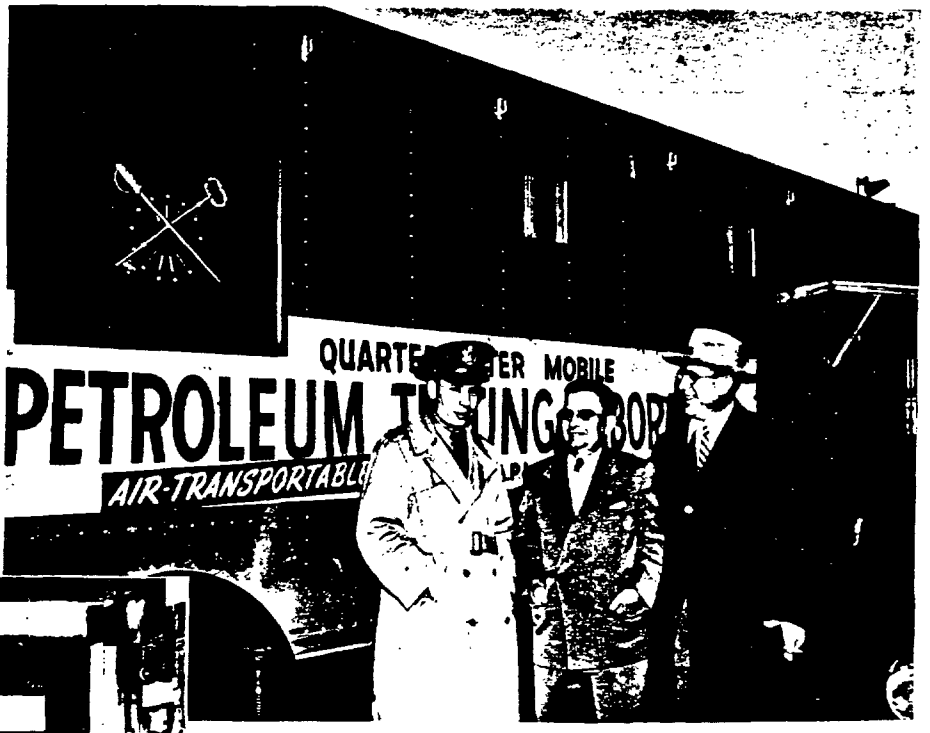


One of the exhibits at the API meeting was this presentation of the API Department of Safety film project. J. W. Small (left), who developed the film projector used, is discussing the project with H. T. Markee, of Phillips Petroleum, and F. R. McLean, of Socony-Vacuum.

Top, members of the Committee on Tank Cleaning discuss a new tank cleaning manual during a business meeting. They are O. W. Johnson, of Standard Oil of California; W. O. Wilson and R. D. Eberly, both of Standard Oil of Indiana; and Ellis Locher, of Ethyl . . . Above, E. O. Jones, of Ethyl, who is chairman of the Committee on Tank Cleaning.



Many APIers visited the Army Quartermaster mobile petroleum testing laboratory (above), which was stationed across the street from the Stevens. Standing beside the laboratory-on-wheels are Capt. Darwin Kitch and R. S. Crockett, of Neches Butane Products, together with Richard L. Allbritain, who designed the mobile unit . . . Left, L. L. Davis, of Continental Oil, inspects some of the laboratory's equipment.

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Offstage

NEWSPAPER MEN and special writers from all parts of the country were on hand to report the proceedings of the API meeting. There were few quiet moments for the press. Besides covering the eleven major meetings of the convention, they were kept busy writing up press conferences granted by various API speakers and interviews with other key figures.

The API meeting also served as a vehicle for informal reunions among many journalists. Among them was a meeting of the Association of Petroleum Writers, at which new officers were elected.

Retiring API President William R. Boyd, Jr. (right), enjoys a friendly give-and-take with reporters (above) during a convention press conference.

Left, J. A. McNally, and Ernest Collenberg, of the API staff, check on the number of API registrants.

The press room, below, served as headquarters for reporters and writers during the four-day meeting.

The Association of Petroleum Writers held a business meeting during the API convention, and elected new officers, below, for the coming year. They are Paul Wollstadt, of NPN, secretary-treasurer; Warren Baker, of World Oil, president; and Milburn Petty, Petty's Oil Letter, vice president.

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Except for a few committee meetings, the annual convention ended Thursday noon. Shown, leaving for home, is T. W. Nelson, of Magnolia Petroleum.

In this hotel check-out line are Robert Witherell, of Walworth Co.; W. H. Potter, of Guaranty Trust Co.; George B. Cushing, of National Supply Co.; M. M. Wilson, of Baldwin-Hill Co.; N. W. Kreit, of Wood River Oil; H. B. Dunn, a consulting engineer; and R. Cubicciotti, of L. Sonneborn Sons.

Checking train schedules back to Michigan is James P. Dunningan, president of Producers Refining.

Getting travel information are (l. to r.) R. L. Engstrom, of Hydril Corp.; and F. C. Schulze and L. L. Bower, of Waukesha Motors.

Participants in this sidewalk conversation, while awaiting a taxicab, are Don Carr, of Oil and Gas News, and Maurie Walters, of Lakeside Refining.

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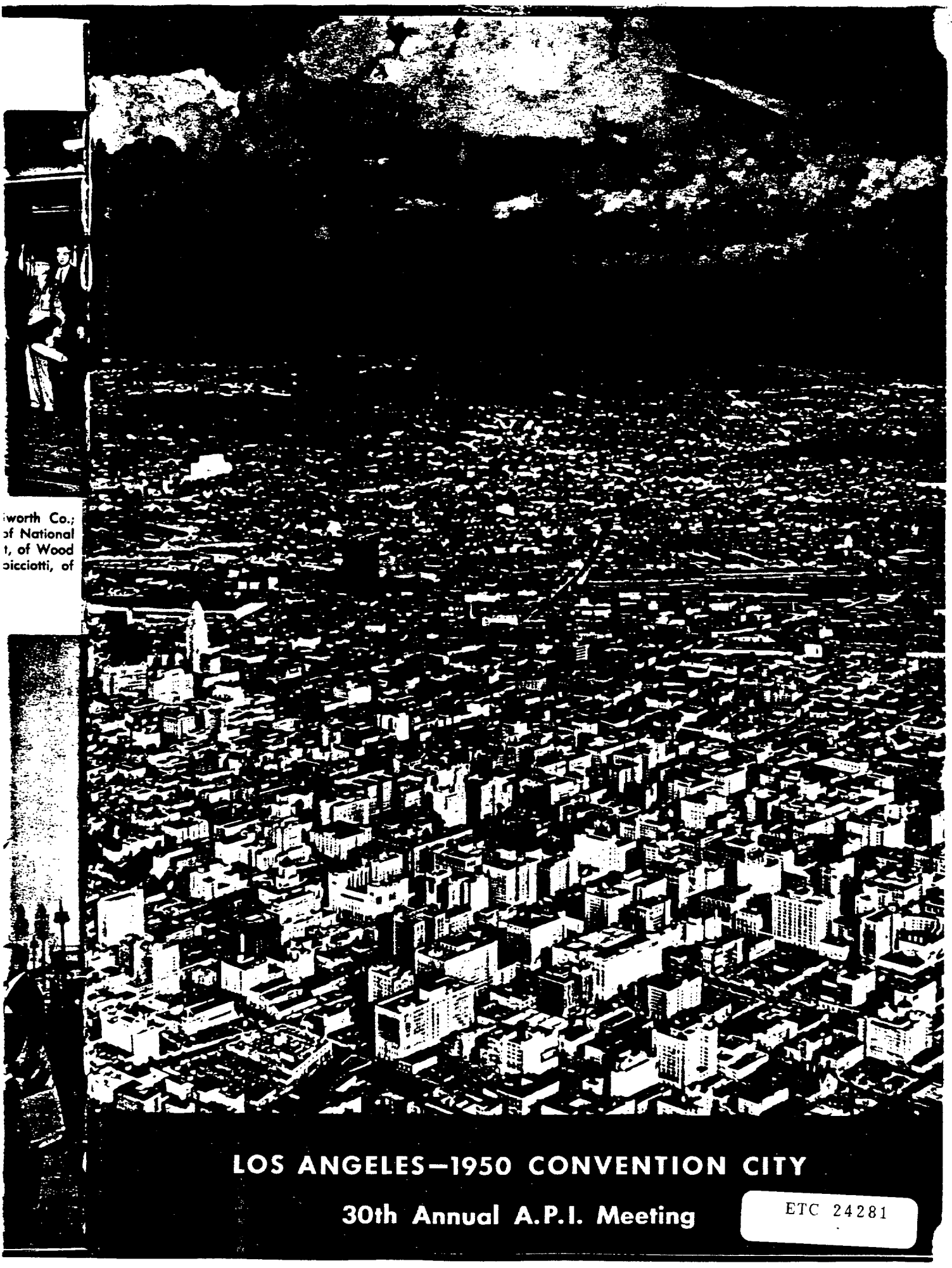

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LOS ANGELES—1950 CONVENTION CITY

30th Annual A.P.I. Meeting

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