

PLAINTIFFS
EXHIBIT
ETCO-120

CHARLES H. ZEANAH

ETC 29361

ETHYL NEWS INDEX-1960

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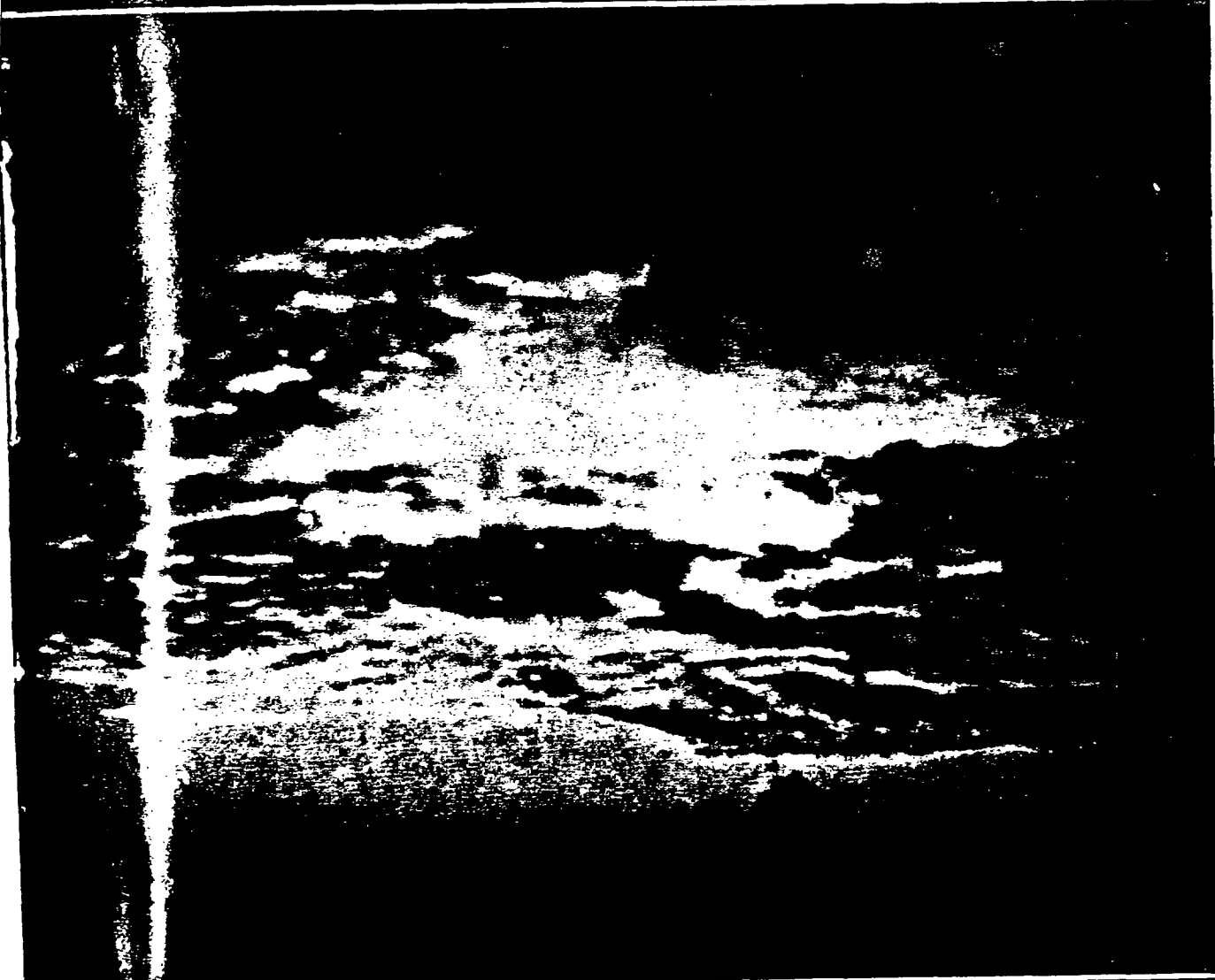
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ETHYL NEWS



In this issue:

A full-color cloud chart for predicting the weather

ETC 29364

ETHYL NEWS

JANUARY-FEBRUARY 1960



THE COVER photo is one of the more colorful of the 2,500 cloud pictures in the collection of Richmond (Va.) weather forecaster Louis D. Rubin. For more about Mr. Rubin's sky-high business and a copy of his cloud chart, see pages 11-14.

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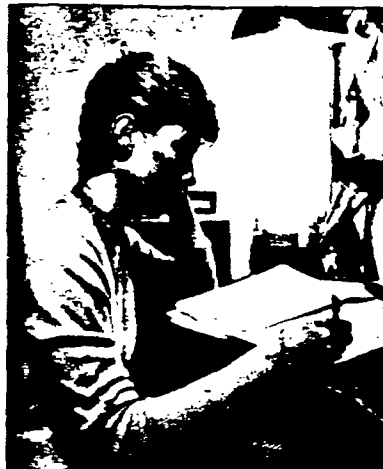
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ETC 29365



Reading, Writing and . . . Working

A business educator points out how schools and colleges can better
prepare students for successful careers in industry



By Theodore J. Carron*

*

As assistant director, Administration and Services, at Ethyl Corporation's Research Laboratories in Detroit, Mr. Carron is responsible for training activities, personnel functions, information services and safety. In the field of education, he is chairman of the Company's Fellowship and Scholarship Committee, a member of the Accreditation Committee of the Engineers' Council for Professional Development, the Advisory Committee on Education of the American Petroleum Institute's Committee on Public Affairs, and the American Society for Engineering Education. Mr. Carron has a BS in chemical engineering from the University of Detroit, and an MS in the same subject from the University of Michigan and has done advanced work in psychology. He has served in various capacities with the American Institute of Chemical Engineers, the American Chemical Society, the American Association for the Advancement of Science and the Engineering Society of Detroit.

IF THE NATION'S SCHOOLS and colleges are to provide qualified manpower to help business and industry meet the challenges of today and tomorrow, educators must emphasize and develop greater student abilities in reading and writing. No other skills are comparable in basic importance.

Educational institutions can serve the business world better by helping students overcome these and related shortcomings. But whatever deficiencies may exist in our schools, few if any of them can be eliminated without an extension of teamwork between parents, teachers and responsible citizens.

Companies everywhere find an astonishingly large proportion of their employees unable to read efficiently. Equally depressing numbers cannot express themselves in clear and concise English, either spoken or written. Such handicaps not only hinder the learning process in classrooms and during study hours, but prevent those with potentials from contributing fully to their employers' success and reaching achievement peaks in their career lifetimes.

The teaching of English demands far greater

READING, WRITING AND... WORKING

attention to composition. Most of our courses are overly concerned with form, grammar and spelling. Much greater emphasis should be put on communicative aspects of the language.

There is only one way for anyone to learn how to express himself clearly and concisely in writing. Students must write, write and then rewrite. It wouldn't be too much to require boys and girls to prepare one theme a week during each of their four years in high school.

Development Reading

On another aspect of communications, I suggest that educators consider a development reading program. It should be designed not to improve the mechanics of reading (that is remedial work), but to teach how the contents of books can be absorbed.

Somewhere along the line, students have to be taught how to read for ideas, not just feed back the mere words of a book. Pupils haven't learned how to read until they understand the author's thinking. Then they become not just parroting pupils, but bona fide students.

So when I refer to development reading programs, I am thinking of book discussion groups, which would provide supplementary ways for the rising generation to improve its abilities with the spoken language too. The cultivation of reading efficiency and a love for books, coupled with speaking dexterity, are essential in fundamental education.

In reading and writing, and in other subjects too, there is a tendency to teach leisurely until comparatively late years of schooling. Industry would like to see those with exceptional talents recognized and encouraged in every way at the elementary level, beginning as soon as promise is noted. Early action is imperative if manpower is to be used with maximum efficiency.

We should discover and properly educate not only embryonic scientists, but those with the best potentials for management, the professions, social studies, the humanities and other fields.

Another expectation of industry is to see higher and more uniform standards of achievement in our schools. In addition to a diploma, we would like to have available a transcript of courses taken and grades earned. And it would be helpful to see a

greater uniformity in measuring and reporting student performance.

Even if many educators give psychological reasons for the elimination of grades or the substitution of such general terms as "satisfactory" or "unsatisfactory," there is no experimental evidence to justify abandonment of competition as a motive for academic achievement. On the contrary: there is a great deal of evidence which indicates that competition with others, or against the student's past record, are highly effective forms of motivation.

There is ample data to show that learning cannot occur without some stress and discomfort. Although it is bad pedagogy to force an average child to compete with a genius or a moron, every youngster must be taught to realize that competition is a normal part of life, not only in school but during his future years in the workaday world.

Need Clear Thinkers

In encouraging students to preserve their individuality and independence of thought, educators have another big job to do. Business and industry need people who are able to think clearly and draw sound conclusions from the evidence before them.

Employers want young men and women who can distinguish fact from fancy, recognize propaganda, esteem what is worthwhile and discard the trivial, make ethical and moral judgments even when they are unpopular, and recognize truth when they see it.



"... book discussion groups provide ways to improve abilities with the spoken language."

In substance, they are asking the schools to teach children how to examine ideas critically, to develop independence of thought and to learn to stand alone when the crowd is wrong.

Regardless of whether the home should or should not delegate these and other responsibilities to the school, one of the first obligations of community-minded educators should be to enlist the cooperation of more parents and the extended support of business and industry.

I urge teachers to draw as many businessmen into their activities as possible. Encourage industrialists, executives and other leaders to run for school board positions and serve on committees

concerned with educational or related problems. Each of these men can become a salesman for school systems and work harder for teacher interests. Teachers and school administrators should never refuse opportunities to speak before key community groups.

In educating the public through improved adult classes, schools might give further thought to courses on such subjects as individual differences, child psychology and personality development. This long-range approach should help better relationships between parents, schools and the community.

Better Teacher Training

Higher standards of teacher preparation concern businessmen because employers ultimately benefit so much from those who are well taught. The curriculum of the teachers' college should be primarily a liberal arts program, supplemented by not more than six to eight hours of educational philosophy and psychology.

There is also a need for more effective on-the-job teacher training than at present. As teachers increase in professional stature, school administrators must be successful in arousing public support for higher teachers' salaries.

Improvement goals can be achieved more quickly, easily and advantageously if teachers and business leaders alike campaign vigorously to raise education to a higher place on our scale of values. #



"Teachers and school administrators should never refuse opportunities to speak before civic groups."



Plant tours by teachers on business-education days and other occasions promote mutual understanding that helps raise educational levels.



True to the BLUE a

Enthusiasm for national history sparks lively Civil War Round Tables

By Stanton P. Nickerson

"COULD THE CIVIL WAR have been avoided, and if so, how?"

As the centennial of the country's most tragic conflict approaches next year, provocative questions like this are being weighed and reviewed with increasing earnestness by thousands of people.

These amateur and professional historians belong to some 65 clubs scattered across the nation, known as Civil War Round Tables. Their members share a continuing excitement over all events, circumstances and key personalities related to the critical years of 1861-1865.

Lecture and discussion meetings are held monthly. Trips to battlefields and important sites associated with the times help Round Table members appreciate crucial events in the North-South struggle. Clubs work continuously to help preserve and maintain landmarks and shrines, and encourage more Americans to visit these locations.

Informal Beginnings

Originating in Chicago during the 1930's, the Round Table idea stemmed from informal gatherings in the Abraham Lincoln Book Shop, where patrons often lingered to discuss the war with each other and the shop's proprietor, Ralph Newman. In due course, informal luncheons were started,

evolving by 1940 into dinner meetings with speakers and audience-participation forums afterward.

As word spread about the society, membership increased rapidly, culminating in its incorporation as a non-profit group 16 years ago. Meanwhile, Civil War enthusiasts in other communities followed Chicago's example and established similar ones.

Membership Grows

Collectively, their estimated membership approaches 10,000, with the largest regional concentrations in the Middle West and in Atlantic seaboard cities. Three are outside the United States—in Canada, England, and another in Germany, organized among American occupation forces.

Representative topics considered at monthly meetings of the Chicago club indicate the nature and variety of papers presented. They have included "A Candid View of Grant," "The Loyalty Oath in the Civil War," "Spies for the Blue and Gray," "The Nature of Secession" and "Reporters for the Union."

The war's military milestones on land and at sea, and the careers of Union and Confederate officers are favorite themes for addresses and discussions. Typical subjects have been "Buell's March on Chattanooga," "The Prison at Andersonville," "Stormy Ben Butler" and "The Mobile Campaign."

Some Round Tables give awards for outstand-



Organization members enjoy analyses of major campaigns, battles and bravery like General Pickett's Confederate charge at Gettysburg.

E and GRAY

ing research on the war and for noteworthy writing or speaking. They also whet members' interests by distributing reprints of significant scholarly articles, and include subscriptions to historical journals in membership dues.

To help bring important addresses by authorities on the Civil War to more listeners, metropolitan Round Tables are making collections of recorded speeches, which can be borrowed by others.

The next few years are bound to see further expansion in the number and size of groups probing deeply into military, sociological and economic phases of the war.

Particular interest will be generated by the diversified commemorative program being planned for 1961-1965 by the national Civil War Centennial Commission, on which Round Table leaders are serving. The commission's chairman is Major General Ulysses S. Grant, 3rd, of the Washington club, a grandson of the Union's commander-in-chief. #



Above, grandsons of opposing generals who fought at Vicksburg, Miss., in 1863 meet at the battlefield's monument: John C. Pemberton, 3rd., left, and Major General Ulysses S. Grant, 3rd. . . . Below left, historic sites such as Lookout Mountain at Chattanooga, Tenn., draw many Round Table visitors.



Big Lift for Skiers

It's easy to reach trail and slope
summits by mechanical devices installed at
popular winter sports areas

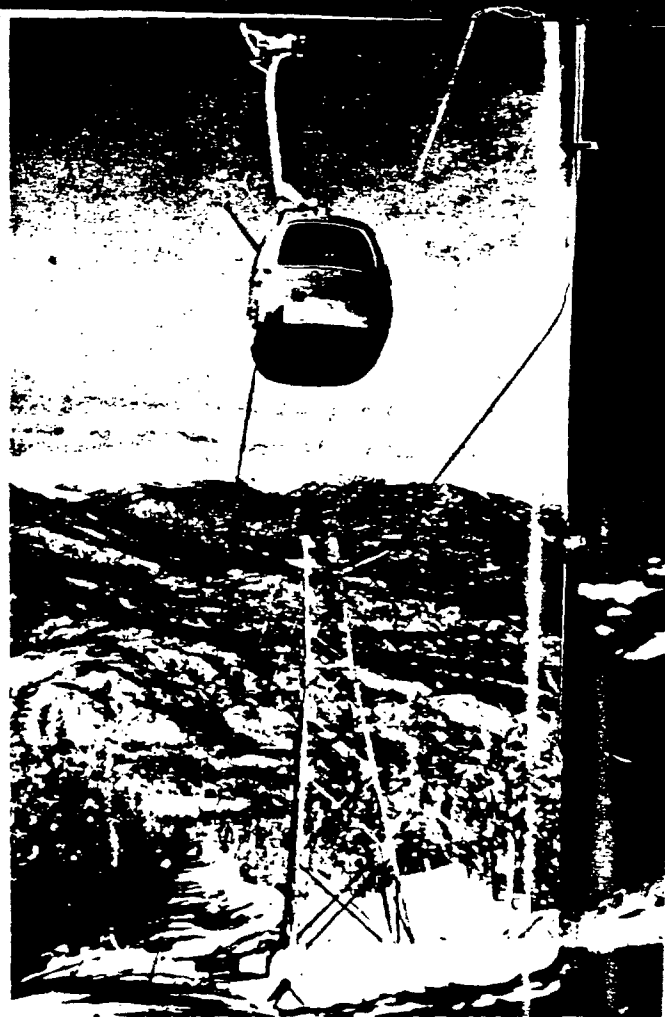
THERE'S NO GREATER THRILL for thousands of winter sports fans than swooshing downhill on skis, meeting the challenges of dips and turns and arriving breathlessly at the foot of a slope.

The most ardent skier's enthusiasm, however, would melt like a drift in the spring if he had to toil upward on foot to reach the top of a favorite run. Until comparatively recent years, more time and energy were spent in climbing than in the excitement of racing downhill.

But as old and young are aware, this discouraging prospect is now in the same class as the horse and buggy. The widespread use of often ingenious means for hauling skiers aloft mechanically has become as common and necessary as powdered snow for a resort's popularity.

Driven by diesel or gasoline engines or electric motors, lifts and tows are on the go throughout the winter. Some, in areas such as the White Mountains and the Rockies, operate the year round, carrying shirtsleeve sightseers in warmer months.

Typical devices for ski "climbing" in various parts of the country are shown on these pages. With more and more motorists discovering that skiing is another form of fun to be found in their "Magic Circle," these and hundreds of other tows and lifts are carrying added thousands of passengers. #



Wildcat Mountain in New Hampshire's Presidential range is 4,420 feet high, but this mile-long gondola lift line, operating the year round, whisks riders to the mountain top in only 10 minutes.

A rugged Sno-Cat is the taxi for winter sports fans wanting to try Hell Roaring slope down Big Mountain in the Rockies of western Montana.





A twin-chair lift carries 480 skiers hourly to slopes for experts at Berthoud Pass on the Continental Divide some 50 miles west of Denver.



Snow-crested peaks and a mountain-top warming hut await skiers carried up steep slopes in this tank-like weasel in Washington's Mt. Baker National Forest.



Above, in Vermont as in many other areas, skiers of all ages still use simple rope tows, a New England innovation . . . Below, a skier at a winter resort area in Michigan, about to climb aboard a pomalift, which has a saddle-like seat.



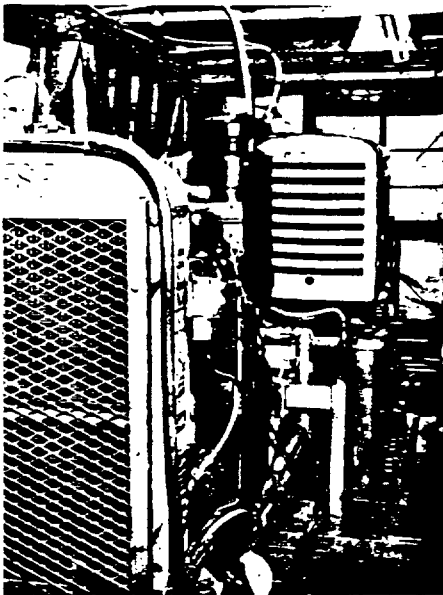
In the Adirondack Mountains of New York, winter sports enthusiasts at Snow Ridge use this T-bar lift to ride in pairs or singly.



BIG LIFT FOR SKIERS



Without lifts, expert skiers like this one at Sun Valley, Idaho, would spend far more time climbing than in zooming downhill.



Although seldom seen by winter sports fans, diesel and gasoline engines, such as these at California's Mount Baldy, supply needed power to ski lifts.



Designed to carry groups, the unique Ski-moblie's cars-in-tandem serve a snowy slope in North Conway, N. H., in the White Mountains.



J-bar lifts are among the many new facilities at skiing centers in the Green Mountains of Vermont.

In company with most winter resort areas, Bogus Basin, Idaho, provides ample parking space. It also has four lifts with a total capacity of 2,200 people per hour.



By Rail, Road and Water

Modern, efficient services and facilities
assure refiners of on-time delivery
of "Ethyl" antiknock compounds

THERE WAS A REAL NOTE of urgency in the refiner's voice.

Emergency shutdown of the reformer had sharply increased tetraethyl lead requirements for blending finished gasoline. Consequently, more antiknock compound was needed—and soon.

Within a few hours after the hurry-up call, a tank car of "Ethyl" fluid was on the way. The next day, a switch engine shunted it on to the refinery siding. Soon, its contents were being unloaded into the mixing plant weigh tank.

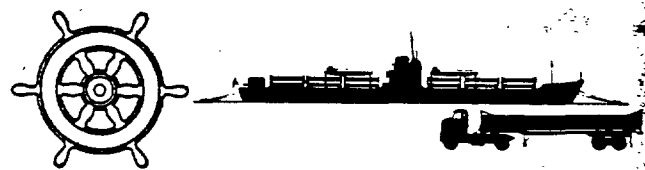
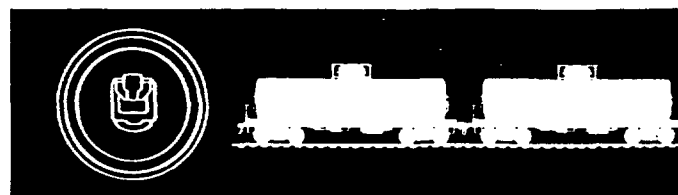
Little more than 24 hours had elapsed between the time of the urgent call and the delivery of the antiknock compound to the refinery.

Cases like this may be unusual, but when they do arise, customer oil companies everywhere have come to know they can rely on Ethyl Corporation's dependable distribution system for on-time emergency service as well as for routine deliveries.

Outstanding System

Improved and expanded over the years to keep pace with increasing requirements for "Ethyl" antiknock compounds and the Company's growing list of other products, the system is one of the most outstanding in the chemical industry. In serving refiners in the United States, Canada, Mexico and overseas, it embraces railroad, tank truck, steamship and—on a few occasions—air transportation.

So far-reaching and flexible is the Ethyl delivery system that there are few if any refiners in the United States that can't be supplied within two days.



Shipping points where large inventories of "Ethyl" antiknock compounds are maintained are strategically located throughout the country. Besides the Company's manufacturing plants at Baton Rouge, La., Houston, Texas, and Pittsburg, Calif., they include storage terminals at Edge Moor, Del., and Wilmington, Calif.

North of the border, Ethyl Corporation of Canada Limited ships directly from its conveniently situated manufacturing plant at Sarnia, Ont. Opening of the plant in 1956 reduced rail shipping time to more distant refinery locations as much as a full week compared to previous schedules from manufacturing facilities in the United States. A minimum of two days was saved to every Canadian refinery.

To further increase the availability of its principal product to refiners in the U. S., Ethyl Corporation maintains loaded tank cars on 34 leased rail sidings

BY RAIL, ROAD AND WATER

near important refining centers across the country. From any of these locations and from plants and terminals, cars can be dispatched on short notice.

Total capacity of Ethyl's fleet of specially designed antiknock compound railroad tank cars is tremendous—and still growing. At a given moment, the 700 cars can hold 48 million pounds of fluid.

The Company currently has on order—for delivery the first part of this year—46 more tank cars. They will bring the total number of 3,000-gallon cars to 251. The antiknock compound delivery fleet also includes 457 6,000-gallon and 38 9,000-gallon tank cars.

In addition, Ethyl uses tank cars for the shipment of sodium, ethyl chloride and vinyl chloride monomer to customers across the country.

With so many well-located shipping points, the Ethyl tank cars can turn around fast under peak season conditions and further increase the Company's delivery capacity.

Where rail facilities are lacking or where refinery equipment makes it more practical, "Ethyl" fluid is

delivered in over-the-road tank trucks. Highway delivery is available from the Company's manufacturing plants and storage terminals. In addition, Ethyl has a transfer terminal at Everett, Wash., for transferring fluid from tank cars to permit special deliveries by tank truck in that area.

A recent addition to the tank truck fleet in Texas is a new semi-trailer with a capacity of 3,350 gallons—larger than any of Ethyl's other truck units.

A pioneer in the development and improvement of shipping containers for antiknock compounds, Ethyl in 1958 introduced new 2,200-gallon tanks for deliveries to customers overseas. Now in regular use, these tanks are transported by truck-trailer to dockside, and hoisted aboard ship by gantry cranes. At the port of destination, they are lifted from the ship and put on another truck-trailer for highway delivery to the refinery.

Each of the specially-designed tanks holds the equivalent of 40 standard 55-gallon drums of antiknock compound. Tanks can be emptied in about one-fourth the time required for 40 drums. Their use also saves a substantial amount of handling time in transit.

Shipment and delivery of Ethyl products is handled by experienced Order and Shipping and Traffic personnel. They have at their disposal modern and efficient communications equipment, including the Company's far-reaching teletype system.

Complete Records Kept

Complete detailed records of every shipment are maintained. On short notice, the location of the units in the delivery fleet can be pinpointed.

This information is especially valuable in answering urgent calls for emergency deliveries. Often it is possible to intercept tank cars en route and divert them to other-than-original destinations. At the same time, because the Company has so many cars on the move and spotted throughout the country, the original consignee receives a shipment without delay.

As Ethyl continues to supply antiknock compounds to refiners throughout the world, it continues, too, to make further improvements in its delivery services and facilities. Among the projects on which the Company is currently working is the extension of its new and better sea-land service to customers in areas where deliveries depend on over-water shipments. #



Largest units in Ethyl's 700-car railroad fleet are these 9,000-gallon tank cars. Total capacity of the fleet is 48 million gallons.

Look at that Sky!

Business, industry, education and government are following that advice and are using this retired contractor's cloud charts to learn about the weather

EVEN AT THE RISK of disproving the well-known remark attributed to Mark Twain, Louis D. Rubin, of Richmond, Va., has done something about the weather.

A retired electrical contractor, Mr. Rubin has been studying the weather and phenomena connected with it for some 25 years. His somewhat unorthodox but interesting and accurate observations and forecasting methods are becoming widely circulated.

Mr. Rubin's most unique and popular weather project is the full-color cloud chart reproduced on

the next two pages. The chart and an abbreviated version, in the form of a 12-page booklet, have been widely distributed.

He is currently working on an easy-to-understand, 50,000-word, color-illustrated book in which several publishers have expressed interest. Frequently, he is consulted and quoted by newspapers, wire services and radio and television stations in Richmond and other parts of the country.

Simplicity is the key to Mr. Rubin's system of teaching and applying weather forecasting by the cloud chart. By comparing actual cloud formations in the sky with the 35 colored pictures reproduced on the chart, youngsters and completely untrained laymen can predict coming weather with a remarkable degree of accuracy. Use of the chart and an explanation of what causes common weather conditions are explained in the text and captions that appear on the chart. They describe types of clouds, tell how they form, what causes rain, and explain how clouds foretell the weather.

Weather Maps Help Little

"Barometers are interesting," says weatherman Rubin, who has several different types in the office-study of his Richmond home. "But the readings are meaningless unless you know when the mercury started to rise or fall and how fast the movement has been.

"Newspaper weather maps may help a little, but when you see them they are 20 or more hours old. Cold and warm fronts can move as much as 600 miles in 24 hours. Most maps show yesterday's weather.

(Continued on page 14)



Interested in meteorology for 25 years, Louis D. Rubin, of Richmond, Va., simplifies weather studies by publishing easily-understood cloud charts.

The full-color cloud chart on the next two pages may be removed and saved for use in predicting the weather.

CLOUDS FORETELL the WEATHER THAT WINDS BRING

A change in the weather seldom comes as a surprise to those who know the meaning of nature's warning signs. Constant study of cloud formations, winds and their directions will enable you to predict your local weather with reasonable accuracy if you know what to look for and how to read the signs correctly. A barometer is helpful in interpreting these signs, but only when its dial wording is ignored and attention is confined to the rapidity or slowness of the rise and fall, and time to change.

Newspaper weather maps are of little help, since weather fronts move about 500 miles every 24 hours and newspaper maps usually appear 24 hours later. Thus you are looking at "today's map," but "yesterday's weather."

HOW CLOUDS FORM

Reduced to simplest terms, weather is determined by the amount of water in the air, while the form in which it exists indicates the trend of development. In general, the atmosphere always contains water in the form of invisible water vapor. However, if the amount of water vapor in the air is increased to the extent that the air becomes saturated at the prevailing temperature, then part of the water vapor condenses to tiny droplets of water, which immediately become visible in the form of cloud or fog. This is simply a cloud reaching the ground level.

Under certain conditions the water droplets in clouds combine to form larger drops, which fall to the earth in the form of rain, sleet, hail or snow, depending on the temperature of the air.

WHAT CAUSES RAIN

Although there are many conditions which result in rain or some form of precipitation, the basic cause remains the same. This is when warm tropical air rises and collides with falling cold polar air.

There are usually more showers in mountainous regions because warm air holds more water than cold air and a wind blowing moist air against a range of mountains causes rain on the windward side, and clear weather on the lee side. The warm moist air is forced upwards by the barrier of mountains and as it rises it becomes cooler and more saturated until it can no longer hold the water content. Then rain occurs leaving the air warmer as it moves down the lee side of the mountains.

TYPES OF CLOUDS

Weather changes are pictured by constantly changing cloud formations, usually in a sequence from high to low cloud formations. For easy reference, cloud formations are classified into four basic types or families:

The prefix **CIRRO** or **CIRRUS** denotes high clouds. These are called ice clouds and occur at altitudes ranging from 20,000 to 40,000 feet.

The prefix **ALTO** denotes middle clouds ranging from 8,500 to 20,000 feet.

Other prefixes denote the low clouds having vertical development from surface up to 8,500 feet.

Clouds termed **CUMULUS** appear as "a heap" (the "wool pack" cloud is typical) and **STRATUS** as "a layer."

There are three important factors in forecasting local weather:

- (1) the sequence of cloud formations
- (2) their direction and
- (3) wind direction.

This is so since weather is often associated with warm or cold fronts. By cloud changes slow moving warm fronts give several days' warning of pending rain of long duration. Rapidly moving cold fronts bring showers of short duration.

Predominating clouds in a formation determine code number and classification. The caption forecasts appearing below are based on surface wind directions.

CLOUD

THIS CHART HAS BEEN PREPARED TO HELP YOU IN THE U.S.



H1—CIRRUS fibratus

Ice clouds. Good weather if winds from W NW to N. Precipitation likely within 20 to 30 hours if winds steady from NE E to S.



H2—CIRRUS spissatus

Ice clouds. Good weather if winds from W NW to N. Precipitation likely within 20 to 30 hours if winds steady from NE E to S.



H4—CIRRUS uncinus spreading over sky

High ice clouds. Good weather if winds from W NW to N. Precipitation likely within 20 to 30 hours if winds steady from NE E to S.



H6—CIR

High ice W NW to N. Precipitation likely within 20 to 30 hours if winds steady from NE E to S.



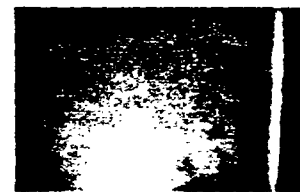
H9—CIRROCUMULUS

Ice clouds. Precipitation likely 15-20 hours if wind NE to S. Early summer A.M., often afternoon thunder showers. Other winds, overcast.



H9—CIRROCUMULUS

Ice clouds. Precipitation likely 15-20 hours if wind NE to S. Early summer A.M., often afternoon thunder showers. Other winds, overcast.



H7—CIRROSTRATUS with halo

Precipitation likely within 15 to 24 hours if wind steady from NE to S. Prismatic effect: sun or moon through ice crystals causes halo.



M1—A

Precipitation likely within 15 to 24 hours if wind steady from NE to S. Prismatic effect: sun or moon through ice crystals causes halo.



M2—ALTOSTRATUS translucidus

Precipitation likely in 10 to 15 hours if winds steady NE to S. Sun appears to be behind frosted glass. Other winds bring overcast sky.



M1—ALTOSTRATUS translucidus

Precipitation likely in 10 to 15 hours if winds steady NE to S. Sun appears to be behind frosted glass. Other winds bring overcast sky.



L1—CUMULUS humilis

Fair weather clouds if they show no vertical development. Can build up and develop into cumulus congestus or cumulonimbus clouds.



L2—C

Fair weather clouds if they show no vertical development. Can build up and develop into cumulus congestus or cumulonimbus clouds.



L9—CUMULONIMBUS

Precipitation likely and soon coming usually from SW W to N. Distant clouds often show an anvil-shaped cirroform cap.



L9—CUMULONIMBUS capillatus

Precipitation likely and soon coming usually from SW W to N. Distant clouds often show an anvil-shaped cirroform cap.



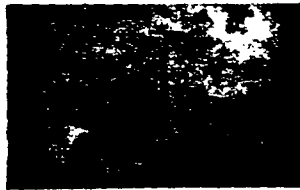
L3—CUMULONIMBUS calvus

Precipitation likely and soon coming usually from SW W to N. Distant clouds often show an anvil-shaped cirroform cap.



L5—ST

Precipitation likely and soon coming usually from SW W to N. Distant clouds often show an anvil-shaped cirroform cap.



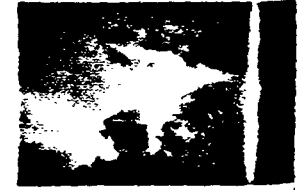
L9—NIMBOSTRATUS

Rain or snow clouds. Precipitation of long duration if winds NE to S, or shorter duration if winds are from SW W to N.



L9—NIMBOSTRATUS

Rain or snow clouds. Precipitation of long duration if winds NE to S, or shorter duration if winds are from SW W to N.



L2—CUMULUS congestus with Stratus fractus of bad weather

Precipitation of long duration if winds NE to S, or shorter duration with other winds.



L7—

Fair weather clouds if they show no vertical development. Can build up and develop into cumulus congestus or cumulonimbus clouds.

LOUD CHART

EPARED TO, LID IN THE INTERPRETATION OF CLOUD REPORTS IN THE INTERNATIONAL FIGURE CODE

Below the equator the prevailing winds are generally opposite the winds above the equator. With this adjustment made forecasts will be as noted below.



1
Clear sky



4
HI—CIRRUS above 45°
High ice clouds. Good weather if winds from W NW to N. Precipitation likely within 20 to 30 hours if winds steady from NE E to S.



5
HI—CIRROSTRATUS covering sky
Precipitation likely within 15 to 25 hours if winds steady from NE E to S, or sooner if winds SE to S. Other winds bring overcast sky.



6
HI—CIRROSTRATUS covering sky
Ice clouds cover sky. Precipitation likely within 15 to 25 hours if winds steady from NE E to S. Other winds bring overcast sky.



7
HI—CIRROCUMULUS
Ice clouds. Precipitation likely 15-20 hours if wind NE to S. Early summer A.M., often afternoon thunder showers. Other winds, overcast.



11
hours effect of sea haze



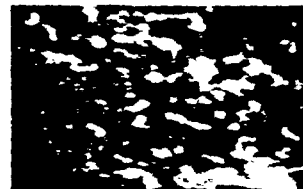
11
MI—ALTOSTRATUS translucent
Precipitation likely within 10 to 20 hours if wind is steady from NE to S. Sun appears as behind frosted glass. Other winds, overcast sky.



12
MI—ALTOSTRATUS translucent
Water and ice clouds. Some precipitation likely within 15 to 20 hours if wind is steady NE to S. Other winds bring overcast sky.



13
MI—ALTOSTRATUS undulatus
Precipitation likely within 15 to 20 hours if wind is steady NE to S. Other winds bring overcast sky—mostly threaten precipitation.



14
MI—ALTOSTRATUS perlucidus
Water and ice clouds. Some precipitation likely within 15 to 20 hours if wind steady from NE to S. Other winds bring overcast sky.



15
vertical growth clouds



15
L2—CUMULUS with vertical growth
Fair weather clouds building up vertically often indicate cumulus congestus and cumulonimbus which bring afternoon showers.



19
L2—CUMULUS congestus
If clouds form from SW to NW precipitation with gusty winds and thunderstorms or only wind squalls are likely within 5 to 10 hours.



20
L2—CUMULUS congestus
Cloud tops forming altostratus cumulonimbus usually bring precipitation in 5-10 hours, gusty winds, thunder showers, wind squalls.



21
L2—CUMULUS congestus
If clouds form from SW to NW precipitation with gusty winds and thunderstorms or only wind squalls is likely within 5 to 10 hours.



25
sudden shower



25
L3—STRATOCUMULUS stratiformis
Immediate threatener of bad weather from a sprinkle to heavy precipitation. If at head of cold front, gusty winds or thunder shower.



26
L3—STRATOCUMULUS opacus
Immediate threatener of bad weather from a sprinkle to heavy precipitation. If at head of cold front, gusty winds or thunder shower.



27
L6—STRATUS (Note tower fading in cloud)
Winds from NE to S may bring heavy precipitation. Other winds bring only light drizzle or an overcast sky.



28
L9—CUMULONIMBUS mamma
Seldom seen low to middle clouds. Associated with severe wind squalls, hail, heavy precipitation, tornadoes and thunderstorms.



32
Low to middle water clouds with gold, pink, amber, lavender or rosy background. No precipitation unless winds steady NE to S, then cumulus fractus of bad weather.



32
L1—CUMULUS fractus
Fair weather clouds broken up by strong winds. No precipitation unless winds steady NE to S, then cumulus fractus of bad weather.



33
L3—STRATOCUMULUS at sunset
Low water clouds of dark Indian red color. Precipitation in 12 to 20 hours if winds from NE to S. Other winds bring overcast sky.



34
M5—ALTOSTRATUS and **CIRRUS** at sunset
Middle water to ice clouds with brilliant white background. Precipitation likely within 20 to 24 hours if winds are from NE E to S.



35
L3—STRATOCUMULUS at sunset
Low to middle water clouds with gold, pink, amber, lavender or rosy background. No precipitation likely within 20 to 24 hours.

ETC 29378

LOOK AT THAT SKY!

"Weather changes are heralded well in advance," Mr. Rubin points out. "All you have to do is study the clouds and you will know what's coming." He has published his cloud charts to simplify this study.

Apparently more conventional weathermen and meteorologists agree with Rubin's methods and publications. His cloud chart, refined and improved over the last nine years, has been approved by the United States Weather Bureau and the weather bureaus of Great Britain, Australia and New Zealand. It is used by over 1,100 schools and colleges, the aeronautical commissions of at least seven states, and the armed forces. It is employed by the Boy and Girl Scouts and Campfire Girls and has been reproduced in a science textbook.

Greatest distribution of the 35-picture cloud chart and the abbreviated 12-page booklet containing 16 representative colored cloud pictures has been by business concerns. Banks, insurance companies, advertising agencies, chemical manufacturers, farm suppliers, and other firms in the United States, Canada, Australia, New Zealand and Great Britain have used them.

Sales Promotion Pieces

Recognizing the verity of the first part of the Mark Twain statement that "Everybody talks about the weather," these companies have bought the booklets and charts by the thousands. They have them imprinted with their name, trade mark and a brief advertising message and use them as hand-out or mailing sales promotion pieces.

Total circulation of Rubin cloud-picture, weather-forecasting publications by business, industry, government agencies and youth organizations is several million.

Weather interests now provide both therapy and income for the 64-year-old Louis D. Rubin, but they started quite by accident. Confined to a hospital during an extended illness a number of years ago, Mr. Rubin became fascinated by the cloud formations that drifted by his bedside window. As his confinement lengthened into weeks and then months, he began to notice the distinct correlation between cloud formations and following weather.

Subsequent study and extensive picture-taking led to the cloud pictures, the booklets and then the cloud charts.

Since they have become so widely used, Mr. Rubin reflects with a shudder on the time, a number of years ago, when he almost sold his novel idea and picture file for a mere \$200.

Now he has some 2,500 color slides he has taken himself, not only of representative and significant cloud formations but also of freak and especially colorful sky patterns. From these, he selects the best for his publications.

Such an intense interest in the weather has led Mr. Rubin to probe deeper than forecasting.

Studies Natural Phenomena

One of his chief interests is causes for the weather conditions and other fundamental natural phenomena that occur from time to time. Almost ten years ago, he gained widespread publicity when he advanced a theory that cold fronts are caused by volcanic eruptions.

"Volcanic ash thrown into the atmosphere forms a protective shield against the sun, cooling air currents below," he explains. Developed in 1950, the theory has been correct 92 percent of the time, its originator claims.

Now, Mr. Rubin has an even more fundamental theory—an explanation for the volcanic eruptions. In this case, it's sunspots.

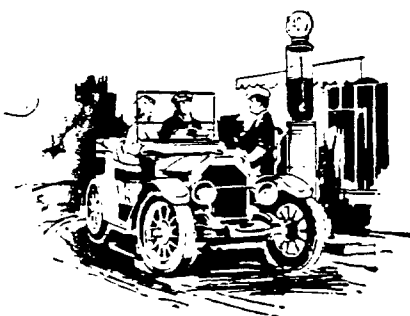
When there is heavy sunspot activity—violent eruptions on the sun's surface—the earth will have volcanic eruptions within 15 to 17 days and earthquakes in less than a month, he holds.

Although he has been reading meteorological books for more than 20 years, the Richmond weatherman makes no claim to be a scientific expert, but he is willing to stake his considerable reputation on his interesting theories. Admittedly intuition and even a little guesswork have gone into the formulation of some of his theories, but their repeated confirmation by actual occurrences have convinced Mr. Rubin of their accuracy.

Meanwhile, there's no guesswork about the practical application of his cloud chart and booklet. With so many copies in use throughout the world and new orders coming in all the time, he's done something about the weather that apparently has captured the imagination of businessmen, government officials, educators, and laymen.

Now when "everybody talks about the weather," lots of them will know a little more what they're talking about. #

A Colorful Business



**Ethyl supplements its dye sales
with laboratory facilities,
technical data and the know-how
of product service engineers**

IN SHARP CONTRAST to several decades ago when most gasoline was refined for water-white clarity, petroleum products for quite a few years have been tinted with almost every color of the rainbow. Gasolines, diesel fuels, greases, lubricating oils and stove oils are brightly colored to increase their sales appeal and give them a distinctive appearance.

In recent years, new emphasis has been given to unusual colors to identify and advertise products of individual refiners. Such identification has become more important because of the number of products and grades, and complex distribution systems.

In coloring their products, refiners use special dyes in various forms.

As a leading supplier of chemical additives to oil companies, Ethyl Corporation markets a full line of high-quality oil soluble dyes to meet all

A COLORFUL BUSINESS

refinery color requirements. Concurrently, it provides technical data, the services and know-how of experienced product service engineers, and the facilities of a complete dye laboratory to assist refiners in the efficient use of these dyes.

Ethyl has been engaged in oil soluble dye research since 1923. That was the year "Ethyl" antiknock compound was introduced and leaded gasoline was colored by dye contained in the additive.

Over the intervening years, the Company has made many contributions to the improvement of dyes and dye handling equipment. It has developed color test methods and has cooperated with government agencies and manufacturers in solving problems related to gasoline color.



Ethyl's dyes, which have been refined and improved continuously, are now available in four different reds, and in orange, bronze, yellow and blue. Red, yellow and blue are primary dyes from which a wide range of clear hues can be formulated. Orange is also sometimes considered a basic color. It is brighter than a mixture of red and yellow dyes. Within the orange-red range it offers an economic advantage.

Three of Ethyl's red dyes, and its orange, yellow, bronze and blue are available as powders; one of the reds and the orange, bronze, yellow and blue come as liquids; two reds are sold in granular form; one red and the blue are available in beaded form; and the orange and yellow are marketed as flakes.

Each of the different forms has advantages under certain conditions. Powder dyes, for example, are

especially desirable where mixing equipment or time is limited. Granular forms are practically dust-free and remain free-flowing under even the most adverse temperature and humidity conditions. Flake and beaded dyes eliminate the dust problem entirely, and, since they are dense, reduce storage requirements.

In liquid form, dyes offer a continuous method of injection in blending procedures, but they are heavier and bulkier, since they come in mixtures of about 25 weight percent dye and 75 weight percent hydrocarbon carrier.

In coloring gasolines, refiners are, of course, aware of the dye content of the antiknock compounds which they also add to gasoline. This coloring is in accordance with recommendations of the United States Public Health Service that all gasoline containing tetraethyl lead be distinctively colored.

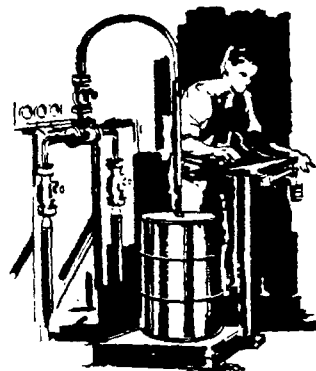
Usually the refiner adds more dye for market identification purposes. On the average, a total concentration of between one-half and two grams per 100 gallons is used.

Added through Tank Hatches

In early methods of adding dye to gasoline, the correct amount of dry dye or a slurry was added through tank gage hatches. It was circulated or the product agitated until uniform color was obtained.

The shortcomings of this method—time consumed and exposure to dye dust—spurred efforts to improve dye handling methods and equipment.

Dye pot installations were a subsequent development and are still widely used. In a typical in-





stallation, dye is weighed and placed in a pot in dry or slurry form. Product is circulated through the pot to transfer dye to the blending tank. The product blending tank is mixed during the circulating operation until uniform product color is obtained.

Dye pots also are used to formulate concentrated dye solutions. These concentrates can be stored and used to color products as required.

The development of dry dye eduction, a method that has several advantages, has been pioneered and improved by Ethyl Corporation through the years. When this procedure is used: (1) dye is not handled in the open; (2) weighing is simplified; (3) dye addition time is reduced; and (4) house-keeping is improved.

Vacuum Line Used

In dry dye eduction, the original shipping container of dye is placed on a platform scale and a vacuum line inserted in a hole in the drum head. A predetermined amount of dye is easily drawn into the product by vacuum supplied by an eductor installed in a by-pass of the product circulating system. Under good conditions, as much as 100 pounds of dye can be transferred in three to ten minutes.

In using Ethyl's oil soluble dyes, refiners have found that they meet rigid requirements for hue and intensity, solubility, rate and ease of solution, stability in finished gasoline, physical properties, and chemical composition. All these standards are important to produce desired results and at the same time eliminate delays or problems in dye operations.

Besides working to improve dyes, dye mixing equipment and procedures, and providing technical service and laboratory assistance to refiners with special dye problems, Ethyl Corporation has recently published an informative booklet on the subject. Entitled "Ethyl Oil Soluble Dyes," the booklet gives basic color and dye information, describes the various dyes supplied by the Company, explains color requirements for different types of gasoline, and covers dye handling procedures.

Copies Available

Copies may be obtained by refinery personnel immediately concerned with the supervision of dye operations through Ethyl Corporation, Ethyl Corporation of Canada and Ethyl USA representatives and offices. #

A COLOR GLOSSARY

Here are definitions of terms frequently used in discussing the color of petroleum dyes and the color of dyed petroleum products:

COLOR of dye refers to the color produced in the product when dye is used in recommended concentration.

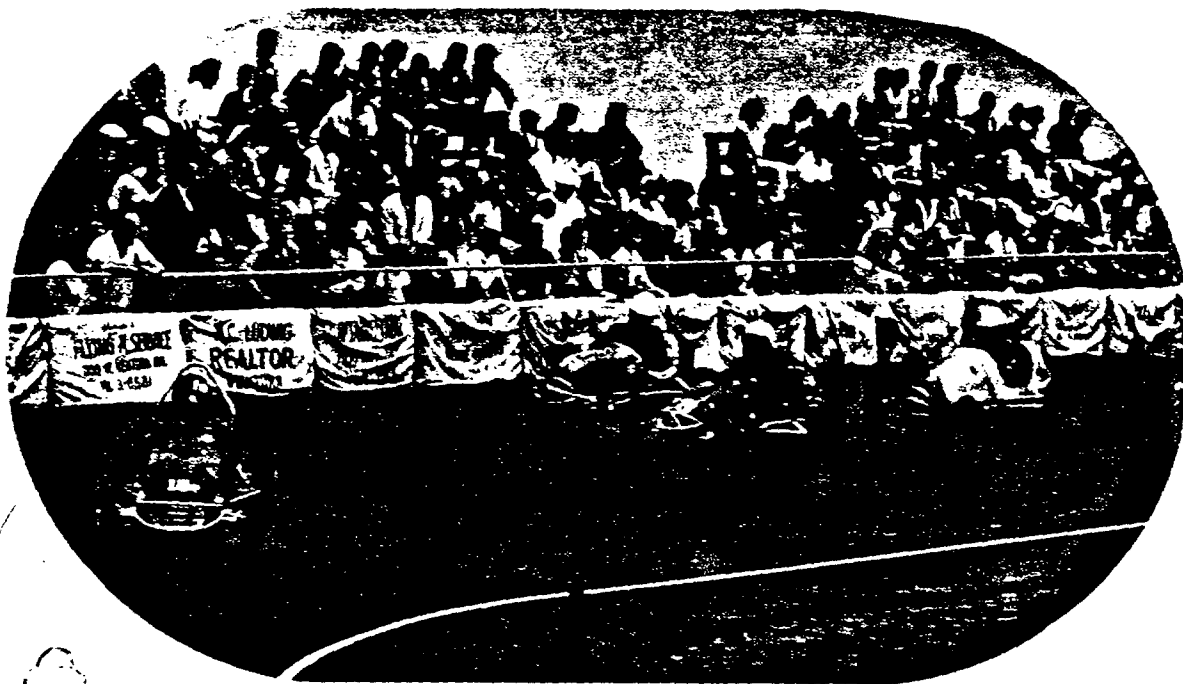
HUE is the attribute of color which determines whether a color is red, yellow, blue, green, etc. *Hue* is independent of *intensity* and *brightness*.

COLOR INTENSITY of a dye is often stated as the amount of dye necessary to produce a standard color intensity in gasoline.

INTENSITY is the quality of a color which increases or decreases with dye concentration. Intensity usually is stated as the relative color intensity of a dye in gasoline compared to color intensity of a standard reference dye at the same concentration.

METAMERIC COLORS are colors which match under one set of conditions but not under another, i.e., natural light as opposed to artificial light.

SOLVENT EFFECT is the different colors produced by a measured amount of the same dye in different solvents.



The oil and automotive industries are helping youngsters develop good driving and sportsmanship habits by encouraging these . . .

Tom Thumbs of the Race Track

By Jack B. Kemmerer

THE CROWD SHOUTED its acclaim as the racing cars spun around the track in a last desperate bid to win the wave of the checkered flag. Engines roared at full throttle as drivers jockeyed to squeeze through openings and take the lead.

When the race ended, six-year-old "Leadfoot" Danny caught the winner's flag and circled the track in true championship style. Pulling up in front of the grandstand to the blare of loudspeakers and cheers of the spectators, Danny sat in bashful silence as a pretty little girl bestowed the traditional victor's kiss.

Exciting contests like this are typical of races featuring one-quarter midgets, the latest addition to the family of less than standard-size cars. Once the so-called midget was the smallest; then the three-quarters midget appeared. But now the truly Lilliputian quarter midget is the most popular.

The tiny cars are much too compact to hold an adult; there is only room for youngsters to fit behind steering wheels. But in spite of their ages, drivers have their own racing organizations which

anyone may join, provided he is at least four years old and not more than 16. The All American Quarter Midget Racing Association's national headquarters are in Pittsburgh, Pa.

The lively little cars race on their own kind of tracks—ovals one-twentieth of a mile around, with hard packed earth or asphalt surfaces. Between 1,800 and 2,000 of them are in operation in various parts of the country, with an estimated 70,000 racers competing for prizes. More tracks are springing up continuously.

Los Angeles is the birthplace of this accelerating sport. After getting off to a slow start in the 1930's, it gained momentum with better planning and organization, improved facilities and more attention to driver education, including emphasis on safety. Support by parents, youth groups and civic organizations helped spark quarter midget racing into prominence within the past decade.



A push starts the little cars easily and quickly. They have direct drives and one-wheel brakes.



Miniature pumps at quarter midget race tracks supply the modest gasoline requirements of the contestants' Lilliputian vehicles.

Oil and automotive industry backing is giving the sport additional mileage with such incentives as trophies and even college scholarships. Representatives of these industries, including some from Ethyl Corporation, serve on technical committees for setting up rigid engine specifications, so that cars from all tracks can compete on equal terms.

Learn Proper Car Handling

"We're behind quarter midget racing all the way," an official from a West Coast oil company said recently. "The big thing is driver education. These boys and girls learn the most important things about handling any car properly—how to apply brakes, the use of throttles and how to control a skid. I wish the average adult driver knew half as much."

The little cars are powered by stock factory engines, usually Continentals. In the novice class, no engine can be changed. For "B" modified races, certain alterations are permitted, and in "A" modified, unlimited changes can be made to increase speed and power. All cars in every class must use the same gasoline available to adult motorists—either regular or premium.

Track dimensions limit excessive speeds and therefore reduce hazards. In such small ovals,

TOM THUMBS OF THE RACE TRACK



Removable plastic bodies simplify engine tune-ups before races start. This four-year-old veteran is learning from his father how to do both jobs.



New contestants find track officials informal and friendly during pre-race preliminaries. This lad is answering questions for an official starter.

straightaways average only about 68 feet. This means that quarter midgets seldom exceed 24 to 28 miles per hour, although the Tom Thumb size of the cars and junior drivers often makes them seem to be going much faster.

Each track is operated by its own association. When a new driver wants to join, he must meet exacting membership qualifications. If he has competed before at another track, he merely proves his driving ability. However, in case he is a new contestant, he must attend the track's driver school and then race as a novice for a period which varies from six weeks to six months, depending upon his experience and local requirements.

Demonstrate Ability

All potential Barney Oldfields also must prove themselves competent before any race. This means that every entrant must circle the track to demonstrate ability in handling his car at full speed and show complete understanding of all rules and signals. Track safety committees check every car to make sure it meets all safety requirements.

One father who has a son racing regularly points out some of the constructive aspects of quarter midget racing:

"It allows a handicapped kid to gain self confidence in a competitive sport. My boy had polio three years ago and one of his legs is still affected. He can't take part in physical activities. Then I heard about quarter midgets. We built his car together, working nights in our garage.

"You should see him now. He has won a lot of races, his schoolwork has improved considerably, and the boosting of his morale alone is worth the price of a hundred cars."

Learn Safe Driving

What the sport has done for this boy is typical of its impact upon others. While having fun, youngsters are developing assurance and skills. They learn how to analyze situations quickly and coordinate responses accordingly. Quarter midget racing teaches them to drive safely and with respect for the other fellow. Above all, it creates good losers as well as modest winners—the essence of good sportsmanship. #



The Governor is an Oilman

From penniless immigrant to Montana's chief executive—that's the story of one-time rig builder Hugo Aronson



With Phil Dozier, of Barnwell Offshore Drilling, Governor Aronson inspects a modern rig—far different from the type he once built and moved.

WHEN CHIEF EXECUTIVES of the 50 states and four territories gather at Montana's Glacier National Park for the national governors' conference this June, their host will be a Swedish immigrant who has been closely associated with the oil industry almost ever since he came to America 49 years ago.

Affectionately known as "The Galloping Swede," big, friendly J. Hugo Aronson is in the last year of his second four-year term as governor of Montana. Behind him lie 26 years of public service in the adopted country for which he feels great gratitude and deep affection. Behind him, too, is extensive first-hand experience in oil that started in the early days of Rocky Mountain fields and continued through a recently-concluded term as chairman of the Interstate Oil Compact Commission.

Governor Aronson capsuled his oil background when he wrote to congratulate Governor David L. Lawrence of Pennsylvania on the Oil Centennial celebration last summer. One of the letters from chief executives of oil states that was transported

THE GOVERNOR IS AN OILMAN

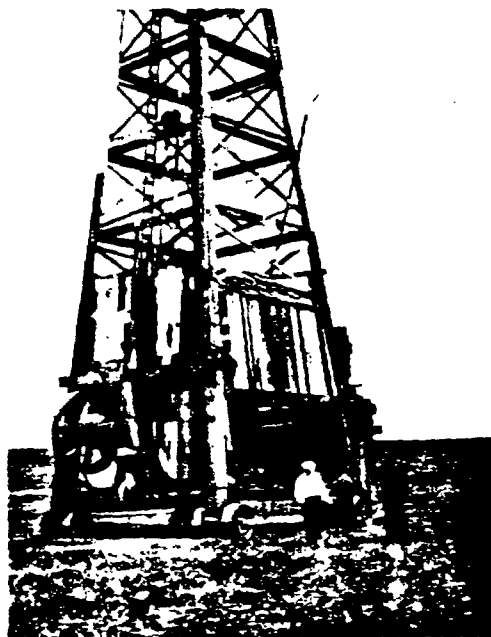
1,250 miles by pipeline, Governor Aronson's said:

"The oil industry has been my life through most of the years since I landed on our shores. . . . I have built rigs with a rig builder's hatchet in both Montana and Wyoming oil fields. I am proud that I was the first person to move an oil rig intact from one location to another. I was an oilfield trucker and contractor and have drilled several wells, most of them dry holes. Today, I am still connected with our great industry through drilling an occasional well and watching strippers bring in a few barrels."

Oil in Montana

In the same letter, the Governor outlined oil's part in his state's economy. "We in Montana got our first production less than a half century ago in 1915 at Elk Basin in Carbon County. Forty-two years later, in 1957, petroleum was the state's number one mineral in terms of total value of production. The future, we hope, will be even brighter."

Hugo Aronson's story began on a tenant farm in Sweden where he was born in 1891—almost 25 years before either he or oil became active in Montana. Upon the completion of his formal education



By jacking them up and mounting them on dollies, Hugo Aronson became "the first person to move oil rigs intact from one location to another."

at age 14, he hired out to work for \$25 a year—and dreamed of someday going to America. Last year, he returned to Sweden to receive from King Gustav VI the Grand Cross of North Star, one of his native country's highest awards.

Over the intervening years lies a life story that is living proof that America, indeed, is a land of opportunity.

In 1911, the 20-year-old future governor landed in Boston after a \$49 steerage trip across the Atlantic. He couldn't speak a word of English and had no friends or relatives in America. In his pocket was the \$25 required of all immigrants and in his ears his father's parting words of advice: "Whatever you do, do it well, no matter how humble the task. In dealing with men, never make a promise you can't keep. Always keep a promise once you've made it."

Three years later, Montana became young Aronson's home when an inhospitable brakeman invited him to descend from a freight train in the town of Columbus. Meanwhile, he had ridden boxcars as a non-paying passenger through 38 states from coast to coast. He had worked with railroad and construction crews, in lumber camps, brickyards, strip mines and on docks. He had slept in haystacks, hobo jungles and on freight car floors. But he had seen America, learned some of its language, and he loved it!

Befriended by the people of Columbus, he worked for a time as a ranch hand, but it wasn't long before he filed on a 320-acre homestead which, it turned out, was productive of little more than sagebrush and rattlesnakes. He built a cabin and furnished it with second-hand furniture and utensils.

Still Owns First Property

Forty-five years later, the Governor still owns the property. "I'll pay taxes on it until I die," he says with lingering pride in his first American home.

Before long, the brawny, energetic Swede was working his land with two teams of horses, hauling freight to the new oil center of Elk Basin, and helping to build a pipeline.

After two years of overseas service in World War I, Hugo Aronson saw his boyhood dream come true when he became a United States citizen in 1920. In the ensuing years, he became more and more active in oil. He built wooden rigs in the booming oilfields, was a connection foreman for a refinery and a tool dresser on a drilling crew.

He acquired the sobriquet "The Galloping Swede" because of the hustling pace at which he did his work.

The future governor formed the Sunburst Construction Company in 1924. He developed a method of jacking up 85-foot rigs, putting them on dollies and pulling them to new locations in a matter of hours. This, of course, represented big savings over the ten or more days usually required to dismantle, move and rebuild rigs at new sites.

Business prospered as new oilfields opened up in Montana. "The Galloping Swede" trade mark became well known in trucking and pipeline construction, too. When he sold his interests in the organization in 1948, it was the biggest trucking and rig building company in the state.

Meanwhile, starting in 1934, the deep gratitude the former immigrant boy felt for the country that had offered him so many opportunities compelled him to run for public office. Successively, he was elected and reelected to the Cut Bank, Mont., city council, the state house of representatives and the state senate. Finally, yielding to pressure that had been building up for quite a few years, he ran for governor in 1952, was elected and then reelected in 1956. He is the second Republican governor in the state's history ever to be reelected.

Stiff Opposition

Carrying out his programs has not been easy with the offices of lieutenant governor, secretary of state, attorney general, treasurer, auditor, three railroad and public service commissioners and both houses of the legislature controlled by the opposition party.

In public office, the governor has attempted to apply the same hard-working, straightforward, sound practices that made him a successful businessman. He is an ardent advocate of free enterprise and balanced-budget, pay-as-you-go government.

As governor of the "Treasure State," rich in other mineral resources besides oil, Hugo Aronson understands the importance of percentage depletion to extractive industries. His background in the oilfields made him especially well qualified to serve as chairman for 1959 of the conservation-minded Interstate Oil Compact Commission.

He has climbed rigs in early Rocky Mountain fields that had been blackened by the oil of wasteful gushers, has seen improper drilling practices fail to tap subterranean deposits, and has stood helplessly



The oilman-governor discusses Interstate Oil Compact Commission affairs with Kansas' Governor Docking, Illinois' Stratton (left and right) and Lawrence Alley, IOCC executive secretary (standing).

by as precious crude poured out on the ground, never to be recovered. But he also has witnessed the strides the industry has made in more recent years and is proud to have contributed to them.

Retired from the oilfield trucking and construction business, the Governor has many interests to occupy the few minutes he can spare from state affairs. He has a 4,440-acre wheat farm in Glacier County, is a bank president and member of many civic, fraternal and public service organizations. With his wife, the former Rose McClure, one-time Glacier County superintendent of schools, and 15-year-old daughter Rika, he lives in the governor's mansion in Helena and owns a home in Cut Bank.

Big Debt to Repay

Hugo Aronson is an oilman, a businessman, a farmer and above all an American. When asked if he plans to retire from politics at the end of his second term, his lined, weather-beaten face and the still-sparkling blue eyes that once stared in wide wonder at the glories of America take on a serious mien. "I've already told the people of Montana that I will not be a candidate for governor again or for the United States Senate," he says. "But I don't think I could ever retire from public service. I owe this country far more than I can ever repay. As long as there is an opportunity, I'll try to help." #

Two Ethyl Researchers Named to SAE Board of Directors

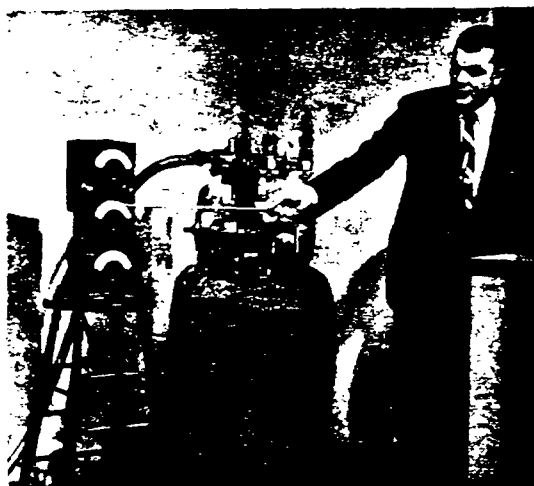


John S. Wintringham



Gilbert Way

TWO EXPERIENCED MEMBERS of Ethyl Corporation's Research and Development department have been elected to the board of directors of the 25,000-member Society of Automotive Engineers. John S. Wintringham, special products research advisor, and Gilbert Way, research representative, were named to the SAE governing body in January. Both men are active long-time members of the Society. Mr. Wintringham has served on the Passenger Car Activity Committee for several years. Mr. Way has been on the Fuels and Lubricants Activity Committee and has been elected its chairman, in addition to his directorship, for 1960.



AN ETHYL CORPORATION DEMONSTRATION ENGINE was used by Dr. Calvin A. Vander Werf, University of Kansas professor, to explain gasoline antiknock quality in a TV lecture on "Petroleum and Motor Fuels" early in January. The lecture was Lesson 70 in the Continental Classroom series on Modern Chemistry which is televised nationally by NBC.

New Vacuum Pump Helps Unload Antiknock Compounds

A NEW VACUUM PUMP SYSTEM that will make unloading of antiknock compounds at many refinery mixing plants easier, safer and more efficient has been developed by Ethyl Corporation. Now available to refiners in the United States, Canada and overseas, the new equipment is expected to be most useful at plants where: (1) large numbers of antiknock compound drums are handled; or (2) faster unloading of tank car, tank truck and sealand shipments is desired; or (3) where operations have been affected by insufficient vacuum.

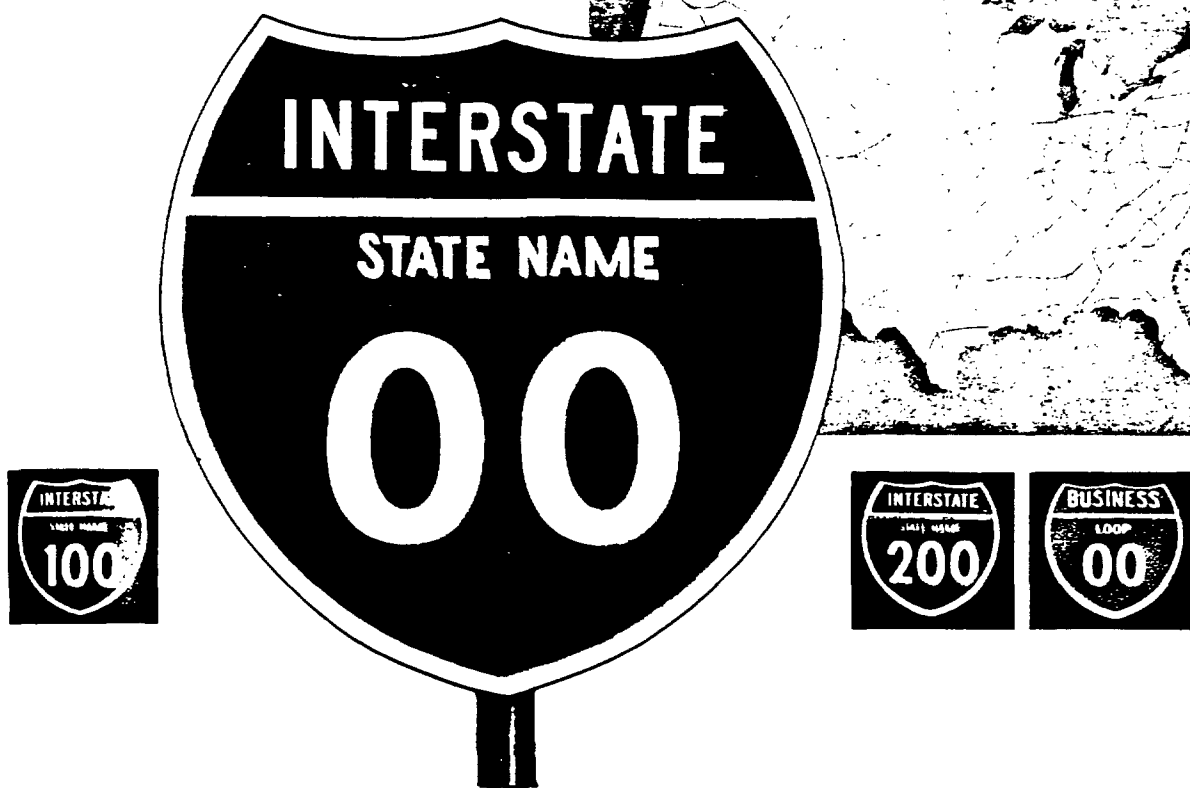


The unique system facilitates unloading by increasing the vacuum in mixing plant tanks. It was developed at the Company's mixing plant at Houston, Texas, after an exhaustive study by Ethyl engineers for a number of years. A patent application for it has been filed.

The basic parts of the system are a vacuum pump with motor and a small tank. These parts can be tied in with existing facilities or built as part of a new plant. In either case, the vacuum pump system is only for unloading operations and not for mixing antiknock compounds with gasoline.

Domestically, Ethyl is the first antiknock compound supplier to offer a vacuum pump system to refiners. Abroad, the system is expected to be more efficient and economical than those in current use.

Its introduction is part of Ethyl Corporation's continuing program of assisting refiners in the efficient handling of antiknock compounds. #



SIGNS OF PROGRESS

WITH THE COMPLETION of long smooth stretches of the 41,000-mile National System of Interstate and Defense Highways, new route markers are appearing at roadside locations in many parts of the country. Red and blue shields with white letters and numbers, these markers were adopted by the American Association of State Highway Officials to display the route numbers of the new superhighways that are becoming parts of the new national system.

On the shields, rural routes of the interstate and defense highway system are designated by two-digit numbers. Following established practice, odd numbers indicate north-south routes and even numbers mark east-west routes.

In addition, loops through and belt routes around cities and interstate spur routes are indicated by three-digit numbers. The first digit is even on the loop and belt routes and odd on the spurs.

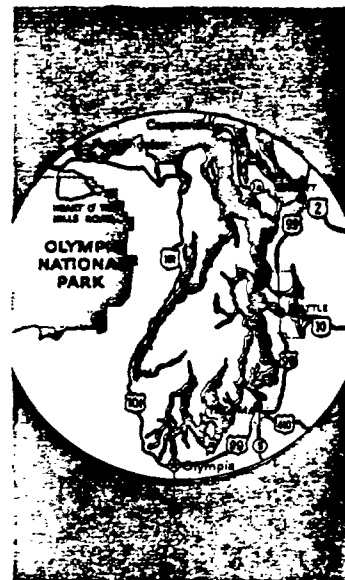
Green shields, with white lettering and numerals,

are used to direct traffic through and into the major business section of cities that are bypassed by officially designated interstate routes.

The modern highways of the interstate and defense highway system are being built under a 13-year program of state and federal government cooperation established by the Federal Aid Highway Acts of 1956 and 1958. Ninety percent of the initial cost is paid by the federal government, while the states pay 10 percent plus all maintenance costs.

Crossing the country from the Atlantic to the Pacific and from Canada to Mexico, the system will link 42 state capitals and 90 percent of all cities of over 50,000 population. Its 41,000 miles of highways will account for little more than one percent of the country's 3,360,000 miles of roads, but they are expected to carry more than 20 percent of all traffic.

The colorful, shield-shaped route markers are designed to help speed the flow of this traffic. #



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

Your car makes any map a Magic Circle

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



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



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



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



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



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

ETHYL NEWS

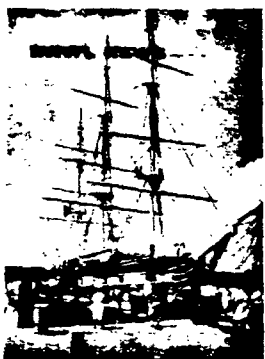
MARCH-APRIL 1966



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ETHYL NEWS

MARCH-APRIL 1960



THE COVER pictures the Charles W. Morgan, last remaining sailing ship of a once-mighty whaling fleet that took hardy New Englanders "Harpooning for Oil on the Seven Seas" (pages 6-9). Now berthed permanently at Mystic, Conn., it is a mecca for sightseers and is typical of the many fascinating things there are for motorists to see—by car. Ethyl Corporation's market expansion program reminds automobile owners of these things more effectively than ever this year as you'll read in "Magic Circle 1960" (pages 10-12).

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ETC 29393

Which Fuel

OIL COAL GAS



Consumers—not the government—should retain the right to answer this question

NO ONE WOULD TOLERATE federal interference with his choice of brick, stone or cinder block to build a new home. The housewife would rebel at edicts from Washington restricting what meats or vegetables she could buy for the family table. Who would stand for laws specifying the kind of fabrics to be used for clothing?

And yet a comparable threat to the American consumer's freedom looms in proposals for the establishment of a "National Fuels Policy." Designed ostensibly to assure the country of adequate fuel supplies, such proposals would give the government control of all fuel consumption. Statutes would specify who could burn oil and for what purposes; who would be permitted to consume natural gas, and who must—whether he prefers to or not—stoke his furnace with coal.

Unprecedented as these limitations would be, they are being supported by lobbyists representing such organizations as the National Coal Policy Conference and the National Coal Association. Opposing ranks include thoughtful legislators and government executives, leaders of the oil and gas indus-

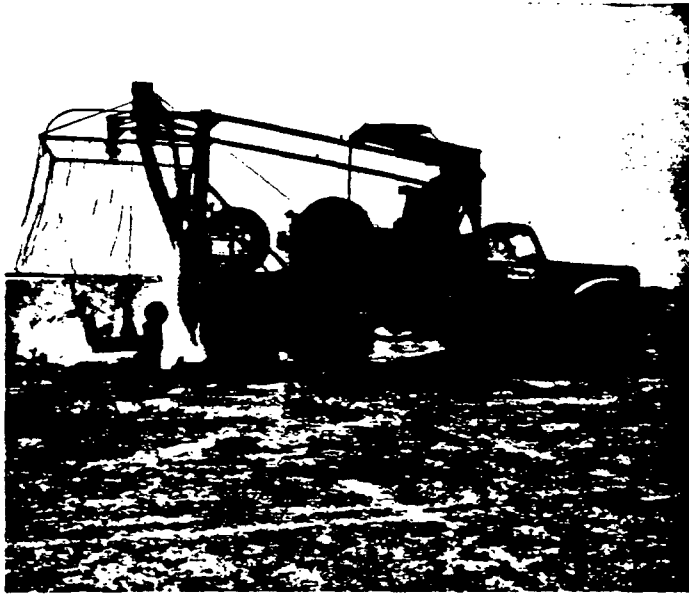
tries, economists, geologists, market analysts, financiers, social scientists and others concerned with our country's economic health.

Although professing concern with the national welfare, coal has selfish reasons for endorsing restrictions on the consumption of rival fuels. It wants to recapture former customers lost to oil and gas, and to cut down further competitive erosion of its markets in the future.

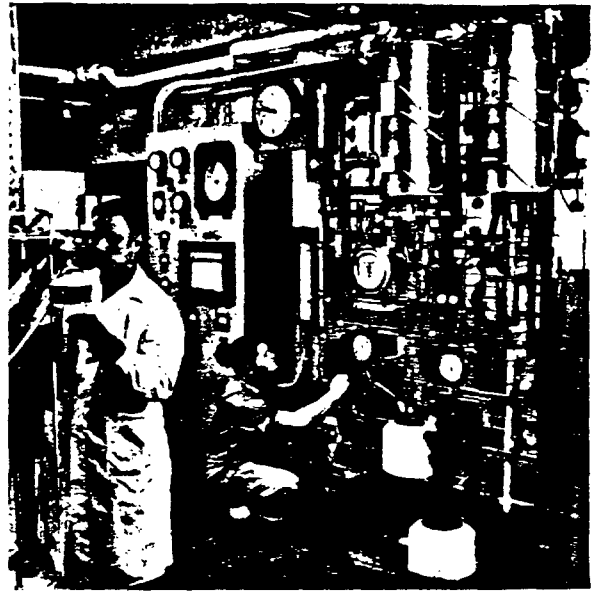
Threat to Free Enterprise

A less obvious but more fundamental aspect of the proposal is the threat it poses to our free enterprise system. Impartial observers point out that if coal's campaign leads to legal restrictions on the end uses of fuels, floodgates would be opened for a national socialistic economy. Control of energy could lead to government control of all industry.

Coal, as most people know, was once the dominant fuel in America. In 1920 it provided more than 78 percent of the nation's mechanical energy. Petroleum, including oil and natural gas, accounted for a mere 18 percent at that time. Since then, however,



The size of the country's proved reserves of petroleum has increased year after year as a result of advanced exploration methods.



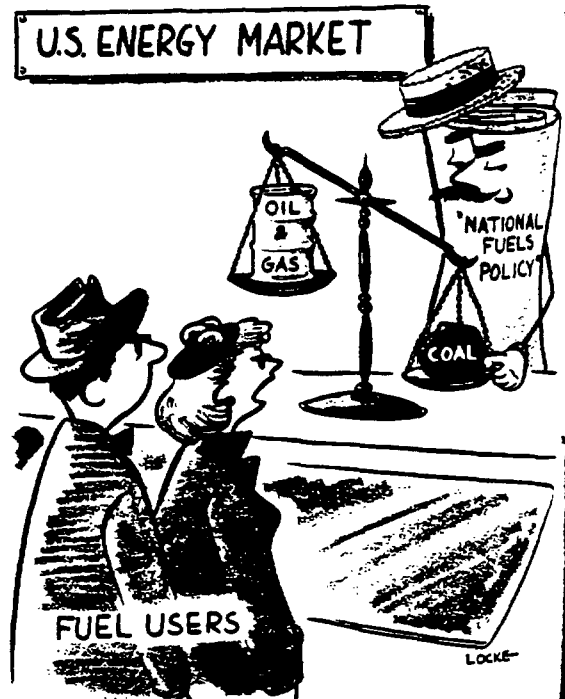
One reason for oil's gaining an increased share of the energy market has been intensive research leading to better product utilization.

petroleum fuels have made enormous strides forward, while coal has lost ground. By 1958, coal was supplying only 24 percent of our fuel needs, as compared with 78 percent from oil and gas.

A continuing and expanding preference for liquid and gas fuels over solid types explains why wells have replaced mines as our principal energy sources. Before railroad dieselization in the late 1940's, for example, steam locomotives consumed 110 million tons of coal annually. Today they use less than four million tons. Oil and natural gas heat 77 percent of the nation's homes, as compared with 15 percent using coal. (See *Oil Puts the Heat On*, ETHYL NEWS, Nov.-Dec. 1959.)

But in spite of this decision, rendered by consumers, the coal industry is attempting to salvage its chestnuts by depriving people of their right to use whatever fuel they prefer. Coalmen and their supporters would permit the use of oil and natural gas only under limited conditions and for specific purposes fixed by law. These measures would make other markets the coal industry's preserve.

Backers of this scheme claim that oil and gas should be used more sparingly, because reserves are running low. By contrast, enormous deposits of



"TAKE YOUR THUMB OFF THE SCALES!"

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coal are cited, enough to last for many centuries.

The truth is that the end of our country's petroleum reserves is nowhere in sight. We are not running out of oil. We are not running out of natural gas. On the contrary—estimates of ultimate recoverable reserves made by the United States Geological Survey are increasing year after year. The totals now stand at an all-time high of 300 billion barrels of crude and more than 250 trillion cubic feet of gas. Estimates from other sources are still larger.

The oil industry's conservative estimates of underground inventories are similarly reassuring. The nation's proved reserves, in fact, are four times more than the total crude produced in the United States during the last 100 years.

The prophets of oil's doom fail to appreciate the impact of new discoveries on total available oil and gas resources. Furthermore, scarcely a nod of recognition is afforded our vast resources of oil shale. These multi-trillion-ton deposits are potential sources for incalculable amounts of petroleum and fuel gas.

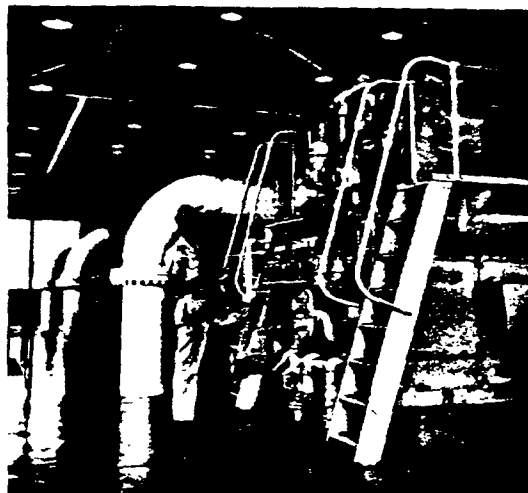
At the same time, the usefulness of America's coal reserves is being distorted when their size is touted instead of their practical availability. The President's Materials Policy Commission, known also as the Paley Commission, has found that only a small fraction of all coal deposits can be mined, shipped and sold at anything like reasonable costs.

Competition for Markets

Further inability to recognize basic realities is seen in the coal interests' claim that no national fuels policy exists. As they urge "overdue action" to establish one by legislation, coalmen do not concede that this country has always reaped the benefits of the most effective policy for all businesses: continuing competition for present and future markets.

Anyone with even a minimum knowledge of the heating field is aware that competitive enterprise and initiative are vital ingredients of the leadership which petroleum-based products enjoy today. The oil industry and related enterprises are investing more than \$300 million annually in research, with a proportionate share contributing to more efficient heat at reduced costs. Coal is spending far less on improving product utilization.

If statutory controls are set up over the end uses of fuels, there would be an inevitable effect upon the consumer's pocketbook. Wherever coal became the



Fast-growing natural gas now supplies about a quarter of the country's energy requirements.

only heat source permitted, prices would soar. In the long run, our industrial strength and national prosperity would suffer from depletion of sufficient low-cost energy.

Maneuvering with vigor and skill, the coal faction and its supporters are campaigning for legislative action on the controversial fuels policy question during the current Congressional session. Their efforts include attempts to win over more senators and representatives, including those from oil and gas states. A renewed barrage of propaganda is being used to nullify arguments against government fuels controls.

The intensity of such efforts calls for still more aggressive measures by all those favoring continuation of the present competitive system of free enterprise. Repeated emphasis on the issue's points, as summarized by Fred A. Seaton, Secretary of the Interior, is needed. Says Mr. Seaton:

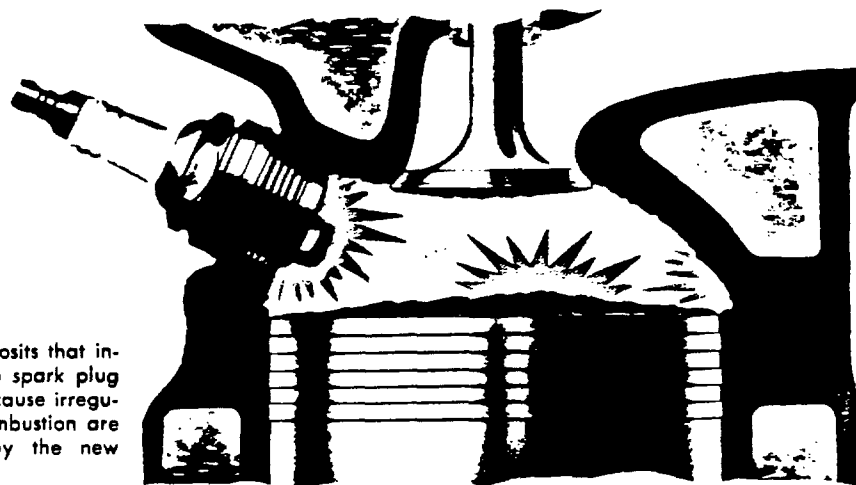
"It is not a proper role of our government to carve out or 'freeze' a portion of the total energy market for each competing fuel . . . The consumption of fuels should continue to be determined by



Interior Secretary
Seaton

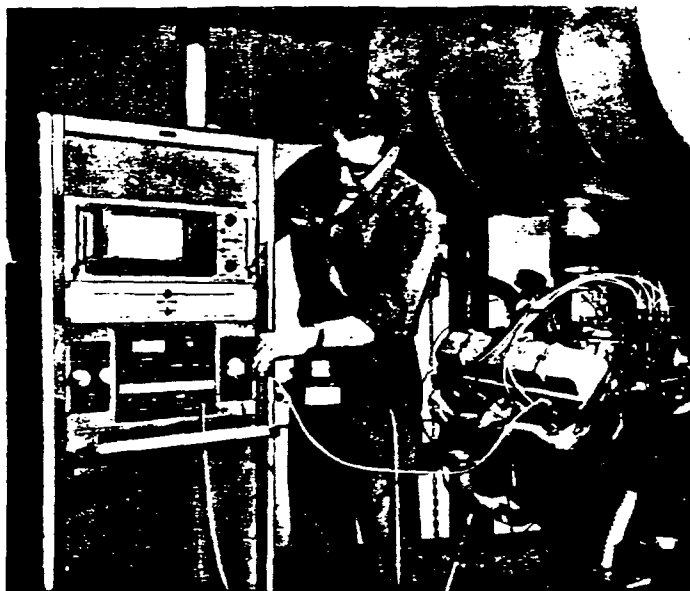
such factors as relative cost at specific locations, efficiency of use, dependability of supply, cleanliness, convenience, ease of control—in short, a combination of consumer preferences and cost per BTU delivered at the burner." #

ETHYL CORPORATION PRESENTS



Engine deposits that interfere with spark plug firing and cause irregular fuel combustion are modified by the new additive.

The improved performance of gasolines containing ICC 4 has been demonstrated in laboratory tests.



New ignition control compound is exceptionally effective in controlling preignition and spark plug fouling

PROBLEMS LIKE PREIGNITION, spark plug fouling and rumble can be controlled with exceptional effectiveness by the use of a new low-cost gasoline additive being introduced by Ethyl Corporation this spring. Known as Ignition Control Compound 4, it is made of trimethyl phosphate and is the fourth member of Ethyl's family of ignition control compounds used advantageously since late 1953.

Its properties verified by extensive research, ICC 4 combines the most desirable potentials of related additives with the advantages of greater economic efficiency. No other product of its kind contains such a large proportion of active phosphorus.

ICC 4 will be available to Ethyl customers in commercial quantities at prices "substantially below" those of competitive additives on a pound-of-phosphorus-content basis. Much of this price advantage

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ICC 4

tage stems from manufacturing processes carried out at Ethyl's plant in Baton Rouge, La., where shipments originate.

A particularly gratifying characteristic of the new compound is its ability to modify troublesome engine deposits without significantly reducing the octane numbers of gasoline. Certain other phosphorus additives lower octane numbers so drastically that gasoline quality is seriously impaired. High stability is another desirable feature of ICC 4.

During dynamometer and road evaluations, the use of ICC 4 had no adverse side effects on engine durability. Piston rings, valves and other parts experienced normal wear in all respects. Experimental quantities of the compound have been supplied to oil companies for their own testing procedures.

Like preceding ignition control compounds developed and introduced by Ethyl, ICC 4 is being offered as part of the Company's continuing efforts to help the oil and automotive industries overcome basic problems. Preignition, spark plug fouling and rumble are comparatively new phenomena brought about to a large extent by modern driving.

Deposits Cause Trouble

Repeated stopping and starting in heavy traffic, for example, creates excessive carbonaceous deposits in automobile engines. These deposits interfere with normal spark plug firing and disrupt car performance further by becoming so hot that they cause irregular fuel combustion. Rumble is a related problem of abnormal combustion occurring in some late model automobiles, and is heard as a low-pitched thudding sound.

Automotive engineers and oil industry specialists agree that elimination of these difficulties is highly desirable in the continuation of motorized trans-

portation progress. What Ethyl's ICC 4 and other phosphorus compounds do is to change the composition of troublesome engine and spark plug deposits so that their harmful effects are neutralized.

It is generally believed that ignition control compounds will be increasingly important as compression ratios increase in the still more efficient gasoline engines of tomorrow's cars. As the need arises, Ethyl intends to continue research on preignition and other developments related to engines, lubricants, fuels and fuel additives. #



Urban stop-and-go driving contributes to the formation of carbonaceous engine deposits, a cause of preignition and spark plug fouling.



Harpooning for Oil on the Seven Seas

Long before the days of offshore
wells, the ocean was the main source
of illuminants and lubricants

By Stanton P. Nickerson

TALL SPOUTS were seen to leeward, and two boats were launched in pursuit. A gigantic Sperm Whale lay rolling in the water like the cap-sized hull of a frigate, his broad back glistening . . .

As we glided in chase, the monster flitted his tail forty feet into the air . . . Then every oarsman strained forward . . . like desperadoes they tugged and they strained, till the harpoon was hurled . . . fast and true.

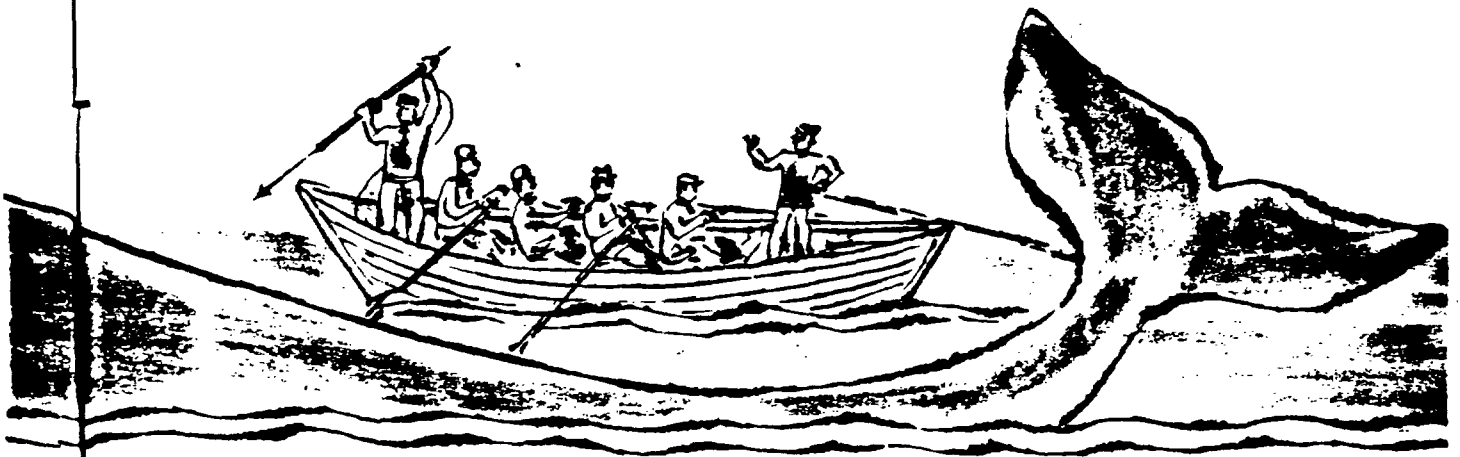
At length the whale somewhat slackened his flight . . . all hands began pulling the boat up to him. Soon ranging up by his flank, Stubb darted his long sharp lance into the fish, carefully churning and churning . . .

The monster began to wallow in a mad cauldron of spray, spasmodically dilating and contracting his spout-hole. At last . . . red gush after red gush shot into the air; and ran down into the sea . . . His heart had burst!

Adventures like this, as described in Herman Melville's blue-water classic, "Moby Dick," sparked the lives of yesteryear's mariners who sailed the seven seas hunting for whales. The world's largest mammals, whales were America's principal source of oil before the discovery of petroleum in Pennsylvania.

Twenty to 30 times the size of a full-grown elephant, often 100 feet long and weighing up to 100 tons, a large whale would yield close to 150 barrels of oil and some 2,000 pounds of bone.

From pre-Revolutionary War times until the middle of the past century, virtually all domestic



and commercial oils came from whales. At least 15 million gallons were being taken annually by 1845.

In addition to feeding the wicks of lamps for homes, streets, shops and lighthouses, whale oil was used in the best candles, ointments and soaps, and in curing leather. It lubricated machinery and greased the axles of stagecoaches, wagons and the first railroad trains.

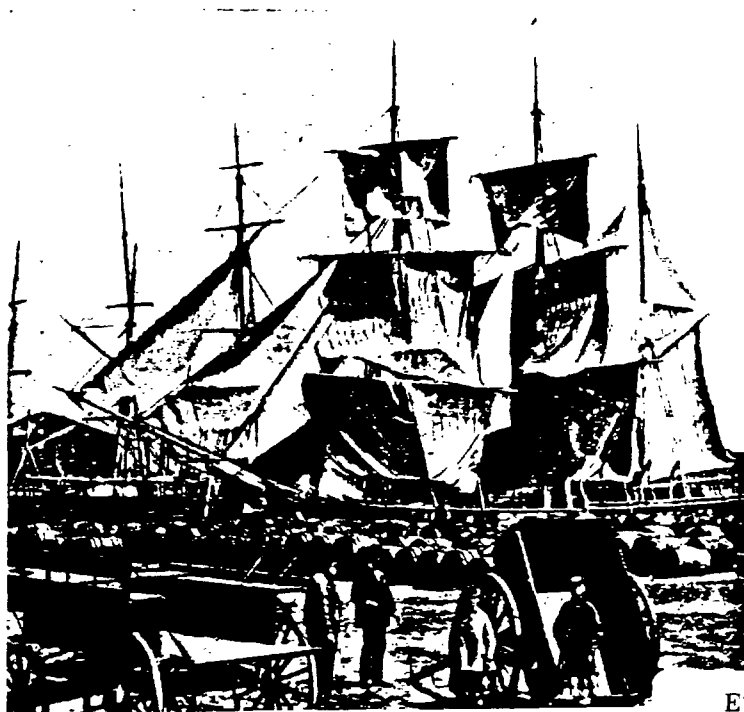
Whalebone stiffened milady's corsets and hoop-skirts. Articles made from ivory-like teeth, jawbones and other skeleton parts included buttons, canes, umbrella ribs and handles, billiard balls, jewelry, combs and brushes, household utensils, piano keys and a variety of ornaments for Victorian

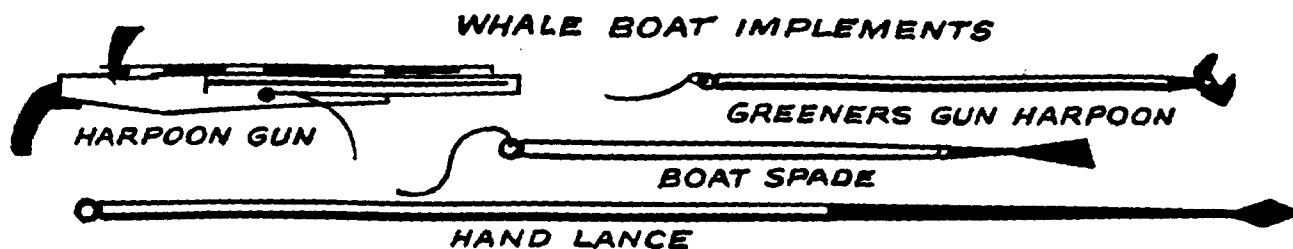
parlors. Rare ambergris, a growth sometimes found in the alimentary canals of sperm whales, brought high prices from perfume manufacturers.

A rapidly expanding America depended on whalers for these and other requirements for nearly 200 years. But by 1859, when Colonel Edwin L. Drake touched off the new era of "rock oil," products from ocean leviathans were becoming scarce and prices fluctuated disastrously.

Competitive as the two industries were for a brief span of years, there never was any doubt about which one would win. Meanwhile, the new kind of oilmen and their older rivals shared a number of similar characteristics. Both loved excitement and adventure. They thrived on the battle

Whale oil, unloaded by the barrelful at New England seaports, was burned in lamps like this to light the homes of America before 1859.





of man versus nature. Playing life's game for high stakes was the kind of challenge they most enjoyed.

A full measure of such rewards was in store for whalers, from the time the lookout cried "Thar she blows!" until the dangerous and gory kill.

Sometimes, after being speared, a whale "sounded"—diving into the depths—and had to be played like a giant trout. Many times, of course, it broke loose and escaped.

When fortune smiled and the catch was assured, it would be floated back to the mother ship for hours of backbreaking and highly aromatic processing. Reservoirs of clear oil in the head were dipped out, valuable whalebone removed and fatty blubber boiled in "try pots" set up on deck to produce more oil for waiting barrels. Unwanted parts of the animal were dumped overboard.

Shipboard Suffering

The lives of whalers were anything but ideal. Struggles with the elements continued almost without interruption. Discipline was rigid and floggings were common. Crew quarters were cramped and rat-infested. Cockroaches leavened the scanty and monotonous food. Cruel working hours under miserable conditions were part of a fate which often included crippling injury or death.

A typical ship's log, for example, reports that after a school of whales had been sighted and the pursuit was underway, "one monster turned about and et the boat Entirely up."

No reliable tally exists for the number of whales caught by Americans from Colonial times until the collapse of large-scale operations about 1900. Estimates put the total kill at somewhere around 250,000. Nearly 10,000 sperms, rights, bowheads and humpbacks were slaughtered annually in the 1840's, when the whaling industry was at its peak.

Venturing from polar regions to equatorial doldrums and often into waters then unexplored, over 700 vessels from the United States once represented some two-thirds of the world's whalers.

More than 15,000 Americans were at sea during

the industry's heyday, and countless others were employed ashore in related management, outfitting and selling jobs. In New England, from which most of the ships sailed, only the textile and shoe industries were larger.

Even by modern standards, whaling was big business. At its height, fleet capacity approached 250,000 tons and was valued at \$28 million. Total proceeds from successful voyages had reached a yearly high of some \$12 million by 1850. Many a captain returned home with oil and bone valued at \$100,000 to \$200,000 or more. Profits of 100 to 300 percent were not unusual.

Massachusetts ports on Cape Cod and others like Nantucket and New Bedford doubled and redoubled in size and wealth. In Connecticut, whaling brought riches to New London, Saybrook and Stonington. Towns on New York's Long Island shared the industry's bounty too.

Tangible evidence of how ship-owners and captains prospered remains today in the stately mansions, graceful churches, parks and public buildings in these and other communities. Whaling money also helped endow colleges and universities, hospitals and charitable organizations.

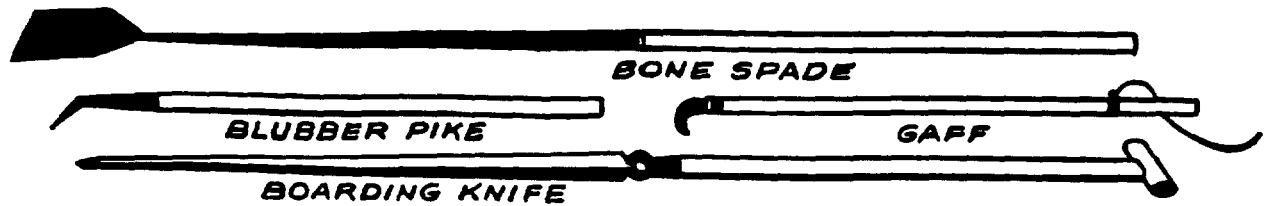
Financial Losses Frequent

But like the petroleum industry which followed it, whaling was not always profitable. Because of unsuccessful hauls, about 10 percent of all voyages were financial failures. Additional losses occurred from desertions, mutinies, storm damage and shipwrecks. With sailors' pay geared to the amount of oil and bone taken, a foremast hand returning home in 1858 with little in his ship's hold received only \$54 after 46 months at sea.

The components of this fantastic era were shattered by many developments other than the birth and growth of the petroleum industry. One of the principal reasons for its collapse was a critical depletion of the most desirable whales, caused by their slaughter in such numbers for so long.

At the same time, innovations like illuminating

WHALE CUTTING IMPLEMENTS



gas, the availability of more fats from domestic animals and the introduction of materials better than whalebone had telling effects on demands and prices. The oil industry, of course, stiffened whaling's competition still more, particularly with kerosene and lubricants.

When exploited oceans had to be combed on voyages lasting at least four years, with increasingly poorer chances of success, obtaining financial backing to outfit ships became more difficult. Neither was it easy to recruit enough sailors willing to gamble for dubious stakes.

Whaling Wanes

Although once offering such a complete package of profitable zest that it brooked no rival, the appeals of whaling at last trailed far behind the California gold rush of 1849, the discovery of precious ores in the Rockies, the dynamic expansion of western frontiers and the golden era of purse-fattening clipper ships.

The Civil War nearly finished the whaling industry. Scores of ships were commandeered by the Union. Others were captured and burned by the Confederacy. Just as a post-war revival was gaining momentum, 40 vessels were crushed to bits in icebound Arctic seas.

By 1886, the once-proud American fleet had been reduced to 124 ships and by 1900, there were a mere 42. The only survivor is the *Charles W. Morgan*, a windjammer of the 1840's, which sailed for the last time in 1924. She is now preserved at Mystic Seaport, Conn.

Today the world's whaling is handled entirely by 19 vessels, all of them floating factories under foreign ensigns. Oil obtained is used for special lubricants, and for fats, margarines and soaps. Ironically, like their predecessors, these modern ships now face a scarcity of prey and erratic prices.

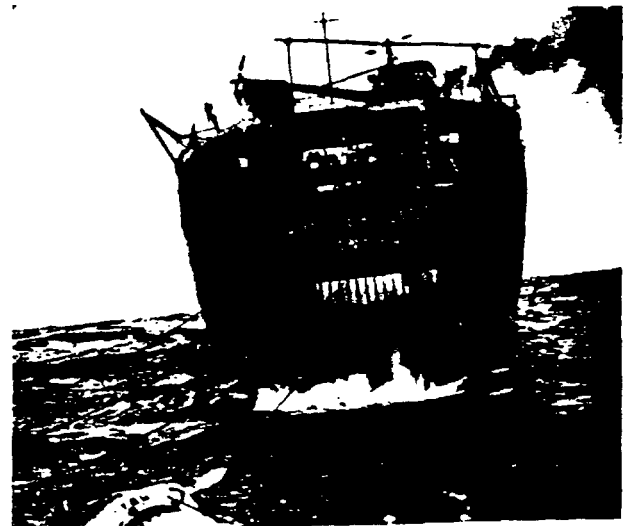
In "Moby Dick," Melville was prophetic indeed when he wrote, "... then all collapsed, and the great shroud of the sea rolled on as it rolled five thousand years ago."#



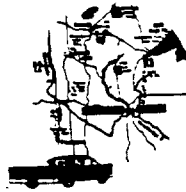
As recorded in a ship's log, "one monster turned about and et the boat Entirely up" . . . Below, whalebone pie crust crimpers and a "scrimshawed" whale's tooth show some uses to which byproducts were put by industrious Yankees.



Today's whaling fleet is made up of floating factories that take on catches at the stern.



CENTRAL



**Have you made a
Magic Circle Trip lately?**

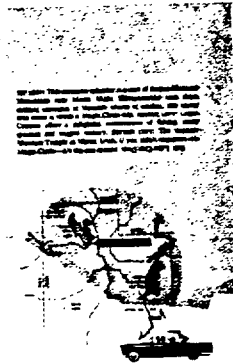
When you take your first steps into the world, you are probably not prepared to discover just how much life can change over the course of a year. You may find that the things you thought were important are not, and that the things you thought were not important are. You may find that the things you thought were important are not, and that the things you thought were not important are. You may find that the things you thought were important are not, and that the things you thought were not important are.



STYEL CORPORATION
New York 17, New York
Styels Corp., of Canada Ltd., Toronto
The Styel Corp. manufactures and produces
a Styel-processed, a full range of
cell and paper for the various applications
to all companies to explore our products
and many others.



WEST



Have you made a
Magic Circle trip lately?

[illegible]

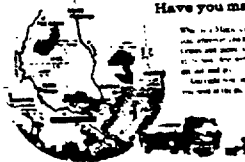
ETHYL CORPORATION
New York 1, New York
Export Corp. of Canada Ltd. Toronto
1 to 1000 Cwt. water capacity are available
in Ethyl Corporation's new line of water-
tight steel drums. Each drum contains steel
in its construction throughout to protect the
contents and also prevent leakage.



This Magic Circle advertisement, in full color, appears on the back cover of this issue of Ethyl News.



Have you made a Magic Circle Trip lately?

[illegible]

STEEL CORPORATION.
NEW YORK
The above corporation is authorized to sell securities in New York City and its vicinity and to collect interest thereon and to pay dividends thereon.

EAST



These are some of the many scenic spots that can be reached by the Magic Circle route. For more information, see the Magic Circle map in this advertisement.

Have you made a Magic Circle Trip lately?

By following the Magic Circle route, you can enjoy the best of the country's scenic spots, historic landmarks, and recreational areas. Magic Circle trips are easy to plan and take. Just follow the Magic Circle route, and you'll be on your way to the best of the country.

ETHYL CORPORATION

1911 Corporation of Chicago and Toledo, Ohio. Ethyl Corporation is a subsidiary of the Standard Oil Company of New York.

MAGIC CIRCLE 1960

Market expansion program features regionalized advertisements to appeal to motorists throughout the country

FOR SEEING THE SIGHTS and having fun in the fascinating Magic Circles that blanket the country, there's nothing like the magic carpet provided by the family automobile. Conveniently, comfortably and inexpensively, families can enjoy outings, recreation and sightseeing trips by simply getting behind the wheel of the car and taking off for a day or a week-end. There's so much to see and do—everywhere—and it's all so easy, it should become much more of a habit.

That's the message of the Magic Circle market expansion program sponsored by Ethyl Corporation as a service to the oil industry for the last few years and which is being improved and extended in 1960.

With increased sales of gasoline and other service station products still one of the oil industry's major goals, Ethyl is renewing its efforts to help expand the demand. The Magic Circle program is designed to help by stimulating more driving.

MAGIC CIRCLE 1960

As in previous years, the program uses both advertising and publicity to get motorists and their families to drive more.

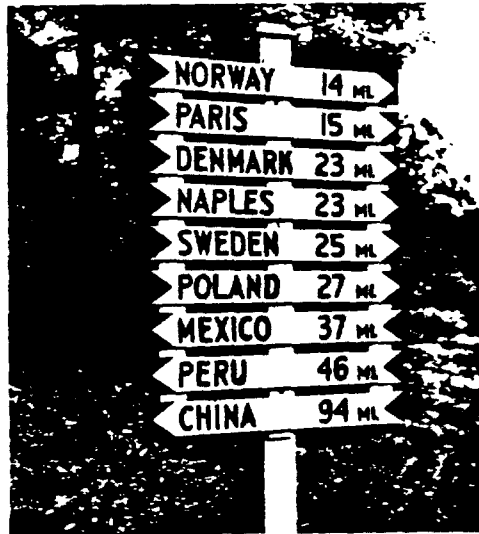
The colorful advertisements ask readers "Have you made a Magic Circle Trip lately?" This year they will appear in *Look*, *Life*, *Saturday Evening Post*, and, on the west coast, in *Sunset*. They will start in May and continue through the peak driving months.

Last year, surveys showed, Magic Circle advertisements were especially well read. In 1960, several improvements are expected to increase reader appeal even further.

In one innovation, full-color photographs rather than artwork will be used to illustrate places to go and sights to see.

Additionally, and for the first time, four different regionalized advertisements will run simultaneously in the same issue of each national magazine. A different ad will appear in each of four major geographic areas, tailor-made to appeal to people in that area. For example, the eastern edition will feature Washington, D. C.; the western, Salt Lake City; the southern, Oklahoma City; and the central, the Minneapolis-St. Paul area.

Magic Circle advertisements in full color also will appear in the Sunday newspaper supplement



As these signs pointing to Maine towns indicate and Magic Circle ads emphasize, there's almost no limit to places motorists can go.

Sunday, with the message localized for each of the 27 cities in which it is regularly circulated. To sharpen the attraction, a specific calendar of events, suggesting events to attend and places to see in each area, will be included.

Pinpointing its messages even further, the Magic Circle advertising program will again concentrate on the specialized audience of hunters and fishermen. Two-page spreads will run in the spring and fall in *Sports Afield* and *Outdoor Life*. They will reach more than 2,000,000 sportsmen and suggest to them new and rewarding places to hunt and fish—all of which are readily accessible by car.

More Publicity

The publicity phase of the Magic Circle campaign—the Travel Clinic—will be bigger than ever this year. Currently, some 175 major daily newspapers throughout the country use the Magic Circle tour articles in editorial space on a more or less regular basis. Each article, accompanied by animated maps, describes an inviting tour around a different city each week. To strengthen the appeal to get out and use the family car, these stories point out that no matter where the reader lives, there is a fascinating Magic Circle surrounding him, too.

Some 60 Magic Circle Travel Clinic articles will be distributed in 1960—more than one a week. Besides major daily newspapers, they will be circulated to some 500 smaller dailies and county seat weeklies in ready-to-print mat form.

This year will also see the extension of Magic Circle publicity to the field of radio. More than 350 leading women radio commentators across the country are being supplied with script material that will help remind listeners that the family car can be much more than a convenience to haul groceries and take children to school. It is anticipated that these non-sponsored messages will encourage mothers to suggest day and week-end automobile trips.

With the experience of recent years as a guide and with market expansion still the goal, Ethyl, then, will sponsor an expanded and accelerated Magic Circle program again in 1960. The program is based on the premise that one of the greatest opportunities for selling more gasoline and other service station products lies in increasing the amount of pleasure driving. Accordingly, it will again emphasize that the beginning of a good time is no further away than the family automobile. #

Progress with Proven Power

A review of proposed alternatives to the conventional gasoline engine and some reasons why none is likely to replace it in passenger cars

By John S. Wintringham
Ethyl Corporation Research Laboratories

IN THE EARLY DAYS of the automobile, the internal combustion gasoline engine established its superiority over steam and electricity. Since then, it has been just about the only power plant used in passenger cars.

In recent years, however, several new types of engines have received widespread publicity. Some of these have even been described as ready to replace the gasoline engine in passenger cars. The

group includes: diesel engine, gas turbine, free-piston engine, battery power, fuel cell, Stirling engine, and NSU engine.

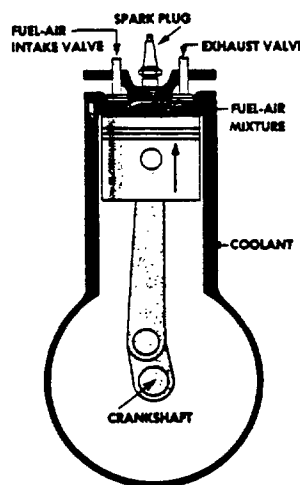
As the automobile industry moves into the "Sensational Sixties"—its eighth decade of existence—it is interesting to review the reasons for the superiority of the gasoline engine and at the same time examine the potentialities of the other proposed power plants.

GASOLINE ENGINE

The conventional gasoline engine is compact, powerful and economical. It can be made in large numbers at low cost and has a high degree of flexibility in operation. When conditions require a change in speed or load, the engine responds instantly to movement of the accelerator pedal.

The gasoline engine has another kind of flexibility. Its size can be chosen over a wide range to fit best the operating requirements. Its efficiency is substantially independent of its size. In a given vehicle, as engine size is reduced, ability to accelerate and to climb hills drops off, but fuel economy increases.

In order to replace the gasoline engine in automobiles, alternate power plants should be competitive with respect to size, weight, power, flexibility, economy, manufacturing cost, and general convenience.



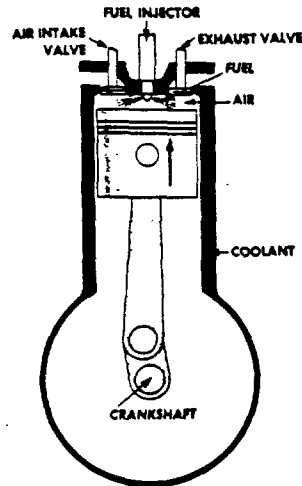
DIESEL ENGINE

In contrast to the gasoline engine which ignites fuel-air mixtures with spark plugs, the diesel engine ignites them by the heat of compression.

Compared with the gasoline engine, the diesel is larger, heavier, and more expensive. If too much fuel is fed into the air in a cylinder, the diesel engine produces smoke in its exhaust. This happens because there is insufficient time for the fuel to mix

adequately with the air, and for the fuel to vaporize completely. Because of this limitation on fuel input, the diesel engine must be about 30 percent larger than the gasoline engine for equal power output.

The diesel engine is inherently less flexible than the gasoline engine. The prime field for the diesel has heretofore been in heavy-duty trucks and buses



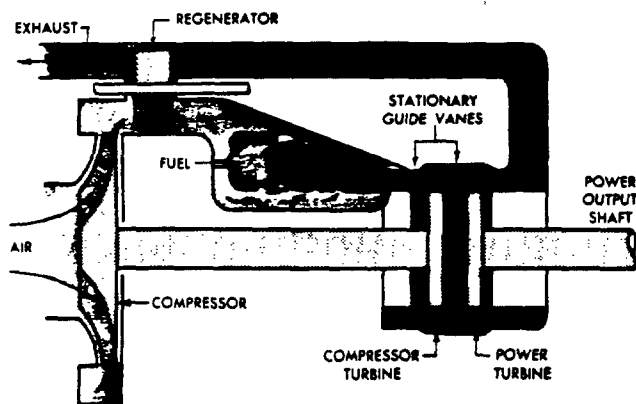
operating in intercity runs, and in off-highway equipment. Here, the operation is close to constant speed and load, and the high efficiency of the diesel engine has enabled it to offset its higher cost, when yearly operation is sufficient to produce substantial savings in fuel costs.

Presently, some taxicabs are being operated with small diesel engines. A substantial loss in performance is accepted. In addition, there are problems of hard starting in cold weather, and of noisy and odorous engine operation.

GAS TURBINE

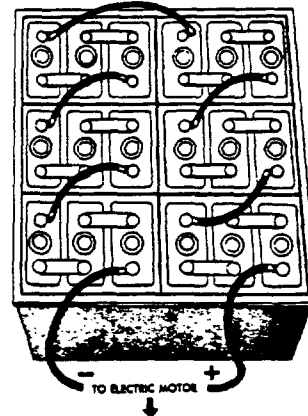
In an automotive gas turbine, hot gases are produced under pressure. These gases drive a turbine geared to the car wheels.

The gas-producing section consists of a centrifugal air compressor, a combustion chamber, and a turbine wheel which drives only the compressor. This unit has to be cranked up to about 15,000 rpm by a starting motor before enough hot gases



BATTERY POWER

A typical battery-powered car has a range before recharging of about 80 miles on level ground, and about 50 miles over hilly ground. The car costs \$2,800, and has 6.4 horsepower. The limited driving range and the time required for recharging make the battery-powered car undesirable as a family's main car. These factors and the high purchase price would seem to limit its appeal even as a second car.



are available to keep the compressor going. Above that speed, feeding more fuel into the combustion chamber provides more hot gases to turn the compressor and power turbines.

A gas turbine's rate of acceleration is sharply limited by the temperature its parts can stand. If fuel is added too fast, that temperature may be exceeded.

Because maximum allowable temperature also limits the efficiency of the gas turbine, use of special, high-cost alloys appears unavoidable. To be even reasonably efficient it also must have an efficient regenerator to transfer heat from the exhaust gases to the incoming compressed air. If the regenerator is designed to be only 70 percent efficient, instead of 90 percent, for example, fuel economy at 40 miles per hour drops from 20 miles per gallon to 12½.

The turbine is inherently simple, but it requires a long time to crank, accelerates slowly, and best fuel economy can be achieved only with expensive alloys.

FREE-PISTON ENGINE

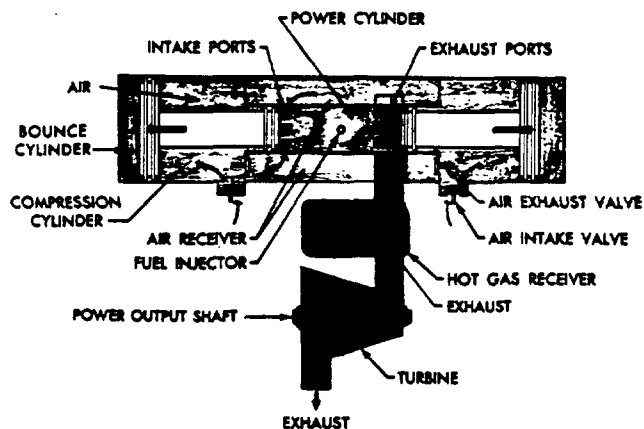
This engine produces hot gases at moderate pressure. These gases are used to drive a power turbine geared to the car wheels.

Hot gases formed by diesel combustion of fuel in the power cylinder force the pistons outward, compressing air in the bounce cylinders at each end. The pressure built up in the bounce cylinders is great enough to return the pistons to inner dead center, ready to begin the next cycle.

In the engine shown in the accompanying illustration, combustion gases exit as the right piston uncovers exhaust ports during its outward travel. When the pistons move outward, air is drawn into the compressor cylinder. From there it enters the power cylinder as the left piston uncovers intake ports. Some of the intake air flows through the cylinder and out the exhaust port before the pistons bounce back to cover the ports. This air joins the combustion gases to drive the power turbine.

The free-piston engine is heavy, noisy, relatively expensive and hard to start in cold weather.

In a car equipped with a free-piston engine designed to produce 100 horsepower, the fuel economy at 40 miles per hour is 23 miles per gallon.

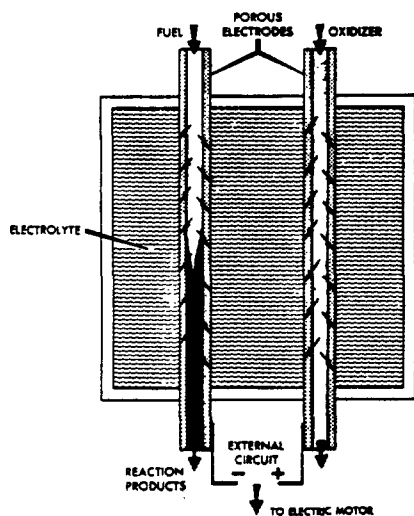


With a 300-horsepower unit, however, fuel economy at 40 mph is only 12 miles per gallon.

A comparison of the fuel economy of the gas turbine or free-piston engine with the gasoline engine shows that the gasoline engine is substantially more economical in the normal operating range. The advantage is so large that the gasoline engine can use a fuel which costs more, and still deliver more miles per fuel dollar.

FUEL CELLS

Fuel cell power plants are composed of a series of cells that produce current to power electric motors. In each cell, a chemical fuel and an oxidizer react, without burning, to form electricity. The efficiency of the conversion of energy into power can be as high as 65 percent as compared with about 40 percent in internal-combustion engines.



In the cell shown in the accompanying illustration, hydrogen is introduced through one porous electrode, and oxygen through the other. Their reaction, to form water, produces current.

Hydrogen-oxygen cells can operate at normal atmosphere temperatures. Cells using hydrocarbon fuels and air, on the other hand, normally operate at extremely high temperatures of around 900°F. This operating temperature can be reduced by using catalysts.

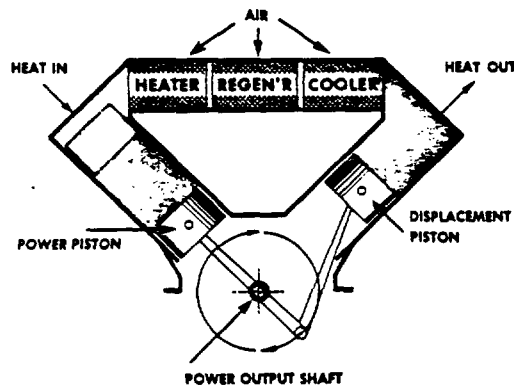
An experimental fuel-cell farm tractor has been produced by one manufacturer. The 20-horsepower fuel cell unit weighs 1,900 pounds. On this basis, a 200-horsepower fuel cell unit would weigh a staggering 19,000 pounds.

More favorable volume and weight data have come from other sources. For example, the most favorable published data indicate that it is possible to build a unit (including electric motors) with 1.1 cubic feet of space and 13.3 pounds per horsepower. But there is no evidence that the engine will find use in passenger cars.

STIRLING ENGINE

The Stirling "hot-air" engine, an external combustion engine, was invented in 1816 by a Scottish minister. Rather inefficient versions were used during the last century to pump water.

In operating the Stirling engine, heat is applied to the head of the cylinder, causing air or gas



inside to expand at constant temperature, pushing down the power piston on the left. The air then moves through the regenerator as the displacement piston on the right moves down. Heat is stored in the regenerator, and the air contracts. The air volume is further reduced by cooling at constant temperature, as the right-hand cylinder is water cooled. To complete the cycle, the air picks up heat in the regenerator.

Within the past two decades, the engine has been redesigned to produce high efficiency. However, it is expensive and difficulties are encountered in changing its power output rapidly. For equal power output, the Stirling engine requires two or three times as much radiator surface as a gasoline engine.

For these reasons the Stirling engine is not attractive as an automotive power plant.

THE FUTURE

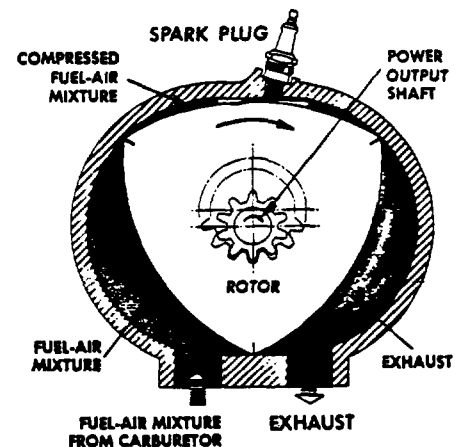
From the foregoing, it appears that none of the alternate power plants is likely to replace the gasoline engine in passenger cars. Apparently, however, the public is becoming interested in better fuel economy in terms of more miles per dollar. This trend is expected to develop as more and more imported and compact cars join America's passenger car population. It may also affect the size of engines in full-size cars, and their weight and dimensions.

NSU ENGINE

An American manufacturer recently acquired U. S. rights to this German gasoline engine which has only two moving parts—a triangular rotor and a crankshaft. As the rotor turns inside the housing, a fuel-air charge is drawn in through a fixed port, compressed, and then ignited when it passes the spark plug. The expanding combustion gases push the rotor around until they exit through the exhaust port.

Some part of this sequence is going on at all times in each of the three chambers formed by the rotor's sides and the housing. Thus the engine's operation is virtually continuous intake, compression, expansion, and exhaust. Operating speeds are high; small units are reported to have turned 17,000 rpm.

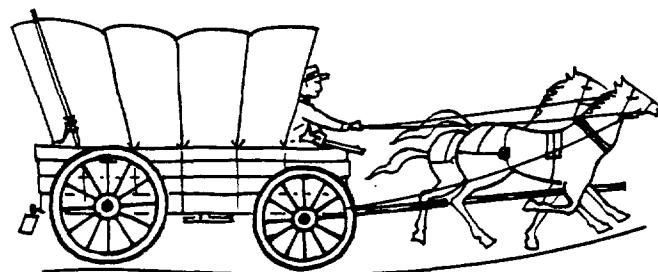
The NSU engine poses very difficult sealing and lubrication problems. Some qualified American engineers believe these problems are insurmountable when high power output is desired.



Of the 56.5 million cars in use at the end of 1959, 4.2 percent were small cars. At the end of 1964, it is estimated, small cars then will account for 16.4 percent of the anticipated car population of 71.4 million.

Motor gasoline demand is expected to increase nearly 18 percent in the next five years—from 57 billion gallons in 1959 to 67 billion in 1964—as the gasoline-powered, internal combustion engine continues to power America's passenger cars.

If we Americans are to retain our
hard-won freedom, we must strip away
false values and revive . . .



By Willard M. Wilson*

The Spirit of the Pioneers



* Mr. Wilson is secretary of the American Petroleum Institute. He was recently awarded a George Washington Honor Medal by the Freedoms Foundation at Valley Forge, Pa., for the challenging speech from which the accompanying article was adapted. The Foundation cited the speech for helping create "a better understanding of our great fundamental American traditions in their application to the everyday lives of citizens of our Republic." A lawyer by profession, Mr. Wilson served two terms as prosecuting attorney of Phelps County, Nebraska, and one term in the Nebraska State Senate, before becoming affiliated with American Petroleum Institute activities in 1950.

ONE OF THE MOST VIVID RECOLLECTIONS of my boyhood in Nebraska is of walking with my father over land that had been homesteaded by my grandfather. As we walked, my father told how my grandparents had lived for a time in a cave dug into the side of a hill. They lived there while Grandfather built a brick kiln and then laboriously made by hand enough bricks to build a house.

Then my father told of the hardships of pioneering—the heat, the cold, the blizzards, the grasshopper plagues, the prairie fires, and, of course, the constant threat of Indians on the warpath. At least once, this threat forced my grandfather and other settlers to hurry their families into wagons and flee over the prairie to the protection of Fort Kearney. But most important, they returned to the land.

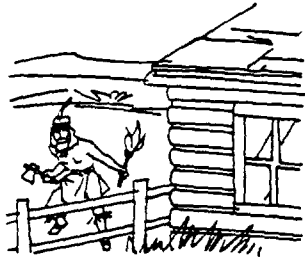
Such pioneers knew poverty; they knew hardship; and they certainly knew that freedom was not free. For them and for all American pioneers the objective was the same: a better life tomorrow, built on the bedrock of freedom today.

Exceptions to the Rule

We now live in the tomorrow that the pioneers anticipated. We enjoy the blessings of liberty that their courage and fortitude secured for us. But we are exceptions. The people in most nations have been born, have lived and have died without ever knowing liberty as we know it.

The time has come, however, when we must recapture some of the courageous spirit of the pioneers. If we don't we may not always remain exceptions to the rule—the rule of tyranny.

Now don't misunderstand me—we're proud of being Americans. We show our pride by reciting the fact that although we have less than seven



percent of the world's population, we have 54 percent of the world's telephones, 68 percent of the world's automobiles, more than two-thirds of the world's TV sets, and 92 percent of the world's bathtubs.

We have millions of this and billions of that. In fact, we have more of everything than anyone.

Doesn't that prove that America is wonderful? Doesn't that prove the American way is the best?

Does it?

Well, it may to us, but it doesn't to the rest of the world.

Pioneer Life Insecure

We need to remind ourselves again and again of the time when America set fire to the world's imagination—the time when it was being pioneered. Americans did *not* have a high standard of living then.

Pioneer life was insecure—but it was envied. It was envied because pioneer Americans had one thing even rich Europeans couldn't buy.

The Americans had freedom.

They had freedom to live as they chose, freedom to rise, freedom to achieve anything within their capabilities.

It was not telephones or radios; not luxuries or living standards; not automobiles or oil; it was freedom that pulled the great masses of Europeans to America's shores. It was an ideal—not a statistic—that stampeded Europe's population. It was our high standard of *freedom* that brought people here. Our high standard of *living* came later.

The radios and telephones, the machines, yes, even the oil wells and refineries we display are not the *cause* of this country's greatness; they are the *results*.

America's future depends not so much on her material possessions as on her freedom. The preservation of

that freedom is the responsibility of every one of us.

If we remain silent on issues fundamental to freedom and to liberty, who is going to tell the story?

You don't have to go far to hear our government lambasted from every angle, but how often do you hear about its many good points? I don't mean the government hand-outs. I mean freedom, and rights, and yes, duties, too. How much trouble is taken to show the individual his importance to the government and his country's need for his participation in public affairs?

The recruiters for Communism know how to win susceptible young men and women. They instill in them the glories of Communism. They make young people feel important to the party and the party important to them. They don't go around saying that the party is composed of rascals and dunderheads and that their leaders are incompetent. They know that isn't the way to sell Communism—or anything else for that matter.

But that's the kind of sales talk some people are using to try to sell Americanism. And then they wonder why such a great product doesn't go the way it should.

Politicians Defamed

All too often politicians are referred to as shady characters who, if they could earn an honest day's living, would never enter politics.

By and large, people in government are capable, hard working and sincere. Legislators want to do a good job. They want to do what the people want them to do. But they aren't worth a hoot as mindreaders. If you and I are too busy or too selfish to keep people in government informed on issues they must decide for us, then we can't complain.

When we show legislators, city councilmen, local tax departments, or anyone else in government how to do their jobs better, we are helping them and are also making a contribution to good government. At the same time, we are preserving freedom—the freedom we inherited in trust and which we are obligated to preserve for posterity.

In the history of other countries, we see how the people had a chance to preserve their freedom and failed to take advantage of it. Germany, for example, had it after World War I. But instead, they listened to a rabble rouser who preached a doctrine of hate and selfish pride. The Germans traded liberty for security. Some did it unwittingly; all did it gradually. But they did it nevertheless.

Bad for Business

The majority of the citizens of Germany — good people — squandered their liberty by remaining silent. They did not object because liberty was not *really* being destroyed. Limited a bit, maybe, but not destroyed. And besides, "Why get mixed up in it, it might be bad for business."

Finally, of course, the people *did* get mixed up in it—whether they wanted to or not. It turned out to be bad for business—and for everything else.

Many people, of course, say that Germany was an exception. Was it really?

Hitler only followed the pattern established by Mussolini, who heard the young men and women of Italy shout their approval when he told them, "You don't want liberty, you want jobs." To paraphrase that today would be to say, "You don't want free enterprise, you want security."

Today, we as individuals are de-

ciding what kind of a country this is going to be and what kind of a government future generations are going to have.

Will it be the kind of government the pioneers fought for and won—a government of free men ready to stand up for the principles in which they believe? Or will it sink into the mire of neglect where people take orders from the state because they were too busy or because they lacked the courage to preserve for others the freedom their ancestors passed on to them?

With our heritage we cannot be guilty of the crime of silence when good government and good public servants are being crucified.

We cannot adopt an air of neutrality when liberty is being traded for security.

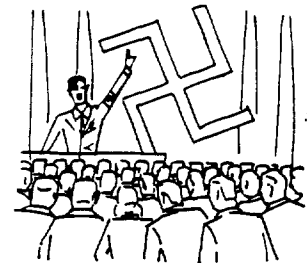
We cannot expect our system of private enterprise to survive if those of us who are the direct beneficiaries are not willing to take a firm public stand in its favor.

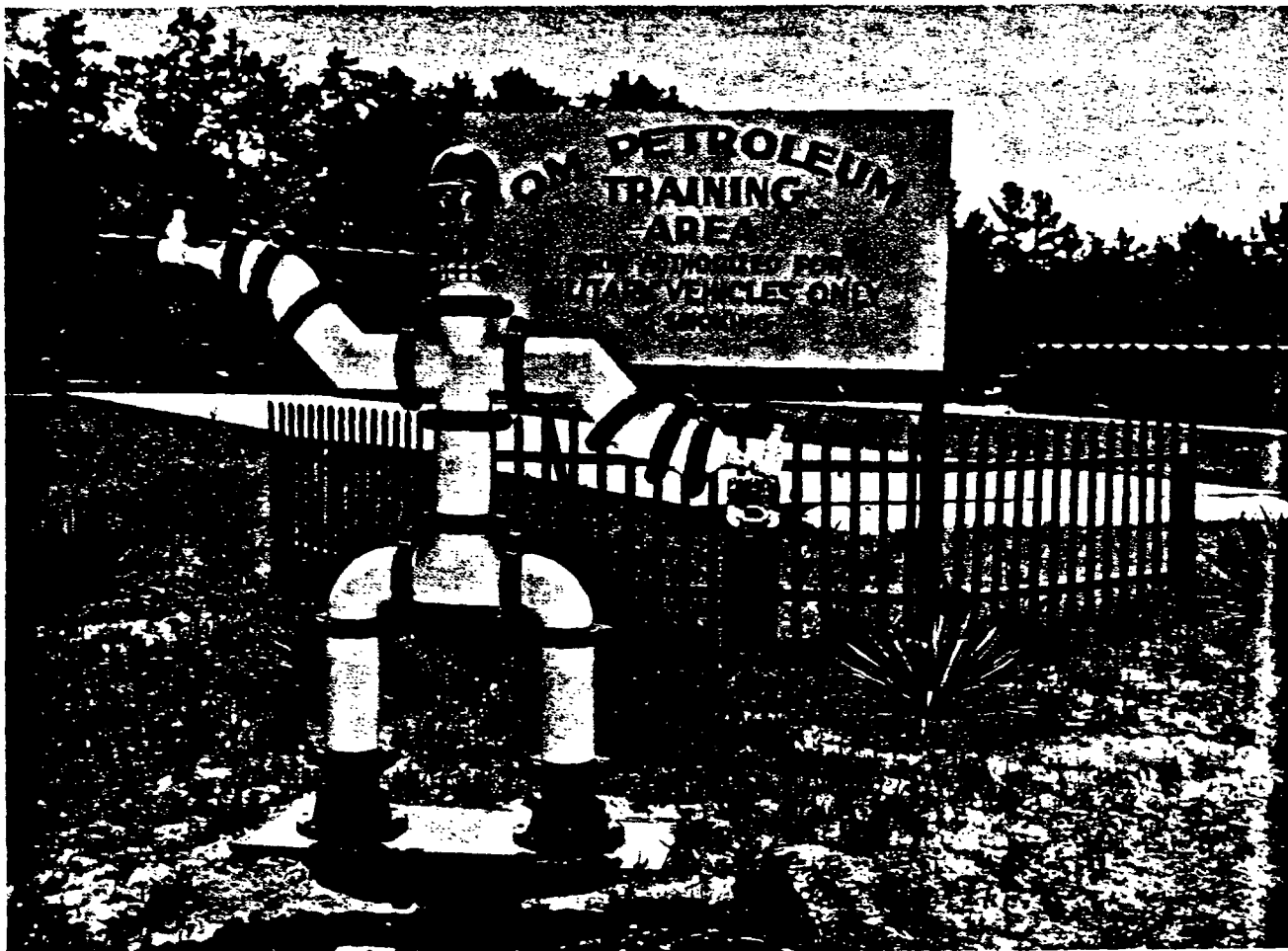
We cannot expect to retain freedom unless we have the courage of our convictions.

Finally, as one statesman has said, "We cannot afford to be good losers when what we lose is liberty."

Reaffirm Beliefs

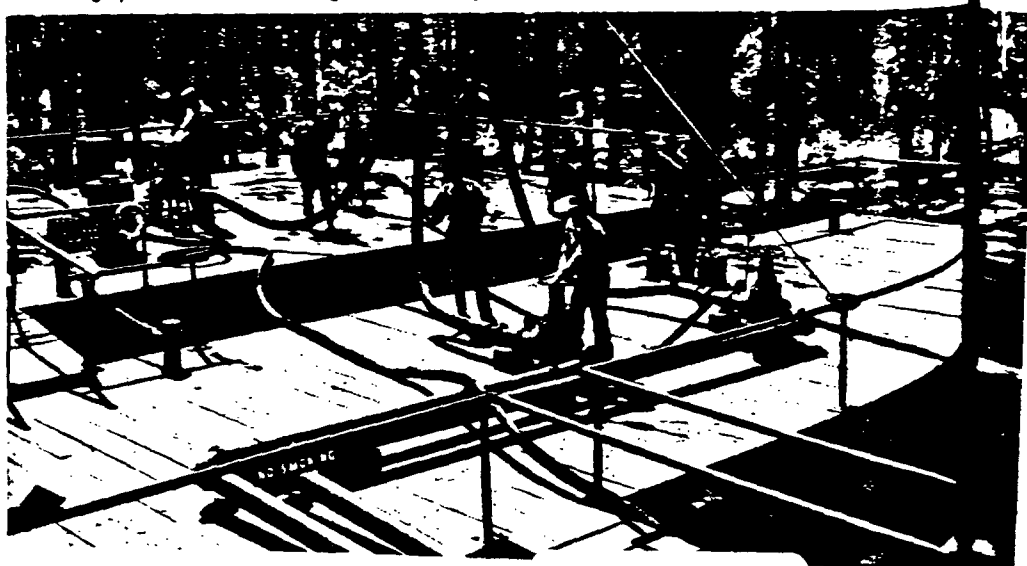
The spirit of freedom is still present in most Americans, but it is dormant in all too many cases. It must be awakened. We must strip away some of the false values that have grown up and reaffirm our belief in the basic principles of the pioneers—principles which gave them the courage to leave the security of an established home in the old country to enjoy new freedom in a new land. Courage to suffer cold, hunger and discomfort to build a better life not only for themselves but for all posterity. #





Fabricated from welded sections of pipe, clamps, valves and fittings, and sporting a helmet liner and gasoline can, Mr. POL (Petroleum Oils and Lubricants) stands guard at the entrance to the Petroleum Training Area at the Quartermaster School at Fort Lee.

This simulated tanker and dock provide military students with actual experience in unloading products and moving them through hoses, valves and pipes inland to . . .



Basic Training in Oil

Officers and men of all branches of the armed forces study petroleum testing and logistics at the Army Quartermaster School, at Fort Lee, Va.

AMONG THE OBVIOUS TRANSFORMATIONS in military machines over the last century and a half is the almost complete replacement of the army of Napoleon's day. Defense forces no longer travel on their stomachs but on the wheels, tracks and wings of petroleum-powered equipment.

In the United States, the American oil industry has an outstanding record of supplying the huge demands of the military for vital petroleum products. But it is no secret that these products are of little use to the armed forces if they aren't on hand when they are needed and in the proper quantities, grades, types and specifications.

At an outdoor training area deep in the piney woods of Fort Lee, Va., and in that Army post's pin-neat classrooms and well-equipped laboratories, armed forces personnel are being thoroughly trained in petroleum supply and logistics. They also are being taught the testing and analyzing of oil products used by the military.

They are learning how to deliver the huge gallon-ages of jet and diesel fuel, gasoline, lubricating oil, grease, and other petroleum requirements to America's defense forces throughout the world. Instruction covers the present cold war situation and actual combat conditions.

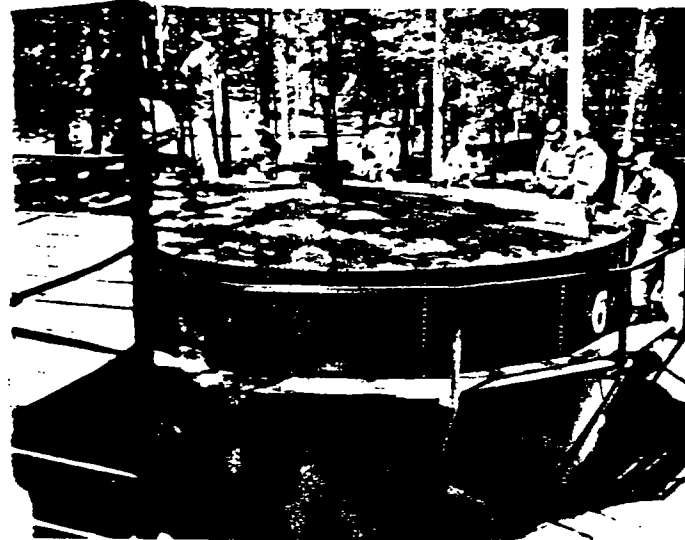
Students in the Petroleum department of the efficient Quartermaster school at Fort Lee are officers and men of the United States Army, Navy, Air Force and Marine Corps and officers from other Free World nations. They are learning about the supply, distribution, handling and testing of petroleum products for the military. They are being taught safety, measurement, analysis, storage, and pipeline, tank farm, depot and supply point operation.

Lectures, training aids, laboratory work, field trips and actual problems with realistic equipment are used in the weeks-long courses which are the most comprehensive outside the petroleum industry.

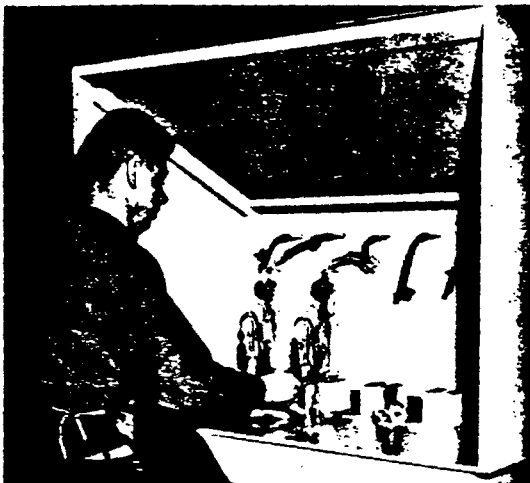
At the conclusion of their studies, officers and

storage tanks, where among other subjects, classes in tank gauging are conducted by experienced instructors.

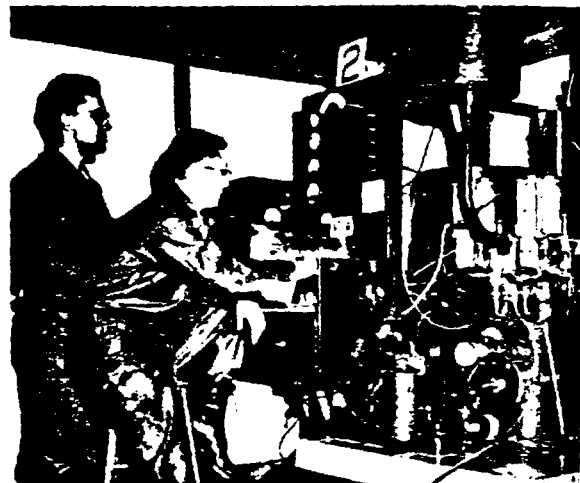
Pipeline maintenance and operation training includes the use of pigs, or scrapers, to keep lines free of deposits.



ETC 29414



Among the petroleum tests soldier-students learn to perform are those for determining sulfur content of fuels . . .



finding the octane number of gasoline through the use of standard knock-test engines, and . . .

learn
presen

non-commissioned officers are qualified for responsible positions in petroleum supply, distribution and analysis in all branches of the armed forces.

The importance of these military operations is seen in the simple fact that oil products accounted for some 65 percent of all tonnage shipped to American troops in the Korean war.

Today, graduates of the school are supervising pipeline operations in Alaska, France, Germany, Korea and Spain, testing and distributing oil to American forces in Japan, operating petroleum depots in Germany, and staffing similar installations in the Mediterranean. Wherever United States troops are stationed, petroleum experts trained at Fort Lee are helping assure them of an adequate supply of the proper types of fuels and lubricants.

Experienced Instructors

Instructors at the school are Army officers and enlisted men with training and experience in military petroleum operations. Many of the faculty members hold degrees in petroleum engineering, geology, chemistry or chemical engineering.

The present director of the Petroleum department of the Quartermaster school is Lt. Col. H. M. Farmer, of Shreveport, La., a petroleum engineering graduate of Louisiana State University. Colonel Farmer played football for LSU on Sugar Bowl

teams of the mid-1930s and worked in the oilfields of the Southwest. An Army officer since before America's entry into World War II, he has commanded military petroleum operations in this country, Europe, the Far East and the Mediterranean.

Basically, instruction in the Petroleum department is conducted in three general areas—classrooms, laboratories and the training area.

In the classrooms, the soldier-students are introduced to military petroleum operations and study such subjects as petroleum logistics, safety measures, mathematics, petroleum origin and history and types of military petroleum containers. They learn about refining and processing and many other general petroleum industry and specific military petroleum topics.

In the laboratories, they become familiar with military petroleum specifications, learn how to perform many of the standard analytical tests and are taught the significance of these tests.

Field training includes the operation of military tank farms, supply points, depots and pipelines. Complete, operating facilities make this training especially realistic. These facilities include a mock-up tanker and dock and a six-inch pipeline complete with pumping stations, teletype system and tank farms. They also embrace petroleum depots and supply points, a railroad tank car and tank trucks.



learning the amount of water and sediment present in used lubricating oils.

Supply Office in Norfolk and the Langley Air Force Base petroleum handling facilities at Hampton, Va.

Besides opening their facilities for field trips by students, oil companies provide valuable assistance by supplying training aids, literature, technical publications, laboratory samples and guest instructors. One of the lecturers is W. W. Sweeney, Ethyl Corporation field representative in Virginia. Mr. Sweeney regularly makes a presentation on tank cleaning to officers in the petroleum products supply course.

Industry Help Invaluable

"Industry help has been invaluable in making the petroleum courses successful," says Colonel Farmer, department director. "We couldn't begin to do the job we are doing without the assistance of American oil companies."

In addition to training regular armed forces personnel, the Petroleum department of the Quartermaster school provides training areas and instruction for petroleum reserve units on active duty.

In its literature branch, specialists write the training, field and technical manuals used in school instruction and in Army petroleum units everywhere.

These publications and the military personnel trained at Fort Lee are sent to strategic locations around the globe. Together they help keep the Free World's defense forces at peak operating efficiency by assuring that their equipment is well fueled, lubricated and ready to go at a moment's notice. #

drum and gasoline can reconditioning units and petroleum product dispensing equipment.

Another important phase of the courses are field trips where students study the operation of civilian and military oil installations at first hand. Through the cooperation of several oil companies in the Philadelphia area, officers in some of the more advanced courses spend several days on a guided tour of pipelines, refineries and research laboratories. They and other students also visit the U.S. Naval



Instruction also includes practice in filling collapsible storage tanks (left) and studies of filter separations (above).

back to 1831. In September of that year, a now-forgotten candidate named William Wirt was nominated for president by a minor party in this country's first national political convention, which was held in Baltimore.

By the following spring, the convention idea had seized the public's imagination. The first national Democratic convention was held in May. It nominated Andrew Jackson for a second term, and picked Martin Van Buren as his running-mate. Both were elected that fall.

In the years since then, the big party conventions have become so much a part of our political scene that few people realize they have no legal standing and are not provided for in any state or federal law. They are simply a time-honored way for each party to pick its candidates for the White House and the vice presidency.

Emotions Stirred

Historic conventions of the past have seen tempers running high and emotions stirred to fever pitch. A visitor to the Republican convention that nominated Abraham Lincoln in 1860 reported: "Five thousand people leaped to their seats, women not wanting, and the wild yell made vesper breathings of all that had preceded."

Four fist fights broke out simultaneously on the floor of the Democratic convention in Houston in 1928. At the Democrats' convention in 1952, someone tossed a lighted match into a pile of trash and started a lively blaze among the delegates.

Phrases that have become part of the language were first uttered at political conventions. It was at the Democratic convention in Chicago in 1896 that William Jennings Bryan boomed, "You shall not press down upon the brow of labor this crown of thorns. You shall not crucify mankind upon a cross of gold." At another Democratic convention 36 years later, Franklin D. Roosevelt was pledging himself to "a new deal for the American people."

The term "smoke-filled room" stems from a remark by Harry M. Daugherty, campaign manager for Senator Warren G. Harding at the Republican convention in Chicago in 1920. The deadlock over a presidential candidate would be resolved, he said, by a group of men "who will sit down about two o'clock in the morning around a table in a smoke-filled room."

Are present-day political conventions getting tamer and more sedate? Some people think they are, because television magnifies every bit of action and brings it into living rooms all over the country.

In 1948, the first time television covered a national convention, only about 400,000 homes were equipped with TV receivers. By 1956, there were 40 million sets in U. S. households. This year, it's estimated, at least 90 percent of the population will have access to a TV set at convention time.

What does this coverage mean? For one thing, it assures the viewer in his living room a far broader picture of the convention process than the delegates can get themselves. The TV cameras go places and see things that no single delegate could hope to do. The armchair conventioneer can be carried instantaneously from the convention floor to the airport to witness the arrival of an important candidate. Or he can go into a hotel suite to see the surrender of a man who thought he could win, but has been convinced he can't.

What's the procedure at formal sessions and behind the scenes at a national political convention? Here's a brief description:

The first official business is conducted by a temporary chairman, who has been picked in advance by the committee on convention arrangements. He serves for the first session or two, until permanent officers of the convention have been named. He introduces the kick-off speaker or "keynoter"—a party stalwart who praises the party's record and flays the opposition.



"Five thousand people leaped to their seats" when the Republicans nominated Abraham Lincoln in 1860.

"A MAN WHO..."

Four committees are then selected—on credentials, permanent organization, rules and order of business, and platform and resolutions. The credentials committee has the task of deciding, in case of dispute, which members of rival state delegations shall be entitled to seats on the floor.

After a permanent chairman has been named, the convention votes on a party platform which has been drafted by the platform committee.

A Guide to Convention Terms

Here are some key words and phrases you are likely to hear as the two major political parties meet this year to pick their candidates:

FAVORITE SON—A candidate nominated by his home state. Sometimes this is done to give him special recognition, sometimes to put him in the running for the vice presidential spot. Favorite sons may even have a chance for the presidential nomination if the convention is deadlocked.

CAUCUS—A private meeting of the delegates from a state to talk over strategy or agree on a position on a candidate or an issue.

PLANK—A statement of the party's position on a specific issue.

PLATFORM—A collection of planks giving the party's position on all important issues.

STAMPEDE—A sudden shift in convention balloting, when a majority of the delegates desert the candidates they have supported and rush to vote for the candidate most likely to get the nomination.

DARK HORSE—A candidate who goes into a convention with little support but suddenly develops strength enough to get the nomination. Among noteworthy "dark horses" were Polk in 1844, Pierce in 1852, Garfield in 1880 and Harding in 1920.

UNIT RULE—A requirement that all the delegates from a particular state must vote as a unit. The majority decides what the unit's position will be.

ACCLAMATION—Method of nominating a candidate who has little or no opposition, by vocal acclaim rather than by polling delegates.

By the third or fourth day, the delegates are ready to get to the true purpose of the meeting—naming and voting on the candidates for president and vice president.

The convention chairman goes down the roll of states, alphabetically. As he calls the name of each state, the chairman of its delegation (often a governor, senator or other party leader) rises, either to nominate a candidate, to pass, to second an earlier nomination, or to yield the floor to a state from which a "favorite son" comes.

Often, the mention of a candidate's name will set off a wild demonstration. People snake their way up and down the aisles, bands play, confusion reigns. All of this is a sacred part of convention procedure, and is likely to continue in years to come despite the restraining influence of television.

When the nominating and seconding have been completed, the voting begins. In both the Democratic and Republican conventions, a simple majority is sufficient for nomination.

First Ballot Nominations

About half the time, in years past, presidential candidates have been nominated on the first ballot. But if no candidate gets a majority on the first roll call, the real struggle begins. There are caucuses, promises of favors, huddles in corridors and hotel rooms. At the Democratic convention in 1924, it took 103 ballots and 10 days of voting before John W. Davis was selected as the nominee.

After a presidential candidate is picked, the convention goes about the job of nominating a vice-presidential candidate. Here, the real maneuvering is never visible. The presidential nominee sits down with party leaders; together they decide on who the best man would be to "round out the ticket."

Finally, committees of the convention are named to notify, officially, the nominees who have been selected. Since 1932, when Franklin D. Roosevelt initiated the practice, it has been customary for the presidential nominee to make a speech of acceptance. Then the convention adjourns.

Only in America are there political meetings of the turbulence, the scope and the attention-getting quality of the major parties' conventions. Despite the changes that have taken place over the years, they still reflect the vitality and the exuberance of a big and growing country. #

Chemists to Play Major Role in Solving Engine Problems

CHEMISTS WILL PLAY a major role in solving present and future problems in high-compression automotive engines, Wheeler G. Lovell of Ethyl Corporation's research laboratories, Detroit, told the Institution of Mechanical Engineers in a James Clayton Lecture, in London, early in March.



Wheeler G. Lovell

Predicting that "high-compression piston engines will continue to be built for many years to come," Mr. Lovell reviewed some of their combustion problems. These include knock at various throttle openings, pre-combustion reactions, deposit formation, surface ignition, and incomplete burning.

Dr. George Calingaert Dies



Dr. Calingaert

DR. GEORGE CALINGAERT, 63, former director of chemical research at Ethyl Corporation's Detroit Laboratories, died on April 16 in Naples, Italy.

Born and educated in Belgium, Dr. Calingaert joined Ethyl in 1926. He was an authority in the field of organometallics.

After leaving the Company in 1950, he became professor of chemistry at Hobart and William Smith Colleges in Geneva, N. Y. Dr. Calingaert was a consultant for Ethyl until his death.

Discoveries Prolong Life of Motor Oils, Tires, Plastics

CHEMICAL DISCOVERIES that will prolong the useful life of motor oils, automobile tires, plastics and many other products were described by two Ethyl Corporation scientists at the 137th national meeting of the American Chemical Society in Cleveland, in April. Addressing the



Gordon G. Knapp

Division of Petroleum Chemistry, Dr. Gordon G. Knapp and Harold D. Orloff said that many products can be better protected against deterioration as a result of powerful new antioxidants they have developed.



Harold D. Orloff

Previously, other Ethyl scientists had developed a process for making superior antioxidants out of newly-developed ortho-alkylated phenols. Then, Dr. Knapp and Mr. Orloff discovered that adding another group of chemicals—the dialkyl phosphonates—greatly increases the effectiveness of these antioxidants. In a standard engine test of motor oils, the combination antioxidant reduced the wear on bearings by 30 times.

The dialkyl phosphonates exert a strong synergistic or promoter effect on the ortho-alkylated phenols, greatly magnifying their antioxidant action. This effect varies greatly with the chemical structure of the phenolic antioxidant to which they are attached, the Ethyl scientists explained.

Aided by the new knowledge, it may now be possible to develop improved antioxidants.

Ethyl Adds to Vinyl Chloride Monomer Production Capacity

A NEW PLANT for the manufacture of vinyl chloride monomer is under construction at Ethyl Corporation's manufacturing center at Houston, Texas. When it is completed and goes into production next year, the plant will supplement the Company's vinyl chloride monomer plant at Baton Rouge, La., and provide increased supplies of this chemical intermediate for the rapidly growing plastics industry.

Ethyl produces vinyl chloride monomer by ther-

mally cracking ethylene dichloride. This yields the monomer, and hydrogen chloride as a by-product. The latter is used in the Company's anti-knock compound manufacturing operations.

Shipped by tank car, vinyl chloride monomer is subsequently converted into polyvinyl chloride, one of the most popular plastics. Polyvinyl chloride is used for wire insulation, upholstery and curtain materials, floor coverings, phonograph records, and other household and industrial products.

Viewing CARBURETOR ICECAPADES

Specially designed equipment demonstrates ice formation and behavior

A COMPACT PIECE OF EQUIPMENT designed and built by an Ethyl Corporation project engineer dramatically demonstrates how ice can form in automobile carburetors. Since little is known about the mechanics of carburetor icing or its appearance, the equipment may be helpful in broadening understanding of the subject.

Generally, it is known that icing can occur in cold engines with volatile fuels when outside temperatures are in the 30° to 55° range and relative humidity exceeds 65 per cent. Under such conditions, the moisture in incoming air sometimes freezes on carburetor throttle blades and throttle bodies. A sufficient accumulation of ice on these parts can cut off the flow of air to the engine and cause stalling.

Besides demonstrating how carburetor ice forms and what it looks like, the new Ethyl equipment can be used to determine the icing tendencies of various gasolines and to find out what, if any, type of anti-icing agent is present and approximately in what concentration.

Careful and repeated observations of the behavior of different gasoline samples in the equipment reveals that, in general, three different types of ice can form in carburetors.

Ice Sloughs Off

A gasoline with icing tendencies to which no anti-icing agent has been added forms distinct coatings of ice on the throttle. This ice continues to build up at a regular rate. Add a surface-active anti-icing agent to the same fuel and the ice appears initially to accumulate in the same manner. When it reaches a certain thickness, however, it sloughs off—the thickness depending on the amount of agent present.

A third type—a slushy ice—is formed by gasolines containing alcohol-type anti-icing additives in insufficient quantities. Eventually, depending on

the concentration, the alcohol apparently separates, passes into the engine, and leaves the ice in a solid mass on the throttle.

When alcohol-type additives are present in sufficient quantities, however, no ice forms.

The demonstration equipment which is adding to knowledge about icing consists of a standard Briggs and Stratton eight-cubic-inch engine with an electric starter, stripped of standard carburetor, fuel tank and related parts. A plastic carburetor with glass throttle body, two fuel bowls with selective valve, a plastic box to support the fuel containers, and a built-in ice tower have been added.

Seen Through Throttle Body

Gasoline samples to be used are placed in the fuel bowls. When the engine is operating, air drawn into the carburetor first passes over ice cubes placed in the tower to create constant temperature and humidity conditions. As ice forms on the throttle, it may be readily observed and studied through the glass throttle body.

The equipment was designed and built originally to demonstrate the effectiveness of "Ethyl" Multi-Purpose Additive. Used in concentrations of 50 parts per million, or about 12 pounds per thousand barrels of gasoline, this surface-active agent is effective in three ways. It prevents carburetor icing, eliminates carburetor deposits and protects engine parts, storage tanks and pipelines against corrosion.

The principle modification required to fit the demonstration equipment for more detailed icing studies consists of installing a smaller throttle body.

Although use of the equipment is in experimental stages, there are indications that with adequate correlation to full-scale automobile engine operations it may also be useful in detecting icing tendencies of gasolines and evaluating effectiveness of anti-icing additives. #

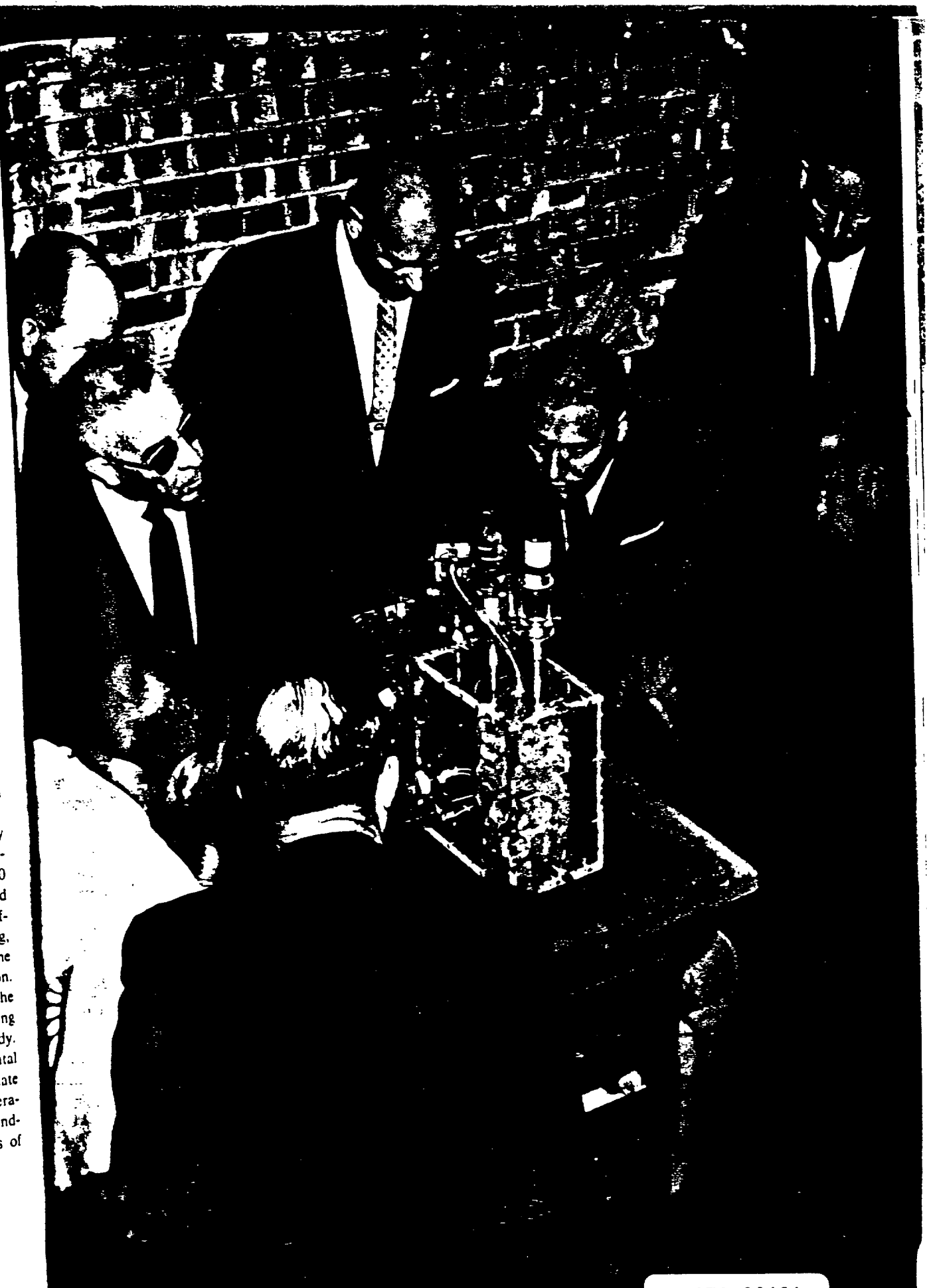
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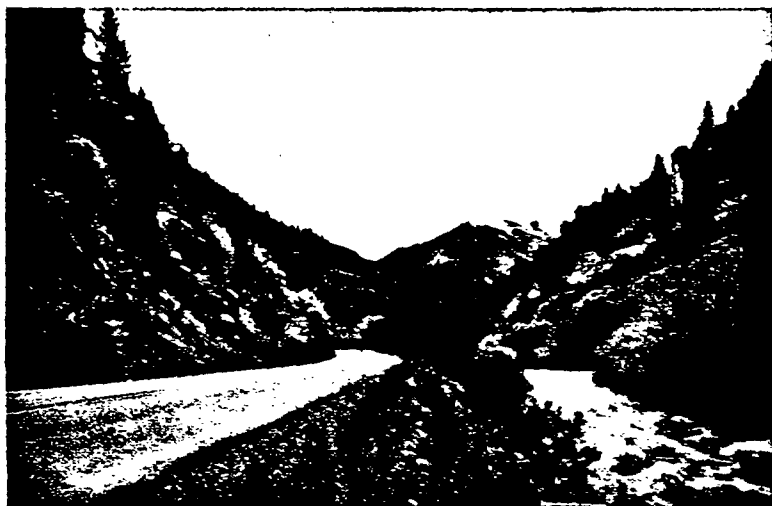
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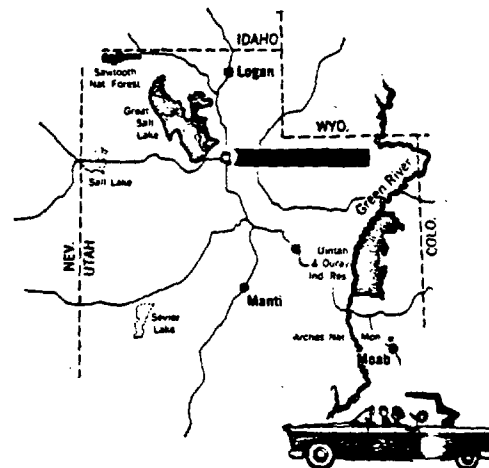
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TOP LEFT: This awesome splendor is a part of Arches National Monument near Moab, Utah. Honey-combed with these striking examples of Nature's whims of erosion, this scenic area alone is worth a Magic Circle trip by itself. MIDDLE LEFT: Logan Canyon offers a delightful combination of fishing, camp grounds and rugged scenery. BOTTOM LEFT: The majestic Mormon Temple at Manti, Utah. If you didn't recognize this Magic Circle—its the one around Salt Lake City, Utah.



Have you made a Magic Circle Trip lately?

What is a Magic Circle trip? It's a fun-filled drive in the countryside that surrounds you, wherever you live. A drive that brings you to fishing, hunting, boating, swimming . . . state forests and picnic areas . . . historic sites . . . ever-changing scenery. It's family fun at its best. And with today's new roads, Magic Circle trips are easier than ever. Just get out and go.

And right now, see if you can guess where this Magic Circle is. You'll find all the clues you need in the pictures and the map.



ETHYL CORPORATION
New York 17, N. Y.

Magic Circle advertisements are published by Ethyl Corp., to help you get more enjoyment out of your car. Ethyl makes additives used by oil companies everywhere, to improve their gasolines and your driving pleasure.

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ETC 29423

ETHYL NEWS

MAY - JUNE 1960



THE COVER scene—at Cypress Gardens, Fla.—will be repeated millions of times the country over this year. Record numbers of motorboat trailers are "Putting Keels on Wheels," as you'll read on pages 6-8. Their use increases boat owner's mobility and incidentally helps boost sales of automotive gasoline—for cars and boats.

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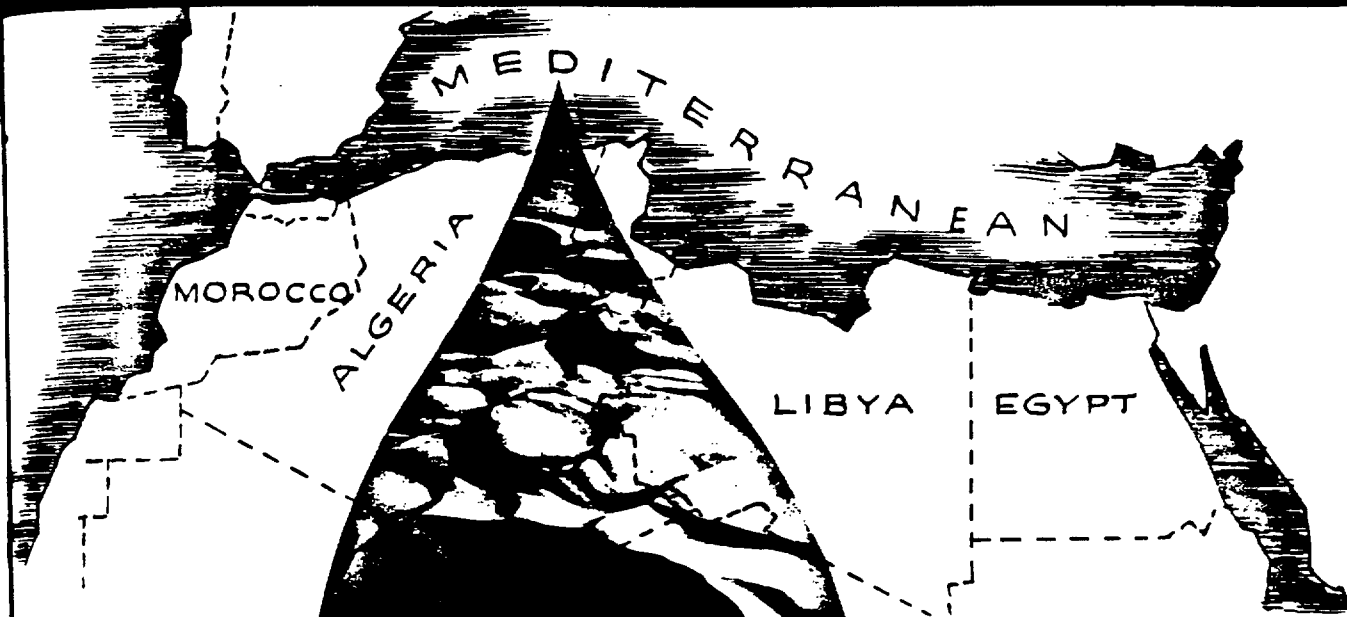
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Oil from Sahara Sands



Discoveries have come fast in North Africa, making it an important producing area

FIVE YEARS FROM NOW, according to some estimates, a million barrels of North African oil will be moving to Western European and other markets every day. That's a lot of oil from an area where, just five years ago, there was doubt that oil even existed.

But developments have come fast since the Edjele field was discovered in Algeria in 1956. In the intervening years, the vast Sahara Desert area has been transformed from an area of almost total desolation to some of the world's most sought-after real estate. Both oil and natural gas have been found in prolific quantities.

Today, practically every favorable acre from the western border of Egypt to the Atlantic Ocean is under concession. These concessions add up to hundreds of thousands of square miles, for oilmen believe that even more oil and gas will be found.

They have good reason to be optimistic. Hardly

a month goes by that a new discovery or an important extension is not reported.

What does the availability of large quantities of petroleum in North Africa mean?

First of all, of course, it provides a new source of energy for a Free World whose daily requirements are growing at a fast rate. Secondly, it provides crude petroleum and natural gas convenient to Western Europe and to the emerging countries of the African continent. At the same time, it makes Europe less dependent on Middle East oil fields. These fields are immensely productive, but also somewhat remote and within easy striking distance of the menacing paw of the Russian Bear.

Oil is not new to North Africa. It was found in Egypt more than 50 years ago, in what is now Spanish Morocco fully 40 years ago, and in Algeria more than a decade ago. But only Egypt, with a dozen fields scattered up and down the Gulf of

OIL FROM SAHARA SANDS

Suez, has production of consequence. Even that is not enough to take care of its own needs. So, as oil areas go, North Africa wasn't much.

The discovery field at Edjele was found by CREPS, one of four companies organized under the aegis of France to search for oil in the Sahara. CREPS is 65 percent owned by the French government and 35 percent by Royal Dutch Shell.

Economic Necessity

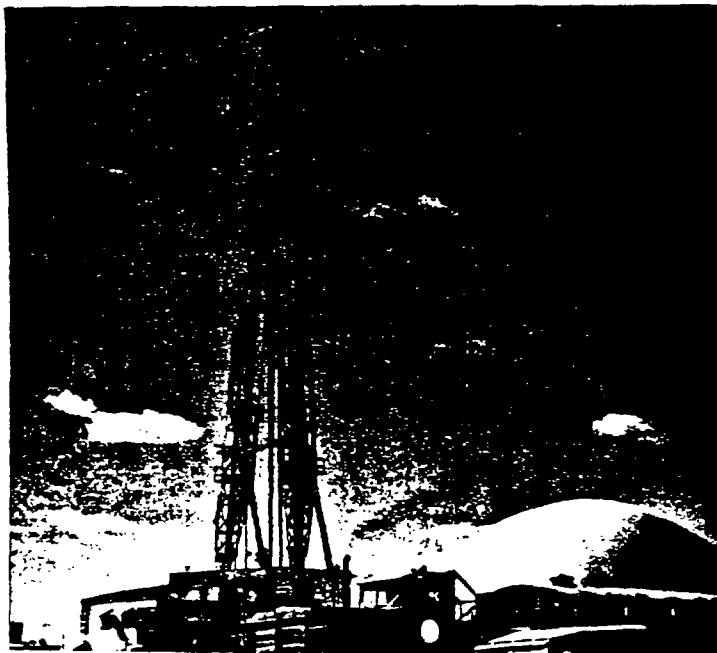
The discovery was almost an economic necessity for France. That country produces less than 40,000 barrels of oil a day, yet has a refining capacity of almost 800,000 barrels a day. Most of the oil needed to keep refineries going comes from the Middle East and Venezuela. Buying imported oil was hard on France's economy and its pride. So it set out to find oil in French territory, and explored the vast reaches of the French Sahara.

Within a year after Edjele was found in January 1956, three other major fields were discovered. One or more potentially major fields have been found each year since. Additional companies have obtained Algerian concessions, hoping for strikes.

By January 1960, Algeria had eight fields in the Sahara. Seven are oil fields. The eighth, Hassi R'mel, is among the world's largest gas fields.

Meanwhile, across the border in Libya, 20 com-

Oil drilling activity creates little oases of bustling activity in the Sahara's vast emptiness.



Since Algeria's Edjele field came in in 1956, prospectors have successfully extended the search.

panies were granted concessions covering some 250 million acres. Since then, activity has spread to Spanish Morocco and soon will probably move into western Egypt. That country plans to reopen the area between the Nile and Libya to foreign oil companies this August.

Libya's first commercial discoveries were made in 1958. Before 1959 was out, there were nine fields. Best of all, apparently, is Zelten, where the discovery well produced 17,500 barrels a day.

First of the North African fields to send oil to market was Hassi Messaoud in Algeria. For a while, a small quantity was taken out by a combined rail-and-pipeline system. But since a 415-mile, 24-inch pipeline has been completed to the Mediterranean, more than 100,000 barrels per day are now moving across the sea to France.

Another 24-inch pipeline to tap the Edjele and neighboring Saharan fields will be completed before the end of this year. It will terminate at the Tunisian port of Gabes. A third line will carry natural gas to the Mediterranean. The fourth Sahara-to-the-sea line will connect the Zelten field in eastern Libya with a port in the Gulf of Sirte.

It is possible that by 1965, when the estimated million barrels of oil a day is moving out of North Africa, that Algerian natural gas will be exported, too. The big problem is how to get it to market. It is almost 500 miles across the Mediterranean

from the northern coast of Algeria to the southern coast of France. A submarine pipeline would be an extraordinary engineering feat.

Another possibility is liquefying the gas by reducing its temperature to -258°F . and shipping it in refrigerated tankers.

The proximity of North African oil to Europe is probably its greatest asset. Next to North America, continental Western Europe is the world's largest oil market. Western European nations, excluding the United Kingdom, are capable of refining 3,000,000 barrels of oil a day.

North African oil will probably have first call on this market for several reasons. It is the closest and transportation costs are lowest. The oil producing region of Algeria is French. The oil, therefore, will be purchased in French francs or in the currency of other Common Market countries.

As African oil goes to Europe, it is expected to take over part of the market supplied from the Middle East and Venezuela. This does not mean that these areas will have to reduce production. Europe's increasing demand for oil is great enough to absorb what the Sahara is likely to produce for export for some time to come. But the new oil does give Europe more independence in selecting its source of supply.

Dwarfed by Middle East

Algeria and Libya are assuming real importance, but they are far from dominant. Discoveries in the Sahara have come so fast nobody knows just how much oil has been found. The best guess is that it adds up to between five and 10 billion barrels. That's a lot of oil, but it is dwarfed by the reserves of any one of four Middle Eastern countries—Iran, Iraq, Saudi Arabia or Kuwait.

North Africa is big in oil potential today. But spectacular as its development has been, it still will be no better than fourth or fifth among the major oil producing areas of the free world. If the USSR is included, it would drop to fifth or sixth.

Certainly, with Algeria and Libya barely scratched and with western Egypt and Morocco still untouched, it holds plenty of promise.

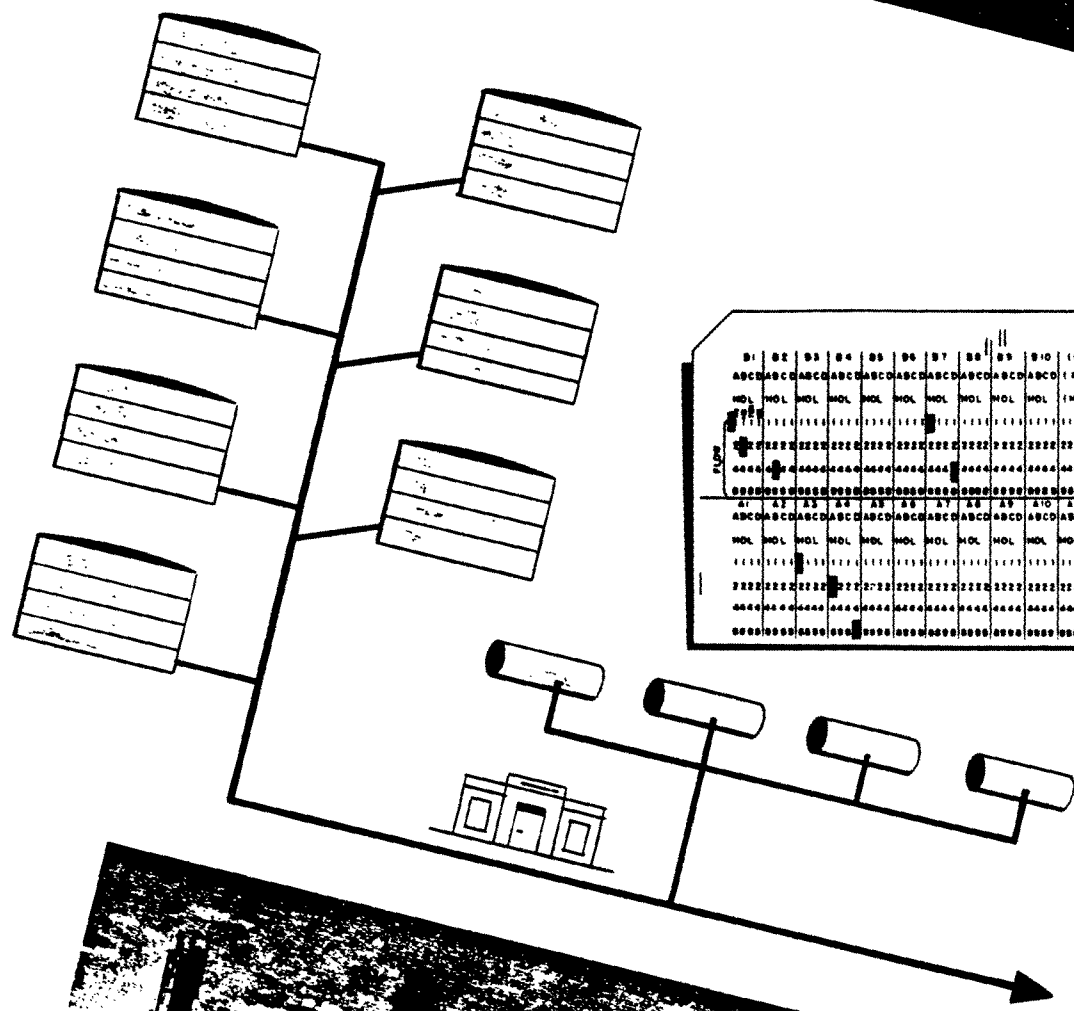
(As this issue of ETHYL NEWS went to press, it was announced that the Tunisian government had signed an agreement, calling for construction of a refinery near Sfax and granting exploration rights in the Tunisian Sahara.—THE EDITORS)#



Oil wears many faces on the once-Dark Continent. Involved in the ever-growing industry there are people from American, European and African nations.

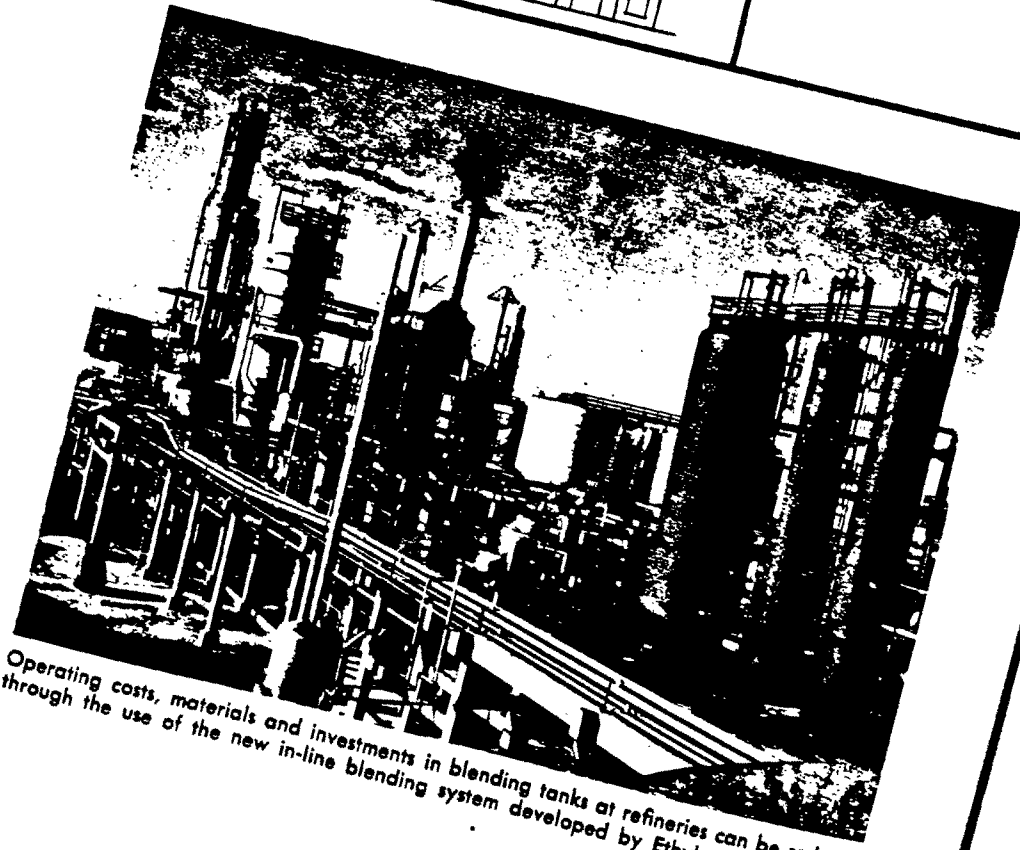
Below, the ascending charges from a pattern seismic shot plume into the air across the desert floor.





MULTI-COMPONENT BLENDING

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Operating costs, materials and investments in blending tanks at refineries can be reduced through the use of the new in-line blending system developed by Ethyl.



Proportioned with Precision

New system blends gasoline stocks and additives with pinpoint accuracy

A NEW MULTI-COMPONENT in-line blending system for refineries—that can simultaneously blend an unlimited number of different gasoline stocks and additives in precise proportions—was announced in May by Ethyl Corporation.

Developed by Ethyl, the system uses digital computer techniques especially designed for the purpose. It can blend any combination of blending stocks and additives in any desired proportions.

The new system represents a significant advance in in-line blending operations. It is simple to operate, provides pinpoint accuracy of final blends, and makes use of existing lines and tankage. Moreover, the system is highly flexible, permitting a change in blends at a moment's notice. In addition, it provides an automatic proportional cutback of all components, if the flow of any one component is restricted.

Ethyl developed the blending system as a service to the oil industry. The Company plans to make it available to refiners in the near future and to provide engineering assistance.

Effects Savings

In announcing the system, the Company pointed out that it makes possible substantial savings in capital investments in blending tanks and in materials and operating costs. In in-line blending, the finished product can go directly into a pipeline or tanker and thus bypass storage tanks.

Because of the flexibility of the new Ethyl system, it is not necessary to bring the component lines to one location or near the blending control center. The control valves and meters of the system can be several thousand feet away from the control center.

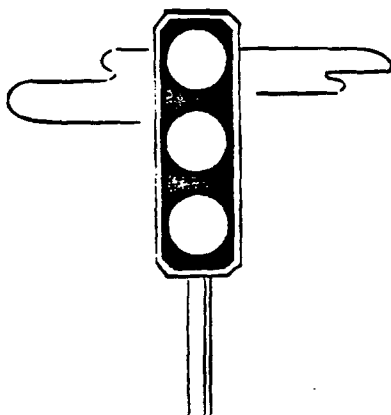
Primary parts of the system are punch-type data cards, a card reader, master control unit, component control units, flow meters and control valves. Valves regulating the flow of each component are controlled by a signal from the central control station which in turn has been activated by an electrical impulse from meters in each component's line.

Punch-Card Control

When a blending operation is to be performed, a card is punched with coded information as to the required amount and composition of the blend. This card is inserted in the card reader. The master control is then turned on and blending starts. When the desired quantity of the blend is reached, the master control automatically stops all operations. The punched card is removed from the reader, and another blend can be started quickly and easily simply by preparing and inserting another punched card.

The new Ethyl system permits much greater accuracy of finished blends and greater flexibility of uphold to tighter product specifications, refiners may erations than ever before. By making it possible to be able to lower the volume and cost of expensive components going into a blend. Moreover, if at any time during the blending operation the flow of one component is reduced below the level called for, the system automatically cuts back the flow of all other components proportionately, rather than shutting down the blending operation entirely.

Ethyl's multi-component system is to be installed at the Company's Houston manufacturing plant. When that installation is completed this fall, it will be available for inspection by refiners. #



Record numbers of motorboat trailers are . . .

Putting Keels o



Starting from home, with boat in tow, trailer owners can head for any navigable waters.

By Stanton P. Nickerson

MORE NAUTICALLY-MINDED MOTORISTS than ever before are enjoying life afloat this year. They belong to the rapidly increasing coterie who own boat trailers and therefore can reach navigable waters almost as easily as shore residents.

Such flexibility, once unknown in the boating world, is the chief advantage a trailer gives the man who has one. Without it, he would have to use conventional moorings and sail only where his boat could go under its own power.

Depending only upon his interests or skills, the boat-trailer owner can go water skiing, troll where the big ones are biting best, dive for specimens of marine life or relax in the sun. The number and variety of diversions associated with boating—well known to those who enjoy the lift and surge of waves—are being extended even further.

To some extent, boats on trailers behind auto-

mobiles are lengthening the arcs of Ethyl Corporation's "Magic Circle" campaign to increase pleasure driving. Such trips can be extended to good boating waters, with more land mileage accumulated as well as enjoyment afloat.

Deceptively simple in appearance, a typical boat trailer consists basically of a welded steel platform or cradle on which a boat rides. It is designed in A-frame, T-frame or other appropriate form for lightweight strength. A cradle-tilting device with built-in rollers helps expedite launchings and re-loadings. So do winches.

To avoid boat damage in transit, the better trailers have protective padding, coil springs and shock absorbers. Other features include pneumatic tires, brakes, direction signals and wheels with roller bearings sealed against water.

Lighter and smaller craft can be transported easily on trailers with two wheels, but four-wheel models are usually needed for heavier boats up to about 20 to 22 feet overall. Although boats exceeding 24 to 26 feet and weighing more than 5,000 pounds are seldom trailer passengers, owners of some heavy cruisers do succeed in becoming amphibious. They use de luxe trailers equipped with built-in hydraulic power lifts that lower and raise boats to and from the water mechanically.

Progress Evident

Today's models are a far cry from the first boat "trailers" of yesteryear, which were merely carriages or wagons stripped down to their frames and wheels. They were used only for taking boats between winter storage sheds and the water. Trips seldom exceeded a few hundred yards.

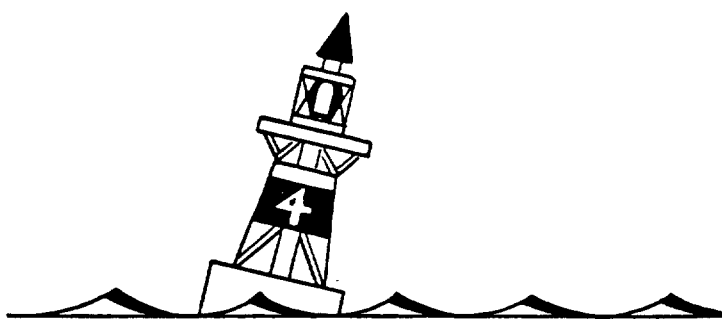
The automobile, however, added wheels to keels during the 1920's, when trailers especially designed and built to handle boats were introduced. After slowly winning acceptance as they improved, their

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Recent boat trailer innovations include lightweight models for use with compact and foreign cars. No matter what the boat or car type, owners find service stations well equipped to supply their needs.



numbers increased along with the automotive population, until more factory-built types were in use than homemade ones. This trend is continuing.

In response to the phenomenal public interest in boating during recent years, trailer companies have been doubling and redoubling production, as well as introducing new models with special features. A sturdy, light-weight carrier is available this year, for example, for towing boats behind compact cars.

In the decade since 1949, trailer sales have jumped from less than 10,000 annually to 175,000 last year, according to the National Association of Engine and Boat Manufacturers. At the start of the 1960 boating season, there were 1,750,000 in use.

Of the nation's six million owners of outboard motors, three out of four have trailers. This is largely because most craft using outboard power are light and therefore easy to transport. Some inboard types, however, also travel by trailer frequently. Only small sailboats normally move over roads.

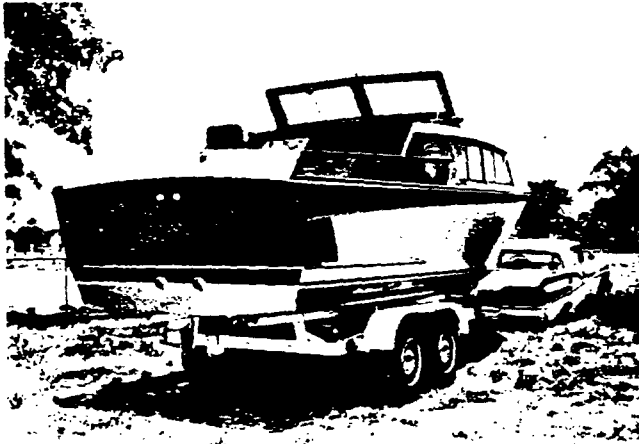
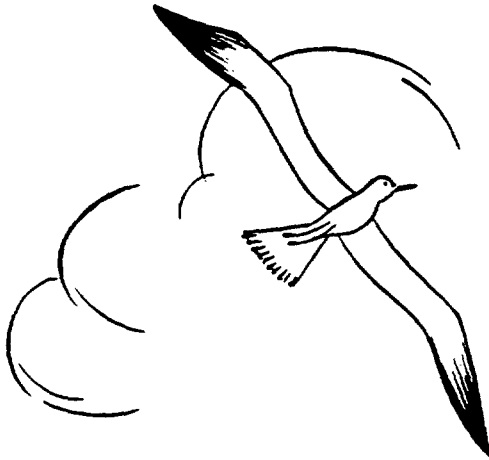
As most oilmen are aware, recreational power boating is becoming an increasingly important market for petroleum products. Some 39 million people spent leisure time afloat last year and invested well over \$2 billion to buy, operate and maintain pleasure boats of all kinds.

Nearly half a billion gallons of gasoline were consumed by such craft in 1959, including some 136 million gallons by outboard motorboats and

ETC 29431

Built-in mechanical devices enable nautically-minded motorists to launch craft with ease.





Four-wheel trailers of added strength and size are used for larger and heavier types of boats.

PUTTING KEELS ON WHEELS

over 154 million gallons by inboards. Proportionate amounts of oils, greases and related petroleum products were also used.

Because the once dominant "marine white" gasolines are no longer essential for the operation of modern marine engines, boat owners are depending more and more upon standard motor fuels. (See "More Power Afloat," ETHYL NEWS, March-April 1956.)

Motorists with boats in tow find it easy and convenient to stop at highway service stations en route to launching sites. They can fill their automobile tanks and buy gasoline for their marine engines at the same time. Lubrication, service and other needs can be handled too. Many dealers on approaches to waters frequented by trailer customers cater to boat owners.

Record Season Ahead

Judging by all 1960 barometers, such as record attendance at midwinter motor boat shows, stepped up production by engine and boat manufacturers, the construction of new waterfront marinas and yacht club membership growth, boating this season will outdo even its own recent doubling and redoubling in popularity.

In the light of these trends, trailer manufacturers expect an increase of 20 to 30 percent in sales by fall, with commensurate mobility and enjoyment for still more millions of people. #

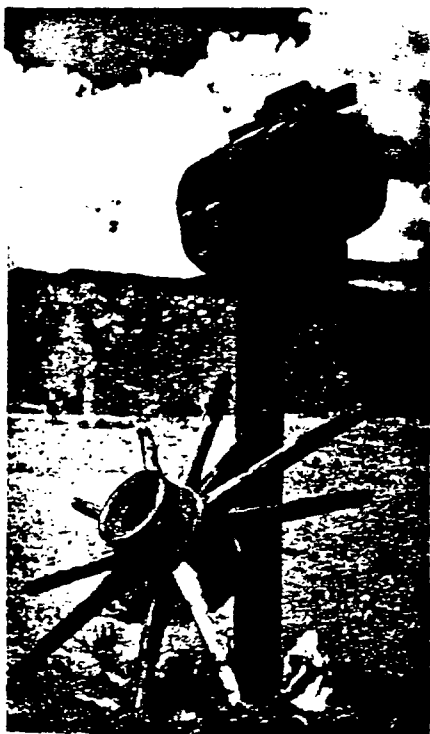


Ultimate destination for boat owners, of course, are the sparkling waters of rivers, lakes and seas. Trailers give them a wide choice.

MAILBOXES on PARADE

American ingenuity is being used to dress up postal posts
along rural roads throughout the country

By Jack B. Kemmerer



This wooden water keg mailbox enclosure is a refreshing sight in arid New Mexico.

ALMOST AS COMMON as automobiles and trucks along the roads and highways of rural America—and lots older historically—are mailboxes. At country crossroads, at the turn-offs of unpaved lanes, in farmhouse dooryards, and in many another bucolic spot, individual depositories for the postman's letters and parcels dot the landscape.

Nor are these stopping places along rural mail routes disappearing bits of Americana. In a recent year 155,639 additional families were added to rural mail delivery services by extension of existing routes or establishment of new ones. Now it takes some 31,000 carriers to deliver mail to the more than nine million families living on 1,615,994 miles of country roads.

Like so many other things down on the farm, rural mailboxes "ain't what they used to be." As their number increases, so apparently does their elaborateness. Fancy boxes and decorative supporting posts have blossomed along hundreds of routes. Postal authorities attribute the trend, in part at least, to the fact that so many former city dwellers are moving further from town—with the advent of bet-

MAILBOXES ON PARADE

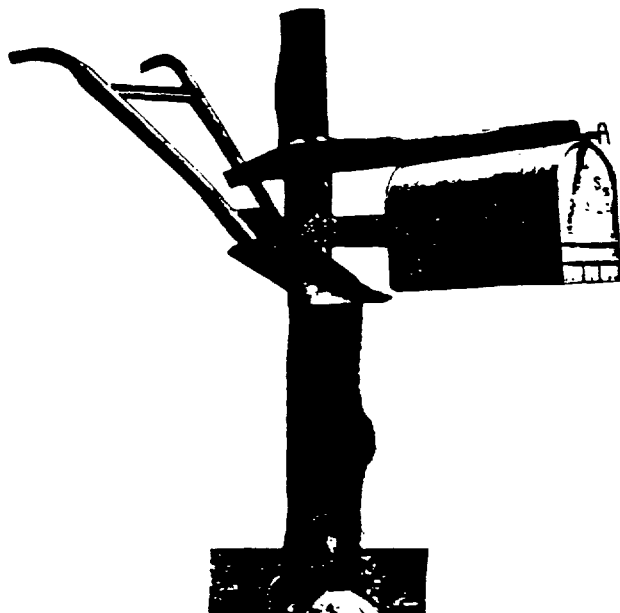
ter roads and constantly improving motorized transportation.

For several years after rural free delivery was first authorized on a trial basis by Congress in 1896, almost anything served as mailboxes—tin cans, cigar and soap boxes, and even upended pieces of drainage pipe and odd lengths of stove pipe. This free-for-all prompted the Post Office Department to establish standard requirements to which all rural mailboxes must conform. Sample boxes submitted by 16 different manufacturers have been approved, or if the rural resident prefers, he can construct his own—according to specifications available from the assistant postmaster general.

Few objections have been raised by the government to the rash of fancy mailboxes and posts, since most of them are merely housings and supports for regulation boxes. The pictures on these pages show a few of the samples of mailbox ingenuity among the millions across the land.



A touch of old New Orleans is seen in the iron grill work covering this Arkansas box.



Displaced from the field by a tractor-driven model, this horse-drawn plow has found use as an unusual postal post ornament.



M. M. Reese, east of Parsons, Kan., used welded chain to form the family initial.

Reminiscent of the auto parade that has passed by, is this three-ring post made of wire wheels popular on the cars of the early 1930s.

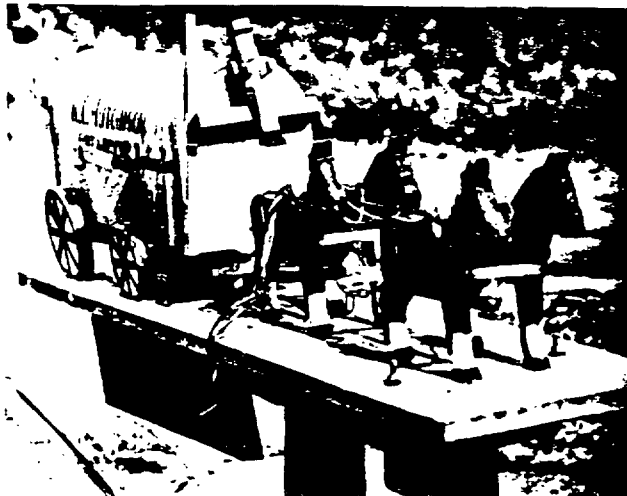


The red, white and blue figure of Uncle Sam is widely used as a mailbox holder throughout the country.

Welded in a raised position, this pump handle never gets tired of supporting a box alongside state highway No. 1, east of Sallisaw, Okla.



Though the driver has lost his grip on the reins, the horses never run away with this mailbox-turned-prairie-wagon.



No matter what their embellishments, rural mailboxes are a daily stopping place for thousands of postmen. Here, a special right-hand-drive vehicle is used to aid the deliverer in "the swift completion of his appointed rounds."

ETC 29435

Outwardly, many cars appear to be identical,
but when it comes to octane requirements . . .

There's a Big Difference

OF THE MILLIONS OF CARS that drive up to service station pump islands every day for gasoline, thousands appear to be identical. And yet, when it comes to octane requirement—the octane quality of gasoline necessary to prevent knocking—they vary quite widely.

Even among new models there are differences. In some cases, a few of those that were designed

to use premium can operate satisfactorily on regular. A number of the cars whose engines were built for regular require premium for best performance.

On the average, the octane number required to satisfy the lowest 10 percent of the cars of a given model averages about eight octane numbers below the level required to satisfy 95 percent of them. This spread between the 10 and 95 percent points was as low as 4.9 and as high as 13.4 units among the various 1958 models, one study showed.

What causes the differences? Why should two seemingly identical engines have such different appetites for octane number? There are a number of reasons; some caused by slight unavoidable variations in engine manufacturing and others resulting from car use.

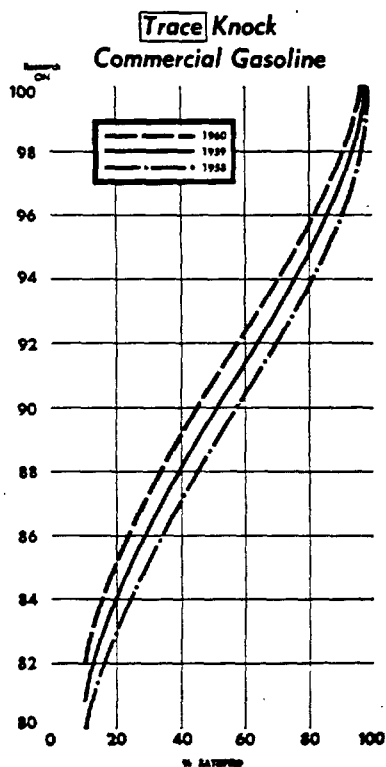
Before discussing these reasons, it might be helpful to see how designers establish the octane requirements for engines.

First, of course, they decide whether the engine is to be designed for premium or regular grade gasoline. This depends on whether it is for an "economy" car with lower compression ratio or for a more powerful, higher compression ratio use. They then take into consideration octane quality of gasolines available at service stations throughout the country.

With this information at hand, designers take maximum advantage of the octane number of the grade for which the engine is to be recommended.

Pilot models of new engines are tested in the laboratory and on the road under all sorts of driving conditions. Minor adjustments are made to bring them into line with the quality of the fuel they are to use.

**OCTANE REQUIREMENTS
ALL CARS ON ROAD AT YEAR END**



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Small variations in engine manufacture can contribute to differences in octane requirements.

ASSEMBLY OF ENGINES

Casting

When the engines are in production and blocks are being cast, there are sometimes small, unavoidable shifts in positioning the pattern. These shifts can cause variations in the thickness of cylinder walls and in coolant passages. Localized temperature increases will most likely occur as a result, raising the octane requirement.

Tolerances

Despite the extreme preciseness with which engine parts are machined and assembled, tolerances slightly in excess of the automobile industry's rigid standards sometimes occur. In rare cases, they can make compression ratios as much as 0.3 unit higher or 0.23 unit lower than the average. The difference in octane requirement between these limits is slightly more than two units.

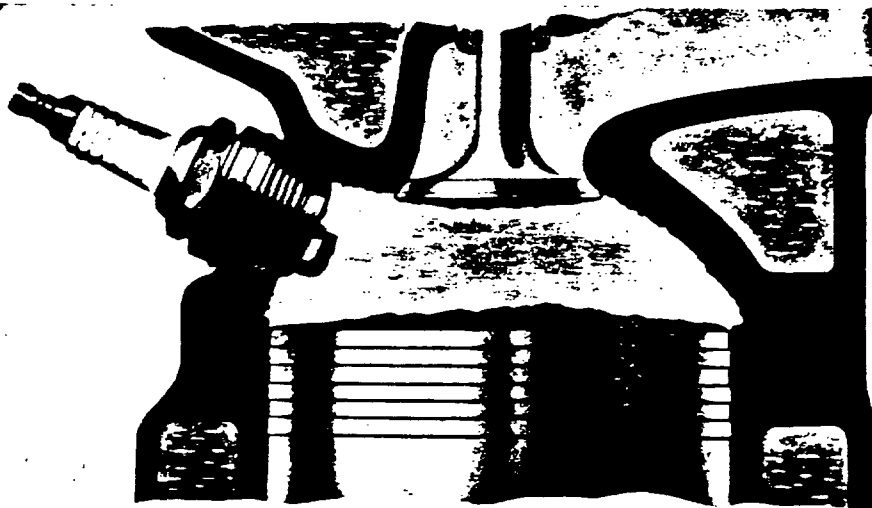
Carburetion

Since it is known that a richer or leaner fuel-air mixture affects knock, it would be expected that a minute variation in the size of carburetor jets also would influence octane requirement. Actually, however, the effect is negligible.

During acceleration, where most knocking takes place, distribution of fuel to the various cylinders is uneven. The cylinder(s) which does knock is receiving a mixture of fuel and air which is prone to knock.

If the mixture is richened at the carburetor, the knocking cylinder probably will become quiet, but the mixture in some other cylinder, previously too lean to knock, may be brought into the knocking range. Thus, small adjustments to the carburetor to control knocking are usually ineffective and do little except reduce fuel economy.

Combustion chamber deposits can cause increases in octane requirements in two ways—by reducing clearance space above pistons and thus raising compression ratio, and by increasing operating temperatures.



Ignition Timing

No single factor has more effect on octane requirement than ignition timing, or spark advance. Spark advance is accommodated to the many speed and load combinations to which an engine is subjected by two mechanisms in the distributor—speed by the centrifugal advance and load by the vacuum-controlled advance. The two work cooperatively.

Assuming that the basic timing is set precisely where it should be, manufacturing tolerances call for the spark to arrive at cylinders on very exact schedule, accurate to thousandths of a second. When all of the complex mechanical elements involved are considered, the possibility for slight malfunction is enormous. In addition, despite extreme accuracy of fabrication that would do justice to a finely made watch, there occasionally are slight differences from unit to unit in the lobes of the distributor cam.

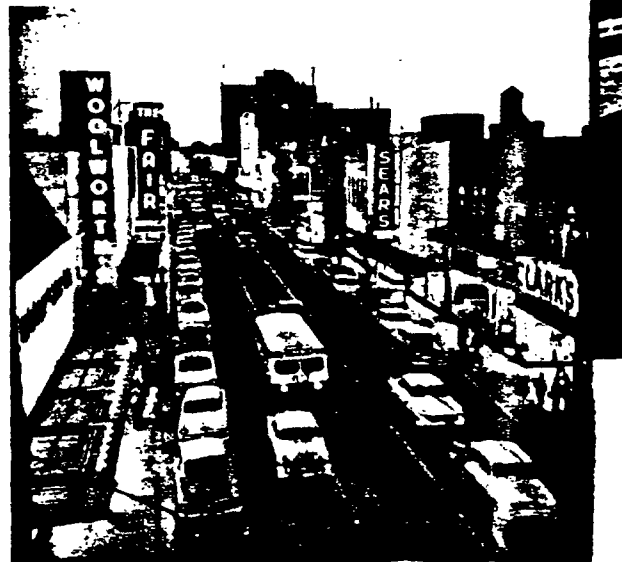
These differences, minute as they are, will produce a variation in spark timing to individual cylinders. Thus, when the spark timing in one cylinder is accurate, it is possible that some other cylinder is receiving its spark ahead of schedule. This can cause an increase in octane requirement, especially if the cylinder in question receives a fuel-air mixture that is prone to knock.

ENGINES IN USE

The large majority of new cars, just purchased, require the grade of gasoline recommended by the manufacturer. There are some, however, for the reasons already mentioned, that are exceptions. As all new cars accumulate mileage, however, their octane requirement increases, rapidly at first, and then more slowly until it levels off. In some cars, this increase calls for premium instead of regular grade, and in others, super premium rather than premium. The reasons for the increases that occur in service are less complicated than those caused by slight, unavoidable assembly line variations.

Deposits

Combustion chamber deposits (often referred to as "carbon") accumulate in new engines. After a time—usually 3,000 to 6,000 miles—they level off as older deposits break away and are expelled through the exhaust system as fast as new ones



form. These deposits can increase octane requirements by from four to ten numbers.

They cause these increases in two ways. First, they raise the compression ratio by reducing the clearance space above pistons and thus cause the fuel-air mixture to be compressed more than when the engine was new. Secondly, because of their poor heat transfer characteristics, they reach a fairly high temperature themselves and interfere with the water jacket's ability to cool the combustion chamber. The increased temperatures increase knocking tendencies.

Variations in deposit accumulation are caused by the combination of gasoline and oil used and the type of driving to which the car is subjected. Since oil contributes more to the formation of deposits than gasoline, care in its selection is important.

When it comes to driving, it has been found that low-speed, stop-and-go, intermittent driving builds up large quantities of relatively soft deposits. Higher speeds, on longer trips, produce smaller quantities of harder, smoother deposits which have less effect on octane requirement.

Thus, two cars that may have identical octane requirements when new, may end up with quite different requirements because of the gasoline-oil combination used and the type of driving under which their mileage was accumulated.



Stop-and-go urban driving (left) tends to cause larger quantities of deposits to accumulate than do higher speeds normally encountered on longer trips (above).

Spark Advance

As previously discussed, ignition timing can have a profound effect on octane requirement. However, care should be taken in retarding ignition timing to solve knocking complaints since a given change in timing has more effect on road-load fuel economy than on full-throttle power. Car manufacturers set spark advance to represent the best possible compromise between octane requirement and fuel economy. Much of a retard may therefore cost more in terms of cents per mile to the motorist because of poorer fuel economy than is warranted.

Coolant Temperature

In general, a temperature increase in any part of an engine contributes to an increase in octane requirement. The use of a thermostat that opens

at 180°F. produces slightly higher octane requirement than one which opens at 160°F. The difference, however, is not more than the day-to-day variation in knocking caused by changes in atmospheric temperature, pressure and humidity. Further, the use of low-temperature-opening thermostats is not recommended since the small gain from a slightly lowered octane requirement is offset by associated disadvantages. In a cooler engine, there is more chance for oil to sludge, corrosion to occur, and a tendency toward poorer fuel economy because of poorer fuel distribution and higher crankcase oil viscosity. The latter increases engine friction and prevents the fuel from doing more useful work.

A glycol solution, used to prevent freezing of cooling system water in winter, reaches a higher temperature than water under a given set of conditions and also may cause an increase in requirement of one or two octane numbers. This is one reason why draining it from the cooling system in warmer weather is recommended.

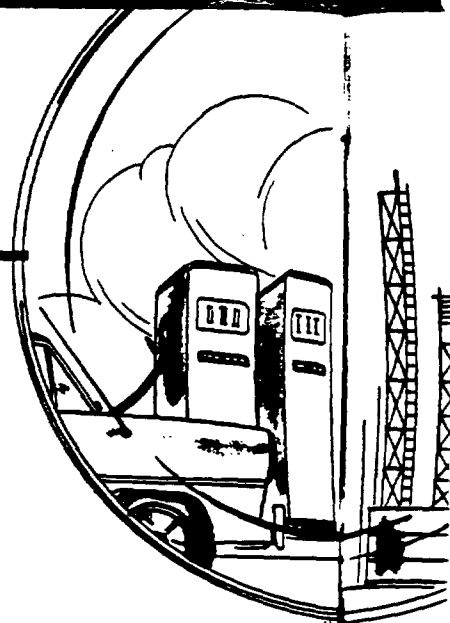
The selection of lubricating oil is an important factor in controlling deposit formation.

IN CONCLUSION

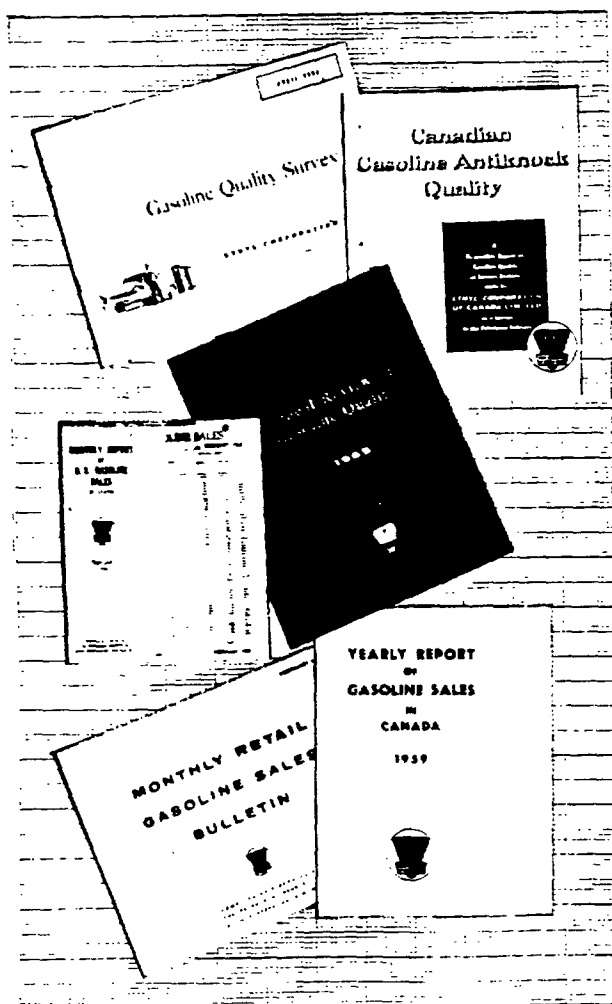
When all of the factors—both assembly line and operational—that can affect octane requirements are considered, it appears remarkable that variations are not much greater than they actually are. It is rare, however, when all or even most of the variables point in the same direction. In those cars where they do, there will be a much lower or higher octane requirement than is normally expected. It is hoped that this discussion will help explain why. #



GASOLINE— How Much and How Good



Ethyl supplies industry with timely information on motor fuel sales and quality



NEW YORK, MAY 31 — Gasoline on sale at service stations in May showed national weighted averages of 99.4 octane number (Research) for premium and 92.5 octane number (Research) for regular, according to the latest monthly survey of anti-knock quality compiled by Ethyl Corporation . . .

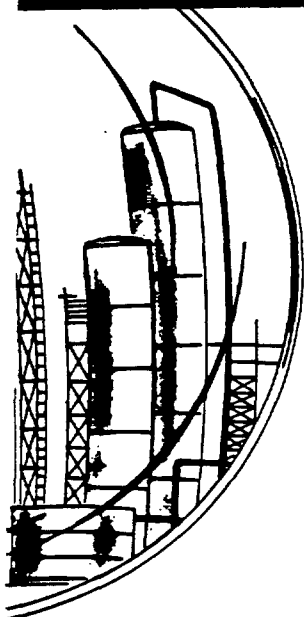
Informative articles starting like this attract wide reader interest as they appear regularly in oil publications throughout the country. Based on Ethyl's monthly Gasoline Quality Survey, they underscore the reliability, acceptance and value of the Survey and the Company's other unique market research services to the petroleum industry.

Besides the Quality Survey, Ethyl's market research services include two other monthly publications—a Report of U. S. Gasoline Sales by States and a Retail Gasoline Sales Bulletin. In addition, there are an Annual Review of Gasoline Quality, a Yearly Report of Gasoline Sales by States, special studies, and cooperation with the API Marketing Research Committee and with authors of technical papers and special articles.

United States oil companies use Ethyl market research services extensively as they concentrate on selling increased quantities of refined products. In Canada, too, oilmen find similar Ethyl Corporation of Canada publications especially helpful.

Best known of the publications, perhaps, is the

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monthly Gasoline Quality Survey. Presenting data on more than 1,000 service station samples tested in Ethyl's five strategically-located gasoline testing laboratories, it is a timely authoritative report. Its up-to-date information in easy-to-read form is widely used in sales, manufacturing and research. And its ready availability enables many companies to eliminate some of their own laboratory testing—with consequent savings in time and money.

The Quality Survey reports the research and motor octane numbers and tetraethyl lead content of premium and regular grade gasoline on a national basis and individually for 57 major marketing centers. Current situations and trends in antiknock quality are clearly portrayed. For the United States as a whole, current figures are accompanied by monthly averages for the two previous years. For the marketing centers, present and preceding 12-month data are given.

The Survey also reports motor and research octane number and TEL content of super premium gasoline samples obtained in 27 cities.

Yearly Compilation Supplied

A yearly compilation of information is concisely supplied in the Annual Review of Gasoline Quality. This bound volume is packed full of comprehensive data on octane numbers, hydrocarbon composition, volatility and other characteristics.

The Annual Review also discusses calculated road antiknock performance of gasolines and octane requirements of late model passenger cars. It reports gasoline quality trends in the United States, presents figures on gasoline in Canada, and includes year-end

octane values in more than 20 foreign countries. A final section of the book lists annual values of octane number, sensitivity, vapor pressure and distillation back to the 1930s.

With the national monthly thirst for motor gasoline nudging the 4.5 billion gallon mark, reliable reports of quantity as well as quality are essential. Ethyl's monthly Report of U. S. Gasoline Sales by States and the Monthly Retail Gasoline Sales Bulletin—made possible by the willingness of individual oil companies to supply confidential sales data—help fill this need.

The Report of Sales by States—now including Alaska and Hawaii—has been published for more than 25 years. It is based on sales by refining companies and is compiled by Ethyl from figures supplied by the refiners. It is the only report that gives a breakdown of the motor gasoline market by grade and is the first report published on a given month's sales. A special section reports sales of aviation gasoline and turbine fuels for non-military uses.

Helps Measure Performance

Oil companies find the Monthly Report—and the Yearly Report of Gasoline Sales by States which compiles, summarizes and totals monthly figures—particularly helpful in measuring their own sales performance against the overall picture.

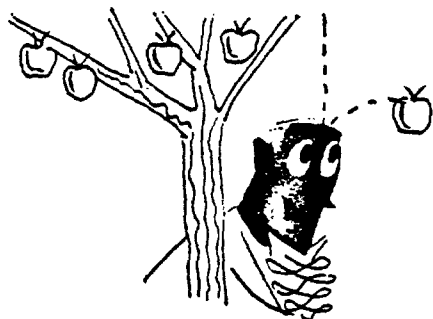
Ethyl started the Monthly Retail Gasoline Sales Bulletin three and a half years ago to help define segments of the gasoline market. The publication covers 117 concentrated markets across the United States—markets that include 68 percent of the population and which accounted for 85 percent of the population growth since 1950.

Each Monthly Bulletin shows, for each area, gasoline gallonage sales figures, the percent of premium, the number of retail gasoline outlets responsible for the gallonage and the number of oil companies reporting. Comparisons with the year previous are shown on a single-month basis and cumulatively for the year to date as percent changes. Currently, figures are based on over 93,000 retail outlets.

Combined, the unique Ethyl services provide refiners and marketers with detailed information on gasoline sales and quality. They are widely used by individual companies to compare their performance with industry averages and totals, to study trends, and to obtain an overall picture, as oilmen concentrate on marketing and sales analysis. #

Earth-shaking developments—in politics, business, industry, science, medicine, government and everyday affairs—have resulted from . . .

TREMENDOUS T



By Frank L. Remington

SIR ISAAC NEWTON saw an apple fall from a tree, and formulated the theory of gravitation.

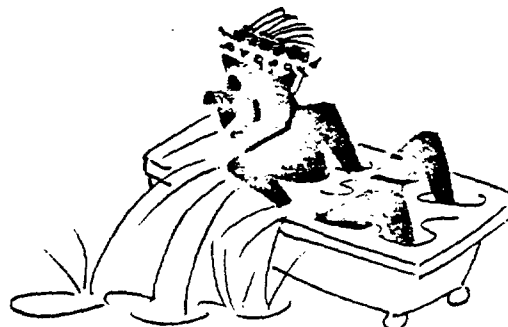
Archimedes stepped into a bathtub and, seeing the water overflow, cried "Eureka!" He knew he had discovered the principle of displacement.

Galileo watched the swinging of a chandelier, and produced the pendulum.

James Watt observed the bouncing lid of a tea-kettle, and made the first steam engine.

The pages of history are replete with such happenings. Thomas A. Edison, for one, recognized their importance. In answer to a question about his attention to seemingly inconsequential details, he replied: "There is nothing in life so small that we can afford to overlook it. Today's most trivial event may shape the destiny of ten thousand to-morrows."

Edison realized that many earth-shaking events—in politics, business, industry, science, medicine, government and everyday affairs—had their origin in apparent trivialities.



In this presidential election year, it's timely to recall an occurrence of a century ago.

At the Republican convention of 1860, it was a foregone conclusion that William H. Seward would be nominated for president. When the delegates were ready to vote, however, the printer had not yet delivered the tally sheets. Confident of victory, the Seward forces agreed to adjourn until the next day.

During the night, the opposition—previously scattered among various candidates—was rallied around one man. The following day, Abraham



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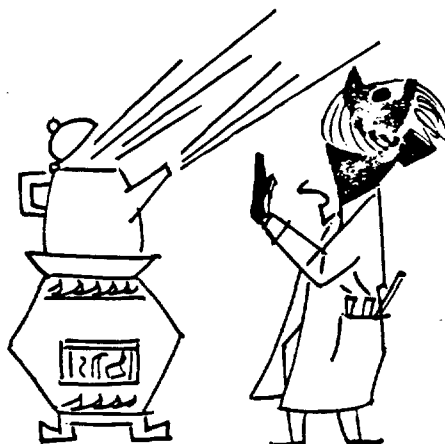
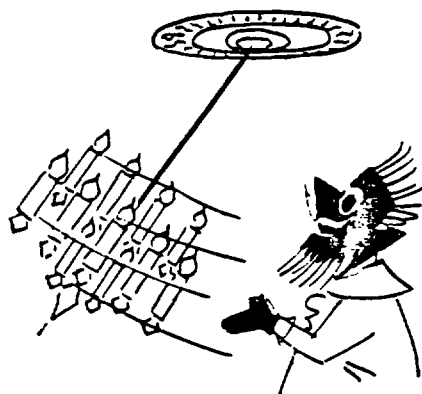
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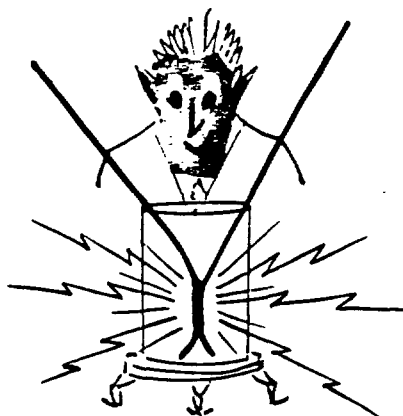


times without incident, brought a new result. Two primary wires which came into contact, fused, and electric welding, a multi-million-dollar industrial process, was invented.

One day Alfred Nobel noticed that nitroglycerin leaking from a damaged can hardened into a solid mass with the sand on which it fell. This chance observation led to the invention of dynamite.

A man picked up a hairpin and absently twisted it between his fingers. Suddenly he realized he had something. And he did—the first paper clip.

A Boston teacher watching his pupils drink from a common dipper hanging on the school pump worried that the youngsters might spread disease germs. He suggested that single-service cups could be fashioned by rolling paper into cornucopias. The paper drinking cup had been born.



ETC 29443

TREMENDOUS TRIFLES

The far-reaching consequences of little things is nowhere more apparent than in the automotive industry.

One night Charles E. Duryea, waiting to leave for the theatre, sat impatiently watching his wife spray herself with perfume. Suddenly he sat bolt upright. "Why can't gasoline be atomized into the cylinders of an automobile engine?" His wife's atomizer led to the development of the first practical carburetor.

Rubber tires, too, are the result of a tremendous trifle.

One day a piece of sulphur-treated rubber inadvertently fell from Charles Goodyear's hand onto a hot stove. When he examined the rubber later, he found it hard and tough. With this hint to guide him, Goodyear developed the vulcanizing process which made automobile tires and myriad other rubber products a practical reality.

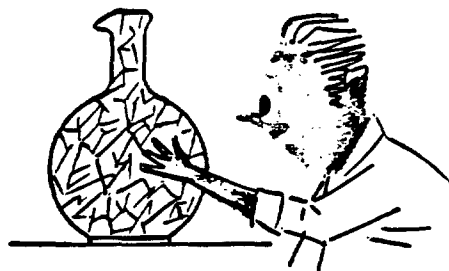


Likewise, a French chemist's inadvertent clumsiness brought about a great advance in automotive safety. In his laboratory one day, Edouard Benedictus accidentally dropped a glass flask on the floor. When he stooped down to pick up the pieces, there were no pieces! Though the glass radiated cracks, it remained intact.

Then Dr. Benedictus remembered the flask had once held a liquid cellulose mixture. It had evaporated to form a film inside, preventing the glass from shattering.

Some time later, when he witnessed an automobile accident in which several passengers were cut by flying glass, the chemist recalled the incident. Dashing off to his laboratory, he developed the first piece of laminated glass by spreading the transparent cellulose-like material between two

sheets of glass. It was the forerunner of modern safety glass.



Tremendous trifles have spawned untold numbers of advances in medical science. At this moment a clue to controlling cancer may be staring at a medical student from the pages of an elementary biology textbook. Or perhaps the solution to the problem of hypertension may come from a chance conversation. It has happened before.

The brilliant Dr. Edward Jenner once heard a milkmaid remark: "I cannot take smallpox because I have had the cowpox." From that slight hint, Jenner developed the vaccine that renders the human body immune to smallpox.

Another great medical advance resulted from Wilhelm Roentgen's careless tossing of a key atop an undeveloped photographic plate covered with black paper. Then he happened to turn on a cathode tube with which he was experimenting. When a laboratory assistant later developed the plate and it came to Roentgen, he saw an outline of the key on the negative. The rays of the cathode tube had miraculously penetrated the black paper and led to Roentgen's building the first X-ray machine.



Trifling incidents with tremendous potential occur constantly. But not everyone recognizes their significance. As Louis Pasteur once remarked: "... chance favors only the minds which are prepared."#



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New Cars with the Old Look

Reproductions of early models are an increasingly popular automotive novelty

DRIVERS WITH A YEN for transportation novelty are happy with the latest off-beat cars. These motorists are the proud owners of newly manufactured reproductions of automobiles that grandfather drove.

The "new cars with the old look" are hybrids of the highways—in a class by themselves. They combine the colorful and the practical from both ends of the automotive spectrum.

In design, they appeal to motorists who prefer modern antiques" to authentic old cars. At the same time, they eliminate such ordeals as cranking, roadside tire patching and getting out and getting under.

Most new versions of automobiles familiar to the master-and-goggles set of yesteryear generate nostalgia and attract attention wherever they go. Despite some modifications, they retain buggy-like bodies with surrey tops, curved dashboards, tiller steering,

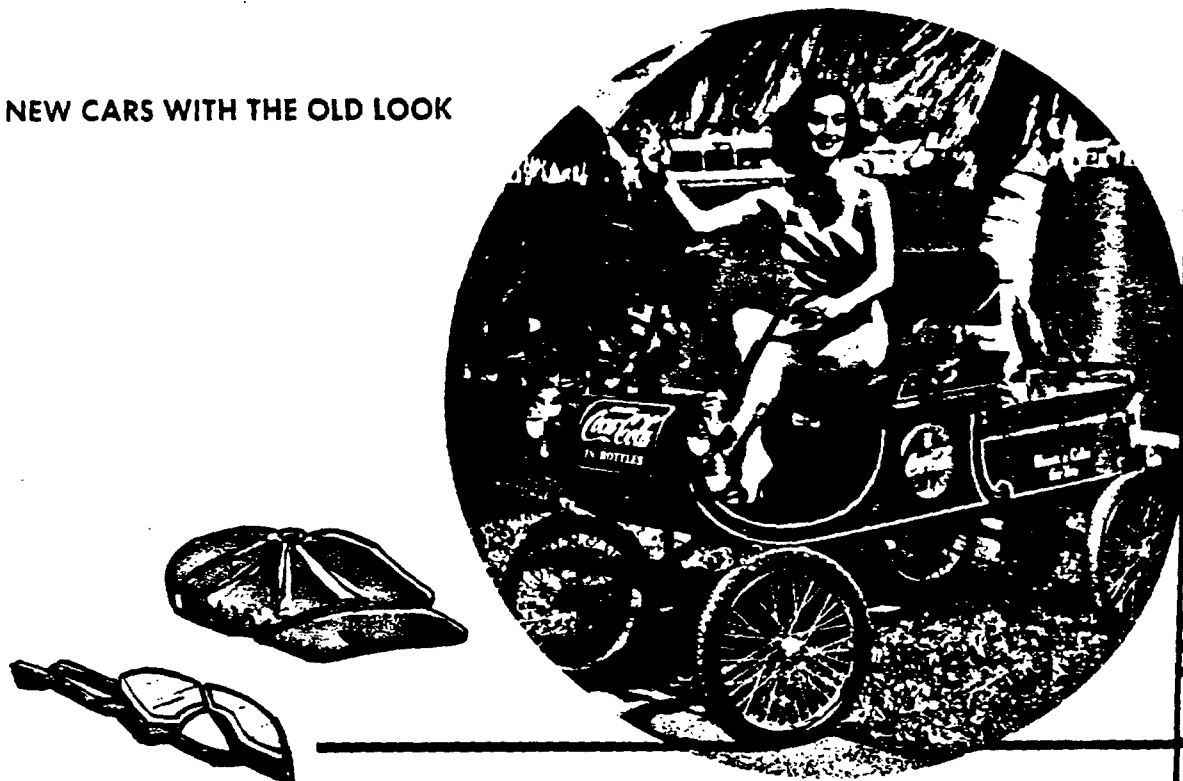
bulb horns, chain drives, bicycle-type tires and brass trimmings.

Modern equipment and accessories have been added inconspicuously for comfort and safety. Among these conveniences are self starters, four wheel brakes, sealed beam headlights, automatic windshield wipers, direction signals, 12-volt electrical systems and foam rubber upholstery with plastic coverings. Some of these and other features are required for licensed highway operation and to meet insurance standards.

Old car reproductions are manufactured in the same size and somewhat smaller than originals, but most copies are faithful in scale and proportions. Makers of standard autos seldom permit replica companies to use the names of cars still in regular production. Ford and Rambler are exceptions.

Like their predecessors of the early 1900's, none

NEW CARS WITH THE OLD LOOK



of the reproductions are capable of breakneck speeds. Few of them can go faster than 30 to 35 miles an hour, with a slower pace much more common. Engines, usually one to four cylinders, seldom exceed six to eight horsepower. Such limitations result in gasoline economy that ranges from 40 to over 75 miles per gallon.

Appeal to Esoteric Motorists

There are no accurate records of the number and kind of people who own old car replicas, but estimates range from about 2,500 to more than 4,000. Substantial increases are anticipated. Most owners apparently are esoteric motorists with unorthodox preferences. The novelty car population is concentrated in Florida, California, urban centers elsewhere and at resorts. Nearly 300 units of one make were sold in New York City alone last year.

A good many of the current old timers are driven purely for casual or exhibitionist enjoyment. Practical uses, however, are growing. Housewives find them handy for errands. The teenager with one at his disposal has a guarantee of social popularity. Less conservative businessmen drive their modern antiques to golf courses and resorts.

Because they are so conspicuous, brightly painted

and placarded old car reproductions are being operated as commercial vehicles and as sales promotion tools. Television, moving picture and theatrical entertainers own and drive them for publicity purposes. Political candidates are barnstorming and speaking from them during this year's campaigns.

This diversified and somewhat bizarre use pattern is a far cry from the modest beginnings of old car replica building on a commercial scale. Although it is hard to pinpoint the first model marketed, it is known that the business began experimentally only about a dozen years ago. It has burgeoned into a success on a wave of buyer enthusiasm. Now some 250 reproductions are being turned out by manufacturers monthly.

The principal replica firms use catchy slogans and streamlined promotion techniques to help boost sales. The pioneering Starts Manufacturing Company and the American Air Products Company, both of Ft. Lauderdale, Fla., advertise their "Rollsmobile" and "Merry '01" as "The car with the backward look."

A similar note is struck by the Dyer Products Company of Canton, Ohio, and Old Time Autos, Ltd., New York, in describing their "Surrey '03" as "The car with the bashful look."



se of their eye-catching qualities, new models of au-
ive old timers are gaining popularity as effective props
h sales promotion (left) and political campaigns (above).



At the same time, they are being promoted for more
practical uses too. This housewife finds hers handy
for shopping and other family errands.

Brochures for the Swift Manufacturing Com-
pany's Roadster, Cat and Utility models produced
in San Diego, Cal., point happily to the speed and
simplicity of making repairs. Milwaukee's Banner
Welder Company, manufacturer of the "Banner
Boy Buckboard," is proud of a mechanism designed
to operate as "the equivalent of an automatic trans-
mission."

With an eye on the do-it-yourself enthusiast,
some outlets are offering old car reproductions in
kit form as well as in ready-to-drive condition.
Prices are lower, of course, when the customer
assembles the car himself.

Cost up to \$1,500

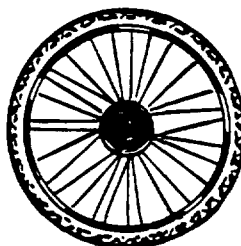
The "Surrey '03," for example, costs \$1,384
complete, but is available for \$995 in sections and
parts. In general, most old car replicas sell, in one
form or the other, for prices ranging up to around
\$1,500. As with standard cars, there are extra
charges for certain accessories and fittings.

Most manufacturers are undaunted by the achieve-
ments of Detroit's automotive giants. One even
cites his car for "luxurious riding comfort, thrilling
sport or lightweight economy."

He's finding plenty of takers. #

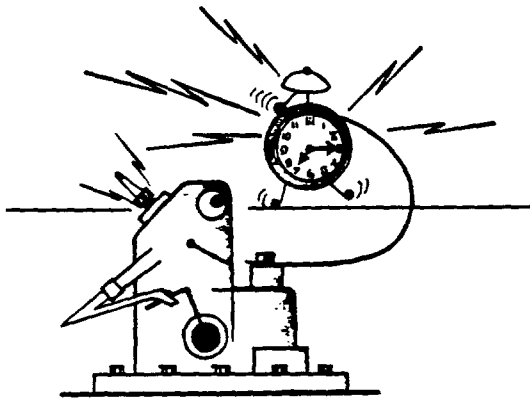


Admittedly no competition for Detroit's prolific as-
sembly lines, old car reproduction plants hand-build
units at a current rate of about 250 a month.



Self-Starting Test Engine Puts in Longer Work Day

A TEST ENGINE WITH A BRAIN—or at least enough know-how to start spontaneously early each morning—has been built by an Ethyl Corporation dynamometer operator foreman. Promptly at 7:15 a.m., the CFR knock-rating engine turns itself on



at the Ethyl Research Laboratories in Detroit. An hour later, it is all warmed up and ready to begin testing gasoline samples.

The engine's effective working day was extended a full hour by combining ingenuity and mechanical appliances. The latter include a timer, several switches, a solenoid and a few other fairly inexpensive devices.

Safety hasn't been forgotten either. If anything goes wrong, the engine shuts itself off promptly. So if it is motored and doesn't start, gasoline is not pumped through the fuel system. If the cooling water supply fails, the engine stops to avoid overheating. And if the belt to the dynamometer breaks, again it stops to prevent running away at no load.

These safety precautions permit unattended operation of the engine during lunch periods, further extending its work day. If all that isn't enough, the engine also knows enough not to start up on Saturdays and Sundays. #

New Drum Unloading System Is Faster, Safer, More Flexible

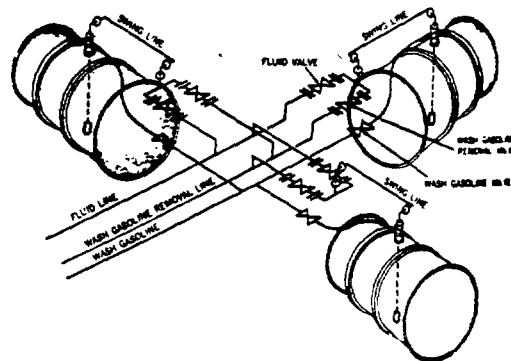
A NEW SYSTEM for unloading antiknock compounds from 55-gallon drums into weigh tanks at oil refineries has been designed by Ethyl Corporation. The system features faster unloadings, more accessible controls, more operating flexibility, easier drum handling and greater safety.

In the improved set-up, all valves for controlling drum unloading operations are concentrated in a small area on the drum platform. This enhances safety since the operator does not have to leave the platform to open and close valves.

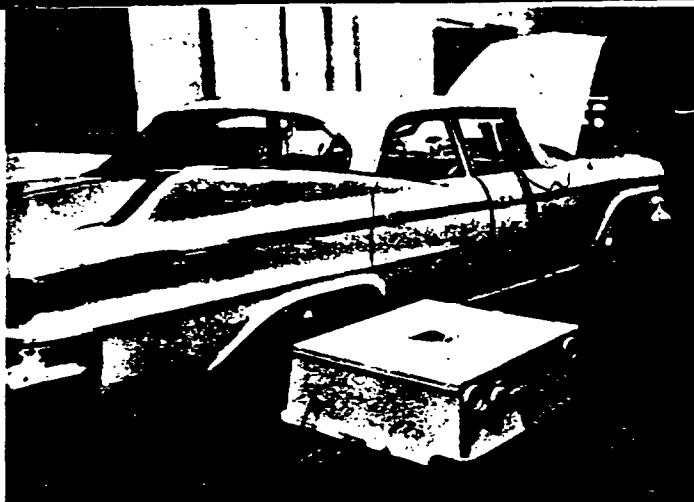
A new manifold also makes possible a more continuous operation. Two additional drums can be rolled up to each standpipe location and made ready for unloading while drums on the line are being emptied. By simply moving the swing line from one drum to another, the unloading can be continued without delay. After the switch is made, the empty drum is closed and replaced with another

full drum and the unloading sequence continues.

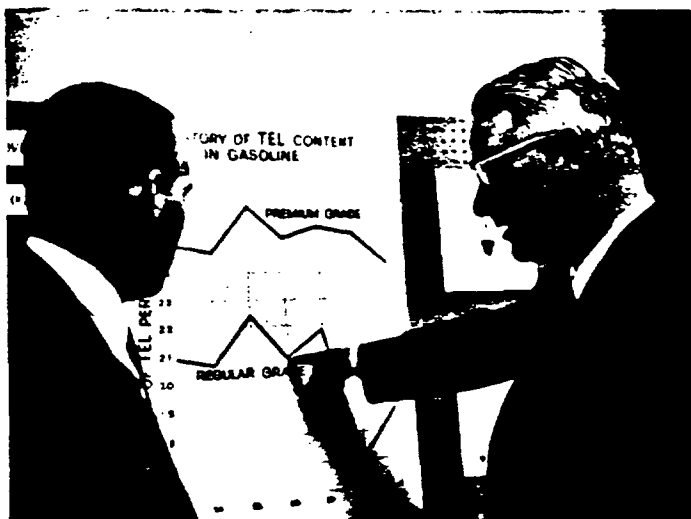
Operational flexibility is improved since a drum may be gasoline-washed as soon as it has been emptied. This does not interfere with the unloading of the two drums at the other standpipe locations. =



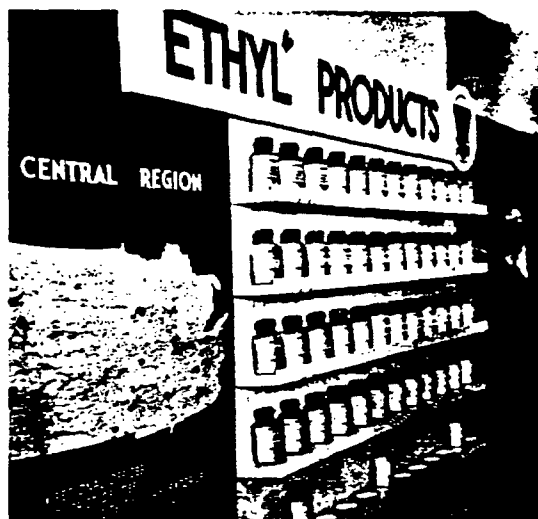
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A chassis dynamometer, complete with instruments, is one feature of the new servicenter. The equipment is used for indoor evaluation of motor vehicle performance.



Donald S. Flynn (right), Ethyl's Central region manager, discusses TEL concentrations in gasoline with a visitor at the center.



Among the opening-day displays was one exhibiting samples of Ethyl's growing list of products.

Showcase for Services

A NEW ETHYL CORPORATION SERVICENTER that provides a fully-equipped and convenient downtown headquarters for meetings, displays and demonstrations of interest to the petroleum and automotive industries was opened in Chicago late in May.

A feature of the center is a chassis dynamometer setup. This equipment permits the indoor evaluation of motor vehicle performance under simulated driving conditions. The center

also is equipped with movie and slide film projection facilities and a darkroom for on-the-spot developing of photographs taken there.

The servicenter is not intended solely for the presentation of Ethyl shows and exhibits. Oil companies have been invited to use the facilities for their own meetings and for joint presentations with Ethyl.

The new Chicago unit is the third of its kind. Others are in New York and Los Angeles.



TOP: "Jupiter Pool" at San Simeon Castle (now open to the public), built by the late William Randolph Hearst. BOTTOM LEFT: Sequoia National Park, nature at its most magnificent. BOTTOM MIDDLE: the historic ghost town of Calico, in the

Mojave Desert near Barstow. BOTTOM RIGHT: the remarkably beautiful and impressive San Diego Mission. This is what Magic Circles are made of—everywhere. If you didn't recognize this Magic Circle—it's the one around 'emphat' so7

Have you made a Magic Circle Trip lately?



What is a Magic Circle trip? It's you and your family on a fun-filled drive into the exciting countryside that surrounds you, wherever you live. A drive that has something for everyone in the family . . . fishing, boating, swimming . . . picnic areas . . . historic sites . . . scenery. Magic Circle trips are family fun at its best. And with today's new roads, driving is easier than ever. Just take your family and go.

And right now, see if you can guess where this Magic Circle is. You'll find all the clues you need in the pictures and the map.

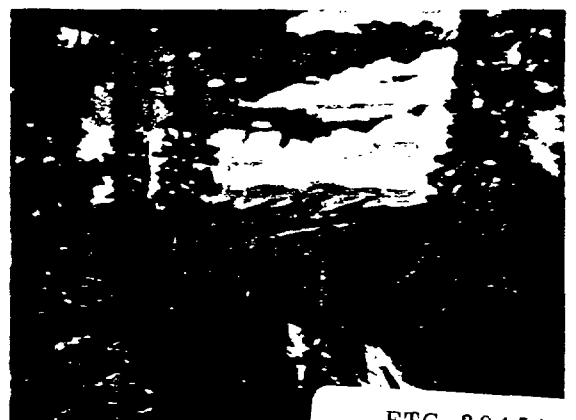
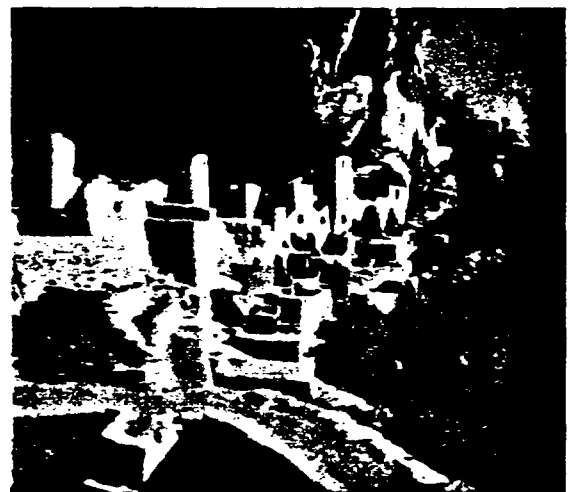
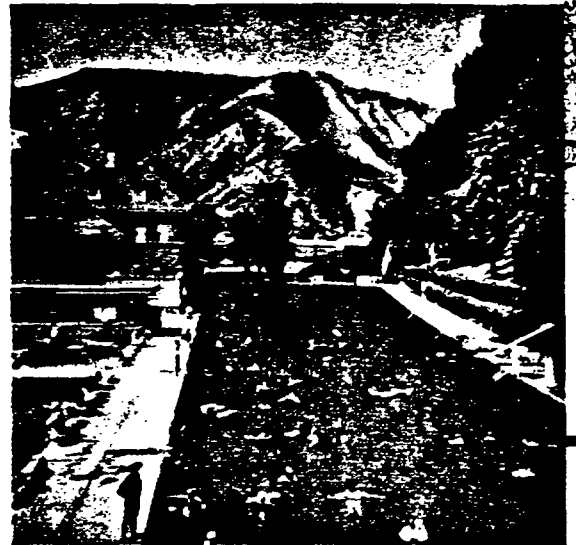


ETHYL CORPORATION
New York 17, New York

The Magic Circle advertisements are published by Ethyl Corp. to help you get more enjoyment out of your car. Ethyl makes additives used by oil companies everywhere, to improve their gasolines and your driving pleasure.

ETHYL NEWS

JULY-AUGUST 1960



ETC 29451

ETHYL NEWS

JULY-AUGUST 1960

ETHYL NEWS



THE COVER: Scenic wonders like Colorado's Balanced Rock in the Garden of the Gods await drivers using their cars for more pleasure trips. How Ethyl is promoting Magic Circle motoring in newspaper feature articles is described in "Continue On," beginning on page 1.

CONTINUE ON	1
Newspaper articles promote Magic Circle trips	
TAKING THE FOG OUT OF WRITING	5
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FROM SIDELINE TO SUCCESS	8
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WHAT TIME IS IT?	18
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page 2 (top), Standard Oil Co. (N. J.); (bottom left), Florida State News Bureau; (bottom right), Cranbrook Institutions; page 3 (bottom left) and page 4 (bottom right), New Mexico State Tourist Bureau; page 4 (top), Florida State News Bureau; pages 8-11, Gulf Oil Corporation; page 17 (top), the Oliver Corporation; page 19 (top), The Bettmann Archive; page 20 (bottom left) Frank L. Remington; (bottom right), New York Central Railroad; page 21 (top left), U. S. Navy; (top right), British Information Services; page 23 (right), W. Bode.

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Stanton P. Nickerson, Associate Editor

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Opinions expressed in signed articles are the authors'.

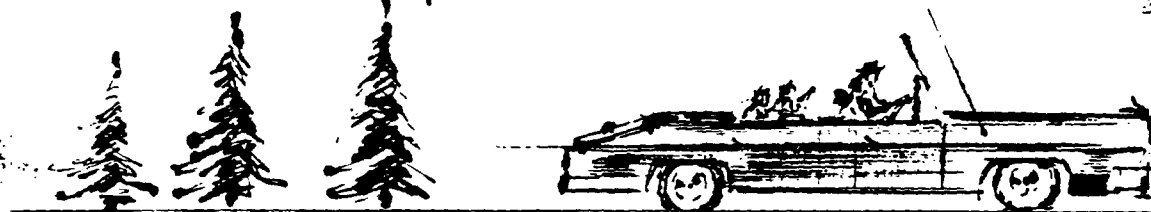
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ETC 29452

Automobile trips are much more fun when
motorists follow Ethyl's Magic Circle advice and . . .

Continue On

to lesser known points of interest off the beaten track



By Stanton P. Nickerson

NOT MANY PEOPLE KNOW about the beautiful drive along the lava rim of Grand Mesa where, looking north across to Battlement Mountain, you get the breathtaking effect of a gorge reminiscent of the Grand Canyon. By all means continue on to Colorado National Monument, where

nature wielded a generous red paintbrush to cover a wonderland of eroded sandstone formations . . . an amazing paved road loops through the park, via tunnels, to show off the flaming monoliths and ramparts to best advantage."

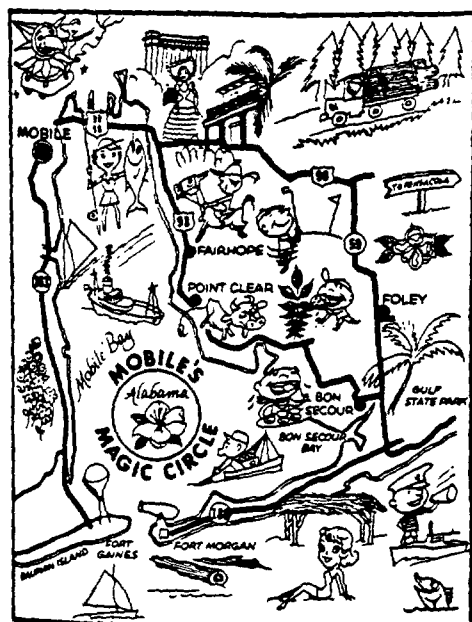
Thanks to travel tips like these, being sponsored by Ethyl Corporation, motorists everywhere are enjoying weekend and vacation tours more fully. Guidance on where to go and what to look for comes from Magic Circle articles written about attractions in various parts of the country. Published in leading newspapers, they are the backbone of Ethyl's travel clinics—part of the Company's national campaign to increase pleasure driving.

Fun and Adventure

Other clinic projects with similar objectives include "Personal Program Service" scripts containing suggestions for recreational trips by car. Mailings go regularly to 393 radio commentators throughout the country whose audiences are largely women. A color film, "Magic Circle, U.S.A.," has just been completed in Hollywood for theater and television showings. It emphasizes how much fun and adventure a typical family can have when exploring by automobile.

As the principal part of Ethyl's editorial travel

Maps with sketches of principal features in area Magic Circles help attract motorists.



CONTINUE ON

promotion, newspaper features are appearing currently in 182 Sunday papers in principal cities and in 300 smaller city dailies and county seat weeklies. A service to the motoring public, the articles are being carried by nearly twice as many newspapers this year as in 1959. Maps showing points of interest in area Magic Circles help attract and inform thousands of readers.

Magic Circles Everywhere

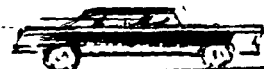
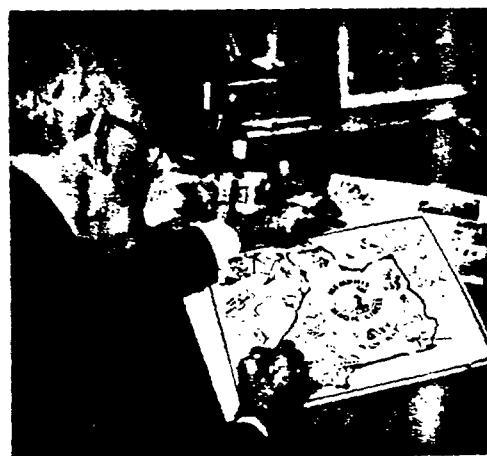
In addition to describing man-made and natural wonders of such sections as the Rockies (see cover, *ETHYL NEWS*, this issue) New England, the deep South and Mid-America's heartland, clinic feature articles stress the point that everyone's home city or town has its own Magic Circle. People are urged to get behind their wheels for day, weekend or more extended trips and visit scenic, cultural, historic, recreational or other landmarks easily reached by following back roads as well as main highways.

Car owners responding to these travel articles find that their automobiles are giving them far more service when pleasure trips are added to such



In planning trips, car owners can get expert help from oil company touring service offices.

Magic Circle maps, illustrating points of interest, are prepared carefully by professional artists.



The public can now visit this Palm Beach mansion, built in 1902 by Henry M. Flagler, Florida railroad magnate.



Paintings and sculpture at the Cranbrook Academy of Arts appeal to thousands of people visiting Detroit.



routine uses as going to the store, taking youngsters to playgrounds and similar everyday driving. From the oil industry's standpoint, increases in recreational outings bring customers to service stations more often, with commensurate gains in the sale of gasoline, lubricants and TBA items.

First-hand knowledge of all parts of the country, coupled with expert understanding of automotive travel and close working relationships with newspapers are platforms supporting the travel clinics' national success. Every effort is made to give readers of Magic Circle articles the latest, most timely and appealing hints about the limitless attractions waiting for them within easy driving distances.

Credit for much of what is being accomplished belongs to the editor of Magic Circle feature presentations. He is Edward A. Collier, public relations expert with Young & Rubicam, Inc., the New York advertising agency which handles Ethyl's account. Magic Circle editorial efforts have been under his direction since 1957.

Few writers in his field can equal Mr. Collier's qualifications. Aside from Alaska and Hawaii, he

has traveled extensively throughout all other states during the past 19 years, initially on behalf of the American Hotel Association. His guidebooks on what the motoring public wants are considered authoritative. Last fall his latest volume was published by Dodd Mead & Company—"Travel the Magic Circle"—describing 34 particularly worthwhile trips by car.

Of all characteristics of the Ethyl-sponsored travel features for newspapers, none are more important than their authenticity. Every story written is based upon the personal experience of Mr. Collier and the research of his colleagues. They are on the road continually. Supplementary facts are provided occasionally by such reliable sources as state tour bureaus and highway departments.

Careful with Details

The Young & Rubicam staff members have little difficulty in spotting misleading, distorted or exaggerated material sometimes foisted upon less experienced editors and writers. They are wary of such terms as "the largest," "the tallest," "the old-



Steam packet days live again for tourists driving to places like Greenfield Village at Dearborn, Mich.



Southwestern Magic Circles include picturesque adobe buildings of primitive Indian and Spanish origin.



CONTINUE ON



Lighthouses guarding coastal hazards are among the fascinating landmarks awaiting motorists.

More people than ever are seeing such national shrines as Independence Hall in Philadelphia.



est" and similar unverified superlatives. Details are always checked carefully, such as the two-word spelling of "Cow Town" for the rebuilt part of early Wichita, Kans., a new civic restoration project.

This first-hand and authoritative approach assures public confidence, extends reader acceptance and earns the respect of editors. Insistence upon accuracy and completeness in reporting has required Mr. Collier and his researchers to drive some 54,000 miles since January. Additional travel will boost their exploratory tours beyond the 100,000-mile mark by the end of the year.

Fact-finding and writing are coordinated with all field trips. Articles are always cleared through Mr. Collier for final editing before their distribution to newspapers. Two outstanding artists prepare illustrated maps to accompany all stories, showing routes and points of interest in each Magic Circle.

Non-commercial Attractions

Particular efforts are made to emphasize non-commercial attractions in all tours featured, and to call attention to points of interest frequently missed by uninformed drivers. The Los Angeles circle, for example, includes such unheralded attractions as the estate of William S. Hart, famous cowboy star of silent film days, now open to the public as a state park.

Early reports of tourist traffic this summer show increases, especially to lesser-known and off-the-main-road national and state parks, national monuments and historic sites. A supplementary trend is a gain in those who drive to more than one park.

With the Civil War's centennial beginning next year, battlefields and other sites associated with the conflict are drawing large historically-minded crowds. Other shore, mountain and lake country attractions, enjoyable at little or no cost, are experiencing similar popularity.

Ethyl believes that some measure of this growing interest in the nation's scenic, recreational and historical heritage stems from the appeal of Magic Circle travel promotion efforts.

As a whole, Ethyl's Magic Circle campaign has an enormous potential impact. If the nation's motorists drive only 30 more miles a month, for example, the average service station will sell 7,000 more gallons of gasoline during 1960. This would mean a total gain in annual consumption of some 1.4 billion gallons. #

Taking the Fog Out of Writing



Simpler and clearer style improves readability of Ethyl technical papers

TECHNICAL REPORTS that "read good—like a report should" are written regularly these days by engineers and chemists at Ethyl Corporation's research laboratories in Detroit. The reports owe their readability to short simple sentences, a limited number of multisyllable words and a clear style. Both the authors and their supervisors agree that the writing is much better than it was a couple of years ago.

What's responsible for the new look in technical reports?

The improvement—more noticeable all the time—can be traced directly to a course in clear writing conducted at the Laboratories in 1958 by Robert Gunning. Mr. Gunning is an ex-newspaperman. Since 1944 he has been a readability consultant, working with newspapers, popular and technical magazines, business and industry. His clients include *The Wall Street Journal*, United Press, Scripps-Howard newspapers, *Newsweek*, *The New York Times*, *Chemical and Engineering News*,

General Motors, Esso Research and Engineering, and the B&O Railroad.

At the Ethyl Laboratories, the course was offered to everyone who did a considerable amount of writing. Some 232 employees attended the series of six 1½-hour seminars. More than half of them also participated in 45-minute private consulting sessions to iron out personal writing problems.

Six Seminars Held

Subjects of the six seminars were: (1) Ten Ways to Improve Technical Writing; (2) How Readable Is Ethyl Writing?; (3) How to Organize Technical Reports and Letters; (4) How to Build a Fog-Free Vocabulary; (5) Workshop Session in Clear Writing; and (6) Developing a Clear Personal Style.

Basis of the instruction was a "Fog Index," developed by Mr. Gunning to measure writing complexity on the basis of sentence length and syllable count. He also uses a set of principles for clear writing which he considers helpful guides rather

TAKING THE FOG OUT OF WRITING

than rigid rules. Specimens of the "students" own writing were used to show where these guides applied and how they could be used effectively.

The Fog Index measures two things: (1) whether sentences are so long they discourage or derail the reader; and (2) whether the mixture of long, complex or abstract words is too rich for the reader to digest. Indirectly, it also helps writers follow other precepts of clear writing. These include the use of simple, direct sentences; elimination of unneeded words; and the use of active verbs. Most of all, it encourages writers to write the way they talk—briefly and with vigor.

Formula for Fog Index

In preparing his yardstick, Mr. Gunning studies a 100-word sample of an author's text. The number of words in each sentence is counted, and average sentence length noted. So is the number of words with three or more syllables. Other factors like verb tenses, proper names and necessary technical terms are also considered. Then, after evaluating his findings mathematically, Mr. Gunning converts the results into a Fog Index.

Collectively, the principal characteristics of writing as determined by Mr. Gunning's method show the number of years of schooling needed to under-

stand clearly what an author is trying to say.

The easy reading range (6-10) corresponds to a sixth through tenth grade education and includes most popular magazines. Eleven and 12 are classed as medium range, while 13-17 (college freshman through college graduate) are considered difficult. *Reader's Digest*, with a circulation of more than 12 million, has a Fog Index of nine.

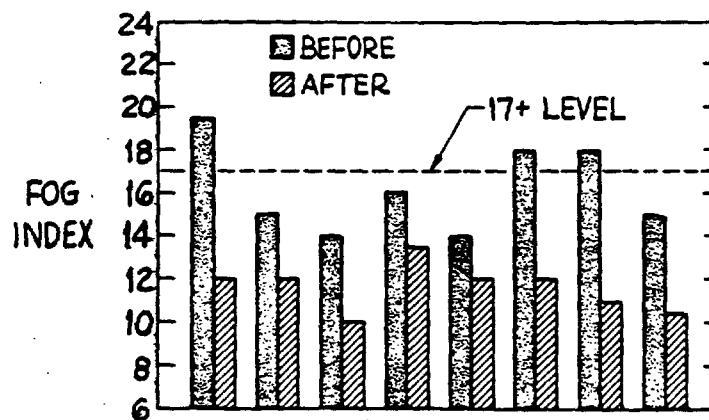
"Before" and "after" samplings taken recently of the writing of engineers and chemists at the Ethyl Laboratories tell an encouraging story. The before-training Fog Index of the chemists averaged a very difficult 17.9. After they had taken the course and had time to put the principles into practice, it was down to a high-school-senior level of 12.7.

The index of the eight engineers used in the evaluation averaged 16.2 before training, with three above 17. After training, they averaged 11.6, and all but one were writing below the 13 level.

Then a control sample of engineers and chemists who had not taken the Gunning course was evaluated. It showed no improvement in writing readability without training. In fact, the group's index rose from 17.2 to 17.7.

The Research Laboratories' management naturally is pleased with the results of the writing improvement course. They feel that its success is a

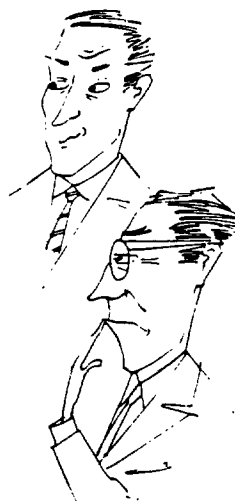
READABILITY OF PROGRESS REPORTS 8 RESEARCH ENGINEERS



Before taking the seminars, most of Ethyl's research men were writing at a level understandable only by college graduates. This chart shows how the scientists' reports improved in readability—reaching high school intelligence.

SP
6
70
17+

Although it is recognized that the question of soap content versus lubricating efficiency is a controversial subject in the grease industry, it is believed that the long record of eminently satisfactory lubrication performance, frequently under adverse conditions where no other grease was adequate, is sufficient evidence that high soap content is not a detriment insofar as barium greases are concerned. Further, it is felt that a comparison between different types of greases solely upon the basis of soap content is rather a pointless argument unless proper cognizance is taken of the differences in the molecular weights of the bases, of the ultimate effectiveness of the greases in lubricating bearing surfaces under service conditions, and of the various factors of composition that radically modify the oil-thickening action of the different soaps. 130 Words



9

The grease industry has long debated the effect of soap content on lubricating efficiency. Still, a long record of highly approved performance should show high soap content is no drawback in barium greases. Often they have succeeded where other greases failed.

Comparing greases by soap content is rather pointless anyway unless such questions as these are answered: How do molecular weights of their bases differ? How well does the grease lubricate bearing surfaces in service? What else in the grease might alter the oil-thickening action of the soaps?

SP-14-19-8-16-8-10-13-12 PS-18
28 Words
9 PS



As Mr. Gunning's notations show, a message can be conveyed much more effectively when it has a Fog Index of 9 than with a cumbersome rating of 17 plus.

tribute not only to Mr. Gunning's methods and ability but also to the trainees' willingness to accept new ideas and apply them.

They have an explanation, too, for the chemists' slightly higher Fog Index—both before and after training. The reason is the lack of simple synonyms for many chemical names and terms. This means that the number of polysyllable words can be reduced only so far.

To compete successfully in Fog Index, the average chemist would have to limit himself almost exclusively to brief, telegraphic sentences. These, of course, would be undesirable in most cases.

The Ethyl Laboratories' finding that writing experience — without training — raises Fog Indices

rather than lowering them was consistent with Mr. Gunning's earlier surveys. There is a usual tendency for writing complexity to increase over the years, he has found. This was as true with a noted political columnist whose writing was analyzed as with Ethyl engineers and chemists. Over a period of five years, the columnist's average sentence length increased 40 percent, with resulting damage to clarity, a Gunning study revealed.

Since improvement would not have come by itself, but has come because of the instruction, the Ethyl Laboratories' management is especially pleased with the course. Now the findings of Ethyl research will be more valuable than ever—presented in an attractive readable style. #

From S

Senior oilman Arthur O. Putnam, right, and his son Otis, president of Putnam Brothers Company, Houlton, Me., in their office doorway.



OF THE THOUSANDS OF OILMEN marketing petroleum products, none are more aware of their business progress than veterans with pioneering experience in the industry's early days.

One of these is Arthur O. Putnam, of Houlton, Me., a senior distributor for Gulf Oil products. Fifty years have passed since Mr. Putnam first began selling gasoline at a hardware store in northern Maine. Today his regional network of service stations and bulk plants supplies touring motorists, local residents, truckers, farmers, fishermen and others in the upper tiers of the Pine Tree State.

A lifetime resident of his community, Mr. Putnam is a founder, general manager and treasurer of the Putnam Brothers Company. In recognition of his service, he was honored recently when Gulf Oil officials presented him with a gold plaque for his half century as an independent distributor.

Although his accomplishments are unique in many respects, Mr. Putnam's experience in the oil business also parallels much of the industry's marketing history. Starting with oil products as a side-line, his business grew with the automotive era.



This hand-cranked gasoline pump is still in use on the Putnam farm.

1 Sideline to Success

Growth of Maine distributor's business since 1910 reflects oil industry history

Today, like other independent businessmen in oil distribution and retailing, he is responsible for much of the efficient service, courtesy and conveniences provided for the motoring public, farmers, householders and other oil consumers in his part of the country. He and his firm are practical ambassadors for the oil industry in dealing personally with consumers.

From Kerosene to Avgas

The Putnam Brothers Company is now dispensing nearly nine million gallons of petroleum products annually, ranging from kerosene and greases to motor and aviation gasolines. Its seventy service stations and 16 bulk plants are strategically located for maximum convenience, efficiency and business growth potentials in an area of some 20,000 square miles. A 14-unit tank truck fleet handles product distribution.

The Putnam Brothers Company has grown up with the automobile and its fuel requirements, has

lived close to farm mechanization and the trucking business and has kept pace with aviation.

When the firm began selling Gulf products in 1910, the venture was merely a sideline for brothers Arthur and Fred. They were then running a hardware store in Houlton, a thriving community on the threshold of Maine's Aroostook County potato acreage. Convinced that the automobile would mean new business for them, the pioneering merchants added 55-gallon drums of gasoline to their stock, as well as oils, kerosene and axle grease.

The novel sound of drums being rolled across the pine flooring of their store was soon followed by the welcome chug of horseless carriages with fuel tanks to be filled. Other customers included a few farmers with tractors and housewives who bought kerosene for lamps.

As the automobile population of Houlton and nearby communities rose, the Putnam Brothers Company naturally experienced larger demands for gasoline. Bulk storage tanks were built in 1912,

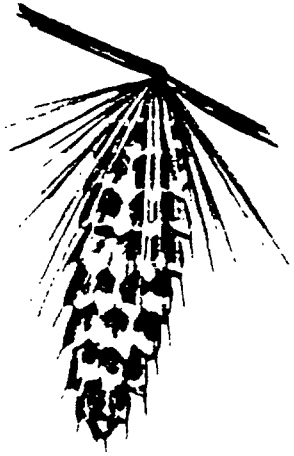


anked
till in
farm.



One of Mr. Putnam's business practices is to consult frequently with operators of his outlets in northern Maine. Like this one at Presque Island, Putnam service stations are modern, located advantageously and offer complete lines of Gulf products.

FROM SIDELINE TO SUCCESS



In honoring Mr. Putnam (right center) for his half century as an independent distributor, Gulf Oil officials presented him with a gold plaque. Those taking part in the ceremonies at Pittsburgh recently included his son Otis; Gulf Vice Presidents J. L. Lenker and R. A. Hunter; A. A. Stambaugh, Boston division sales manager; W. R. Cleary, sales representative, and Humphrey Flemington, office manager for Putnam Brothers Company.

supplied by railroad tank cars. Not content, however, to wait for paths to be beaten to their door, the brothers bought an 800-gallon horse-drawn tank wagon to serve scattered customers better, especially those on outlying farms.

Before long, horses were retired and tank wagons became tank trucks. Pumps at the store moved out to the curb and underground storage tanks replaced gasoline drums. In 1924, when the hardware business was sold, the brothers turned their full attention to extending their burgeoning oil sales.

The late 1920's saw new Putnam service stations built and bulk storage added throughout Maine's northern sectors. Lumber companies became important customers, with Putnam trucks grinding deep into rugged, sometimes snow-covered stands of pine, white oak and hemlock to bring gasoline, oil and lubricants for logging equipment.

Not even the depression of the 1930's slowed their expansion. In addition to increasing numbers of motorists, customers buying gasoline and other petroleum products included thirsty Americans heading for Canadian taverns to escape prohibition's boundaries. The Putnams followed this traffic by extending service stations and bulk tanks across the maritime provinces of Canada. These outlets were sold to British American Oil in 1935.

Unhampered expansion was impossible during World War II, of course, but business continued briskly as the company consolidated its position.

Senior partner Fred Putnam retired in 1945, but other Putnams assumed his responsibilities and concentrated on preparations to meet post-war needs. Growth reached a peak between 1951 and 1957, when 20 new service stations were built.

Still-active founder-brother Arthur Putnam, now 78, is the company's longest-service member and one of its most tireless workers. After an early breakfast, he is at his desk by 7:30, consulting during the day with sons A. Otis Putnam, Jr., president of the company, and Mellen P. Putnam, a director, and others of the 35-man office staff.

Long Experience Valuable

His knowledge and understanding, gained by long experience, is being applied effectively to new and recurring problems. Servicing planes flying hunters to Maine's big game territory, for example, is a recent and still growing source of income.

A business administration graduate of Maine's Bowdoin College in the class of 1906, Mr. Putnam developed an early belief in close working relationships between management and employees. Frequent trips take him deep into Putnam Brothers territory. Those who know the sprightly New Englander well point out how his enthusiasm for the oil business rubs off on all his company's personnel.

Zestful participation like this is doing much to give an auspicious lift to the start of his second half century. #



A 14-unit tank truck fleet brings gasoline from Putnam Brothers bulk plants to the company's 70 service stations.



Most of Mr. Putnam's service station operators report increases in sales this summer to touring motorists.



Younger men of proven ability are put in charge of Putnam service stations to help the business grow.

A tireless worker, the veteran Maine distributor is at his desk in Houlton by 7:30 every morning.



Brothers Arthur and Fred Putnam recall Canadian expansion by scanning newspaper headlines of 1933.



Brisk walks between his ancestral home and his office are how Mr. Putnam starts and ends each busy day.



Which Voter Are You?

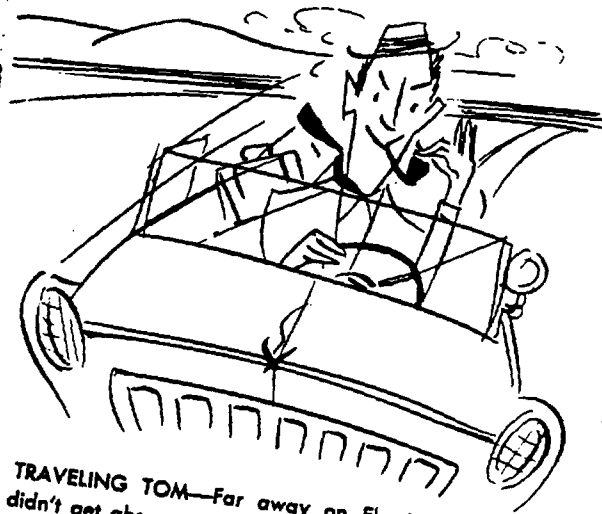
THE CONVENTIONS are over; the candidates nominated; the issues drawn. Between now and November 8, the American voter will be wooed, cajoled, persuaded and urged to vote—preferably the way the candidates and parties think he should—but at least to vote. The reminder will go out by newspaper, magazine, radio, television, public declaration—by every means possible.

Election Day 1960 gives America an opportunity to demonstrate to the world that it practices widely the democracy it proclaims. It gives more than 100 million citizens a chance to have an active voice in the affairs of their communities, states and the nation.

Unfortunately, however, as our artist has suggested on these pages, experience shows that American voters come in assorted sizes, shapes, varieties and frames of mind.

In the next few weeks, you'll have plenty of time to formulate your answer to a very important question:

WHICH VOTER ARE YOU?



TRAVELING TOM—Far away on Election Day, he didn't get absentee ballot; can't vote.



NONREGISTERED NED—Waits til it's too late to find that his name's not in the book.



TARDY TED—Fully intends to cast ballot, but doesn't quite get to polls in time.



FORGETFUL FRANK—Remembers the special day all right, but plum forgets what it's for.



PUZZLED PETE—Here it is time to vote and he doesn't know candidates or understand issues.



APATHETIC AL—Doesn't care; doesn't think his "one little vote" is important.



SPOILER SAM—Invalidates ballot through error; never learned how to mark it correctly.



EXEMPLARY ED—Public-spirited citizen No. 1; votes promptly and intelligently; reminds friends and neighbors to do the same.

Dear Mr. Jones:

An inquiry about gasoline prices focuses attention on how
taxes per gallon have risen 50 percent in ten years

209 East Cedar Road
Evergreen, Conn.
August 18, 1960

Ethyl Corporation
100 Park Avenue
New York 17, New York

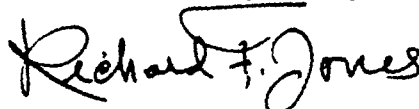
Gentlemen:

As a high school driver training instructor who is looking forward to a new term this fall, I would appreciate it if you will kindly supply me with some information about gasoline prices.

While it isn't a prescribed part of our course, the subject came up for discussion with increasing frequency last year. My students hear their parents talk about how much gasoline costs to run the family car and as new drivers with limited amounts of spending money, they also come to know this from personal experience.

I, myself, am under the impression that gasoline does cost more than it used to, so an explanation of gasoline prices would be helpful to me as well as to my students.

Yours very truly,



Richard F. Jones

ETHYL CORPORATION

100 PARK AVENUE BUILDING AT 41ST STREET

NEW YORK 17, N. Y.

Mr. Richard F. Jones
209 East Cedar Road
Evergreen, Connecticut

August 19, 1960

Dear Mr. Jones:

Unfortunately, you and your students are not alone in thinking that gasoline prices are up. There are lots of other people who think the same thing. What they don't know is that in 1960 gasoline has been selling for less than a half cent a gallon more than it was 10 years ago—and gasoline quality is at the highest level in history. IT'S THE TAX THAT'S HIGH!

We are enclosing a table showing the average prices of regular grade gasoline in the United States for each year since 1920. You will see that it tells a good part of the story.

There are three column headings in the table. In the first, "Service Station Price (Excluding Taxes)," is the average per-gallon price that service station dealers charge for the gasoline they sell. Included in this price are the cost of the gasoline to the dealer, the expenses of running his station and his profit.

The "Gasoline Taxes" column shows the average amount of taxes added to the price of each gallon of gasoline by federal, state and local governments.

What motorists have had to pay for gasoline and taxes for each gallon they have purchased during the last 40 years is listed under "Service Station Price (Including Taxes)."

Let's look at these price-plus-taxes figures for a minute. Comparing 1960 with 1950, you will see that in the first six months of 1960, motorists paid an average of 30.6 cents every time they bought a

REGULAR GRADE GASOLINE PRICES AND TAXES, 1920-1960

Yearly Averages from 55 Representative Cities in the United States

Service Station Price (Excluding Taxes)			Gasoline Taxes	Service Station Price (Including Taxes)			
(cents per gallon)							
1920	29.7	0.1	29.8	1941	13.3	5.9	19.2
1921	26.1	0.2	26.3	1942	14.5	6.0	20.4
1922	24.8	0.4	25.2	1943	14.6	6.0	20.5
1923	21.1	0.9	22.0	1944	14.6	6.0	20.6
1924	19.5	1.5	20.9	1945	14.5	6.0	20.5
1925	20.1	2.1	22.2	1946	14.7	6.1	20.8
1926	21.0	2.4	23.4	1947	16.9	6.2	23.1
1927	18.3	2.8	21.1	1948	19.5	6.3	25.9
1928	18.0	3.0	20.9	1949	20.3	6.5	26.8
1929	17.9	3.5	21.4	1950	20.1	6.7	26.8
1930	16.2	3.8	20.0	1951	20.3	6.8	27.2
1931	13.0	4.0	17.0	1952	20.2	7.3	27.6
1932	13.3	4.6	17.9	1953	21.3	7.4	28.7
1933	12.4	5.4	17.8	1954	21.6	7.5	29.0
1934	13.6	5.2	18.9	1955	21.4	7.7	29.1
1935	13.6	5.3	18.8	1956	21.6	8.4	29.9
1936	14.1	5.4	19.5	1957	22.1	8.9	31.0
1937	14.6	5.4	20.0	1958	21.5	8.9	30.4
1938	14.1	5.4	19.5	1959	21.2	9.3	30.5
1939	13.3	5.4	18.8	1960 (Average for 1st 6 mos.)	20.5	10.1	30.6
1940	12.8	5.7	18.4				

Source: Platt's OILGRAM Price Service, 55 East Wacker Drive, Chicago, Ill.

Source: Platt's OILGRAM Price Service, 55-City Survey; Texaco Inc., 50-City Survey prior to July, 1955.

gallon of regular grade gasoline. Ten years earlier, they paid 26.8 cents.

But wait a minute! Before assuming that oil companies and dealers are charging a lot more for gasoline today than in 1950, CHECK THE TAX COLUMN. You will see right away how taxes have increased. From an average of 6.7 cents a gallon in 1950, they went up to 10.1 cents in the first half of 1960. In other words, you, your students, their parents and all other motorists are now paying an additional 3½ cents a gallon in taxes—or fully 50% more—than you paid only 10 years ago. Doesn't that explain a lot?

Now let's look once more at the figures under "Service Station Price (Excluding Taxes)." This shows what motorists pay for gasoline alone.

Going down this column, you will note that the average service station price for gasoline has been less than a half cent more in 1960 than it was in 1950—20.5 cents per gallon this year as compared with 20.1 cents a decade ago. This, we think you will agree, is an outstanding achievement by the oil industry—particularly when you consider how much other prices have risen during the last decade.

Not shown in the table is a second highly important fact: Even though gasoline prices, excluding taxes, are less than a half cent a gallon higher than they were in 1950, every gallon of gasoline does much more work today.

Ten years ago, the average octane number of regular grade gasoline was 84.0. Now it is up to 92.5. This means that every gallon of 1960 gasoline can deliver much more power, better engine performance and greater fuel economy. In addition to more octanes, other gasoline improvements are also contributing to more efficient and more dependable automobile transportation.

The final point we'd like to bring out is this: Taxes today add about 50% to the cost of every gallon of gasoline. In a year, what every motorist pays in gasoline taxes is enough to buy him 320 additional gallons of gasoline (excluding taxes); enough to drive 5,000 miles more.

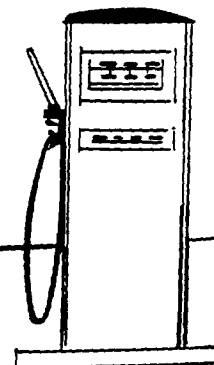
This is something that you, your students, and every American motorist should realize fully. The oil industry has done an outstanding job of building more and more value into every gallon of gasoline—and selling it at reasonable prices. The real problem facing all citizens is the heavy hand of gasoline taxes.

Yours very truly,

J. E. Boudreau

James E. Boudreau
Director of Public Relations

JEB:ag
Enc.



Citation for Tractor Service

A CITATION OF MERIT, recognizing Ethyl Corporation's contributions to the improvement of gasoline-powered tractors, was presented to the Company this summer. Awarded by The Oliver Corporation, which manufactured the first production-model high compression tractor engine, the citation reads: "In recognition of 25 years of invaluable cooperation given The Oliver Corporation by Ethyl engineers, in research dedicated to the improvement of high compression tractor engines."

D. W. Koegle, Oliver vice president and director of marketing, made the presentation at a commemorative dinner during a two-day seminar of Oliver sales executives and branch managers at Charles City, Iowa. Accepting the citation was C. George Krieger, manager of agricultural publicity in Ethyl's public relations department.

As an Ethyl agricultural engineer, Mr. Krieger was responsible for making the first high-compression tractor in 1934 by converting a distillate-burning unit on an Illinois farm. During the following year, he worked closely with Oliver in designing and developing the first production-model high compression tractor engine.



Oliver's D. W. Koegle presenting the citation to C. G. Krieger of Ethyl.

Over the intervening 25 years, Ethyl engineers have been responsible for a number of advances in tractor engines. One of their notable contributions was a joint research project with Oliver in building the XO-121, an experimental tractor with a 12-to-1 compression ratio. This unit has contributed to recent farm power improvements.

Appropriately, the Oliver citation is now on permanent display at the Ethyl Corporation Research Laboratories in Detroit.

New Manager for Export Sales



C. D. Carter

ucts to oil and related industries outside the United States and Canada.

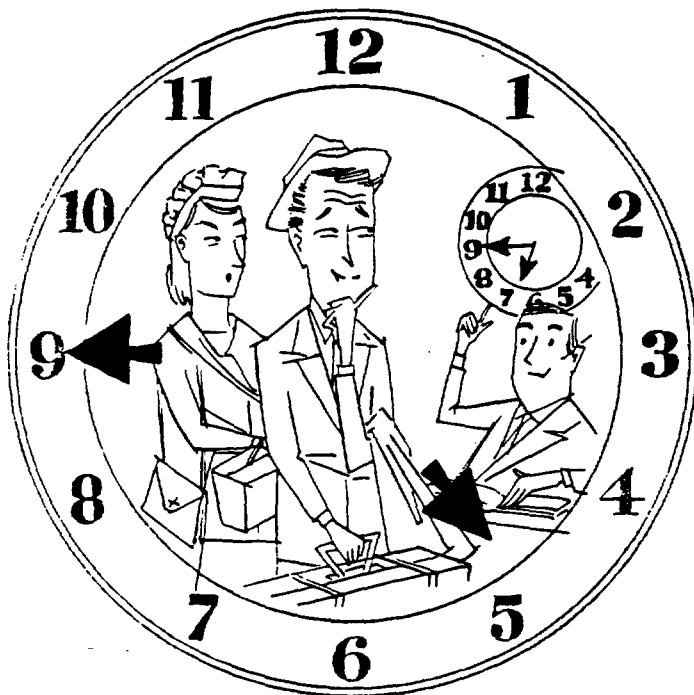
In assuming his new responsibilities, Mr. Carter

THE NEWLY CREATED position of export sales manager for Ethyl Corporation has been filled by the promotion of C. D. Carter, the Company announced early in August. He is now in charge of selling "Ethyl" antiknock compounds and other Ethyl chemical products

is drawing upon 18 years of experience with Ethyl in research, product service and safety, as well as 10 years in export sales.

He has been in charge of the Company's far eastern marketing since 1950, and will continue to do so. His services in various parts of the Orient have included an assignment as tetraethyl lead consultant to the Supreme Command for Allied Powers (SCAP) in Japan.

A native of Rochester, Ind., Mr. Carter was educated at the University of Michigan. After joining Ethyl in 1942, he worked for the Company in Detroit and Chicago. As export sales manager, his headquarters are in New York on the staff of Julian J. Frey, general export sales manager and assistant vice president for sales.



What T

Time zones can eliminate or add to confusion, depending on whether people understand them and know where daylight saving is in effect

By Frank L. Remington

EARLY THIS SUMMER, an Arizona family driving east phoned ahead for hotel reservations. "We'll hold the rooms until 5 o'clock," the clerk assured them.

Hours later the family trooped into the hotel with 15 minutes to spare—according to their watches. But their rooms had been taken. "When you didn't show up by 5 o'clock, we released your reservation," the clerk explained. "You're almost two hours late."

And so they were. Traveling eastward, they had passed from Mountain to Central time. That made them one hour late. They had also gone from a standard time area to a town operating on daylight saving time. This explained why their watches lagged two hours behind the hotel clock.

Many travelers on extended tours have similar troubles over the seemingly simple question of "What

time is it?" It's hard to keep the four standard time zones straight—Eastern, Central, Mountain and Pacific. Add to that the inconsistent adoption of daylight saving time and the confusion is worse.

Even so, telling time is easier than it was a few generations ago. The only "time" in those days was local time. Commonly termed "sun time," it was based upon the transit of the sun across the meridian. It varied approximately $4\frac{1}{2}$ seconds for each mile east or west.

With sun time, there is a difference of 10 seconds between the time at the Capitol dome and the Lincoln Memorial in Washington, D. C. Sun time at the eastern and western extremes of Chicago differs by about 67 seconds, and by about 30 seconds between the ends of the San Francisco-Oakland Bridge.

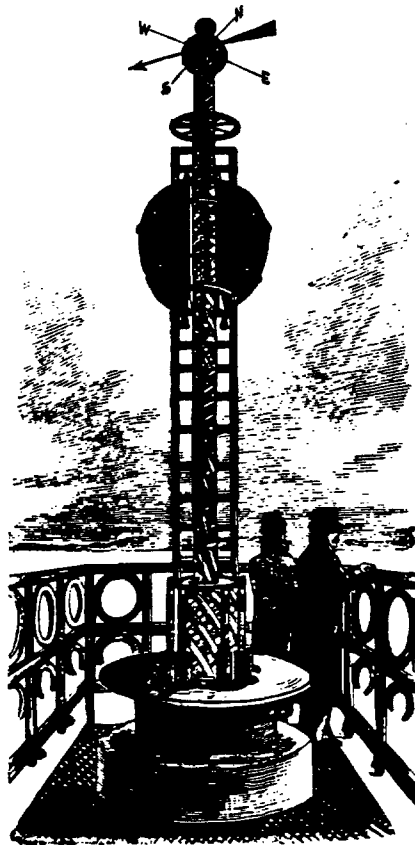
To avert utter chaos in time-telling, a standard based upon mean local sun time at the city hall or some other designated location was used. Large cities like Boston, New York and Kansas City used

Time Is It?

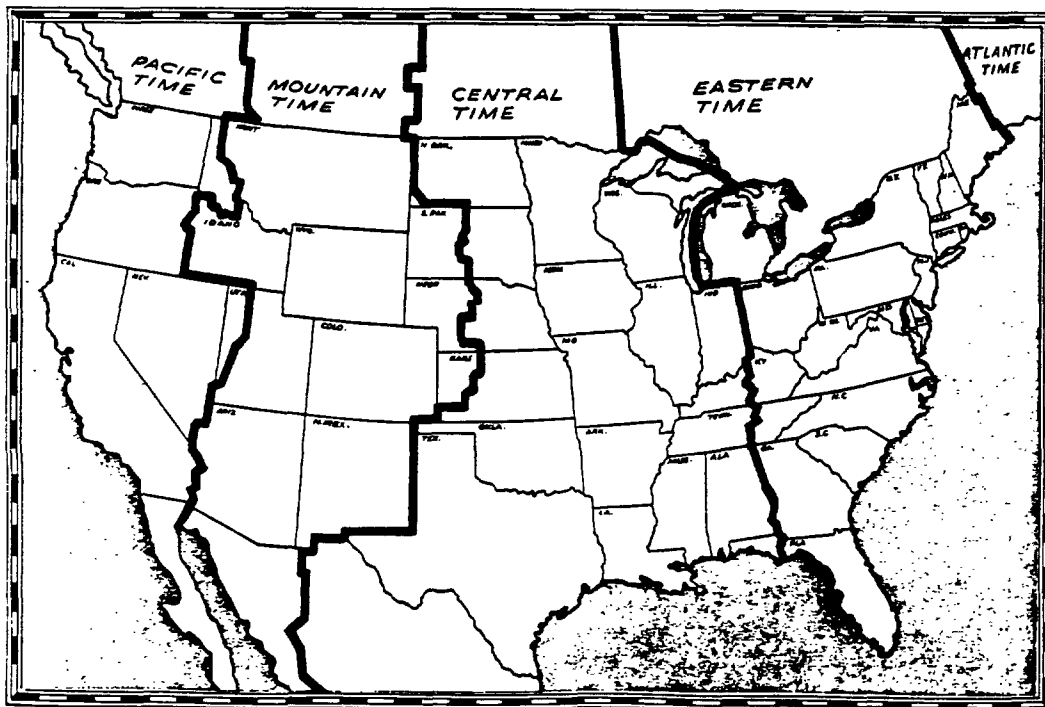
a time ball. Each day at noon, sun time, a large ball, sometimes three or four feet in diameter was lowered from a lofty mast. As the ball fell, watchers adjusted their timepieces to noon.

Of course, with so many local times throughout the country, train passengers, shippers and railway employees were bewildered. Errors occurred frequently, and sometimes were disastrous.

It is easy to see why. By solar time, when it was noon in Chicago it was 12:31 in Pittsburgh, 12:24 in Cleveland, 11:50 in St. Louis, and 11:27 in Omaha. There were some 27 local times in Michigan, 38 in Wisconsin, 27 in Illinois and 23 in Indiana. Some 100 different time zones existed in the country—none of which was clearly definable. The railroads alone operated under 68 local times. Traveling from Maine to California, a passenger set his watch at least 20 times.



Before standard time zones (below) were set up in 1883, cities signaled local sun time at noon by lowering a ball from instruments like this.



WHAT TIME IS IT?

At last, in 1883, railroad representatives met in a General Time Convention in St. Louis and adopted a plan formulated by William Frederick Allen. It divided the United States into four time zones based on sun time at the 75th, 90th, 105th, and 120th meridians west of Greenwich. The zones were to be known as Eastern, Central, Mountain and Pacific.

At an International Meridian Conference in 1884, standard time was extended to the whole world. The globe was divided into 24 time zones, each approximately 15 degrees, or 1/24th of a circle in width. Standard time in each zone varied by one hour from the next—one hour earlier toward the west and one hour later toward the east. Greenwich, England, was taken as the zero point.

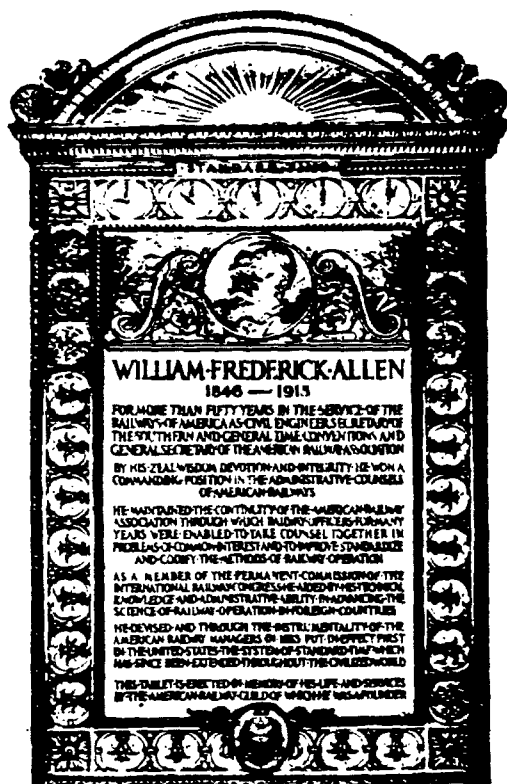
Most people liked standard time, but some diehards delayed in adopting it. The mayor of Bangor, Maine, deplored it because no one had the power "to change one of the immutable laws of God." An editorial in the Indianapolis *Sentinel* bitterly denounced railroad time. "The sun is no longer the boss," it asserted. "In the future the planets must make their circuits as railroad magnates arrange."

Many legal complications resulted from the changeover. One case in Iowa involved the question of whether a fire insurance policy which expired on a certain day should be governed by solar or standard time. If sun time governed, the policy was in force when the fire broke out. If standard time governed, then the policy ceased to be in force 2½ minutes before the fire started. The Supreme Court held that the presumption was that the parties to contract intended sun time and decided in favor of the policy-holder.

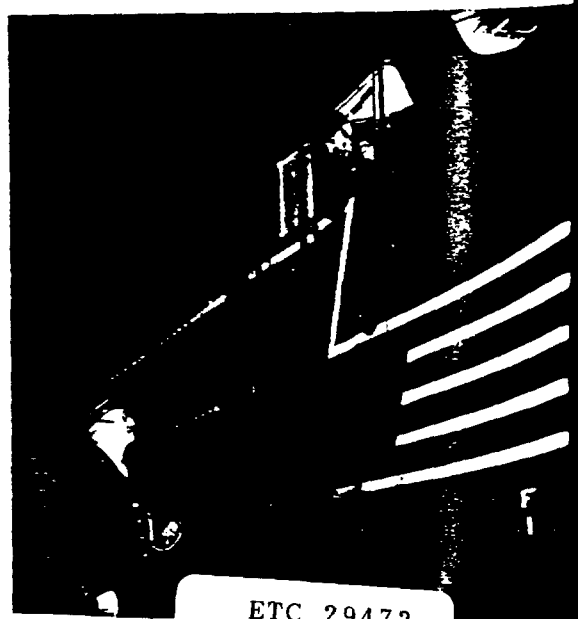
ICC Sets Zone Boundaries

Officially, Uncle Sam did not get around to sanctioning standard time until 35 years after the General Time Convention. On March 19, 1918, Congress passed the Standard Time Act. It approved the standard time used by railroads and delegated to the Interstate Commerce Commission the authority to make definite boundaries between the four time zones in the United States.

With the admission of Alaska and Hawaii to statehood, parts of the country now extend into three new time zones. In addition to Pacific time,



Without systematic coordination of correct standard times everywhere, it would be impossible to schedule trains, planes or network broadcasts in any workable form. This plaque (left) honors William Frederick Allen, the engineering railroader who proposed our Eastern, Central, Mountain and Pacific time zones.



ETC 29472

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This quartz-crystal clock at the U.S. Naval Observatory (left) is used in transmitting accurate time signals by radio. When world-wide time zones were agreed upon in 1884, their starting point became the Royal Observatory (right) at Greenwich, England.

the largest state operates on Yukon, Alaska Standard and Bering time. All clocks in the Aloha state's island chain are on Hawaiian Standard time, which is the same as Alaska Standard. Eastern Canada, Puerto Rico and the U. S. Virgin Islands are on Atlantic time, an hour later than Eastern.

Today, of course, it would be almost impossible for the countries of the world to conduct their affairs without standard time. The lives and habits of everyone as well as the efficient operation of business and commerce are closely geared to it.

Chickens Know Better

Protests similar to those raised over the adoption of standard time echo annually across the nation every April when many areas go on daylight saving time. One recalcitrant farmer wrote his Congressman that "When it is 8 p.m. by the clock, I go out to shut up the chickens. But they won't go in because they know it's only 7 p.m."

There's no escaping the confusion of the various summer time zones. But if you ever phone ahead for reservations, be sure to ask "What time is it?" Then you can set your watch accordingly and increase your chances of arriving on time. #

CENTRAL VS. EASTERN

Although boundaries between time zones were set many years ago, they are by no means unchangeable. Early this year, for example, the Interstate Commerce Commission decided on a shift that put most of the eastern half of Kentucky and part of northern Tennessee on Eastern time. The ICC thus sided with Frankfort, the Kentucky capital, and other cities, against rural groups that wanted to remain on Central time. The change was effective April 3.

At the same time, the Commission has not decided on requests from Louisville, Nashville and Indianapolis for a shift from Central to Eastern time. Like the transferred areas, these centers want to be on Eastern time because of economic ties with the East. Businessmen claim it is an advantage to be on the same time that Easterners observe. Courthouses, farm organizations, school boards and other rural factions hold out for Central time. They maintain that a change requires farmers to work in the heavy dew of early morning, interferes with milking habits, raises farm costs and inconveniences school children and teachers.

Driller of Destiny



Curtis G. Hamill, only survivor of the Lucas gusher drilling crew.

Key moment in the drama of oil lives for a veteran of Spindletop as he recalls colorful era of industry's expansion in the Southwest

IN A MODERN RANCH-STYLE HOUSE, in a quiet residential section of Kerrville, Texas, lives a man who helped change the face of the earth.

The attractive furnishings in the living room of his comfortable home include no obvious, visible reminder of petroleum. But sit and listen to the friendly, alert 88-year-old patriarch for a while and one of the pivotal moments of oil history springs dramatically to life.

More than 59 eventful years have passed since that January morning when THE well came in with a roar that was to be heard round the world, but he recalls the day, and those leading up to it, with remarkable vividness.

"I was on the scaffold board, high on the wooden derrick, when it blew," he begins. "The first puff hit me and I was blinded by mud and oil. Before I could get to the ladder, the second blow came. I don't know how I ever reached the derrick floor, but when I did, it seemed to be filled with oil.

"Above the tremendous roar, I could hear the others calling to me to run clear, but the machinery was still running. I knew that if the traveling block went all the way to the top, it would crash into the crown block and tear the derrick down. Somehow,

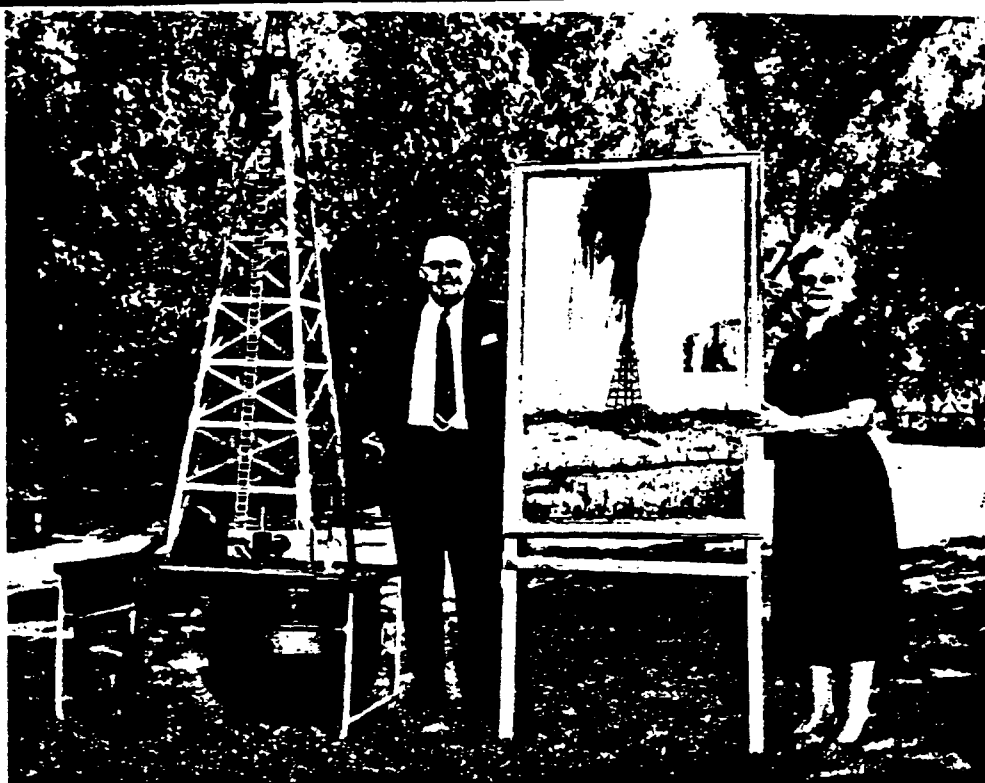
I managed to grope through the oil, kick the clutch out, and stop the machinery. Then, stumbling out, I joined the rest of the crew.

"Only after I yanked out my shirttail and wiped the oil from my face and eyes, did I see the six-inch column of oil blasting its way up through the derrick and 100 feet into the sky."

The man thus recounting this sensational strike is Curtis G. Hamill. He was one of three brothers in an enterprising, dedicated four-man crew that drilled on a low hill above the swampy ground outside of Beaumont, Texas. The hill was called Spindletop; the well was the fabulous 100,000-barrel-a-day Lucas gusher.

Drama's Lone Survivor

Of the colorful cast of characters that appeared on stage in this great oil drama, Mr. Hamill is the lone survivor. His two brothers, Al and Jim; Peck Byrd, the fourth member of the crew; and such other well-known Spindletop personalities as the determined Captain Anthony Lucas; the great wild-cattling team of Guffey and Galey; and visionary



Recalling his unique career, Mr. Hamill and his wife pose with mementos of the big Lucas strike and its vast outpouring of crude. On top of the kettle in which Mrs. Hamill once boiled her husband's work clothes, he has built a model of the well.

Pattillo Higgins have taken their places in the pages of oil history.

After Spindletop, Curtis Hamill became a successful drilling contractor and producer, until his retirement some 15 years ago.

In company with the mushrooming industry, Mr. Hamill profited by the lessons of Spindletop in locating and drilling for oil. That prolific producer counted a number of "firsts" among its many other achievements. It was the first of the great salt dome wells of the Gulf Coast area. It was one of the first successful wells drilled by a rotary rig, in contrast to the clumsier cable tool outfits used in Eastern oil regions. And it was the first well to use drilling mud.

Now a multi-million-dollar industry, drilling mud was unheard of in Spindletop's day. But the sub-surface strata of soft sand of the Texas Gulf coast called for something drastic. The intrepid drillers finally discovered that if, instead of pumping water down the pipe, they pumped mud, it would plaster the sides of the hole and make them firm.

"A Reverend Chaney who owned the teams that

were used to clean out our water pits drove some of his cattle over when the pits were clean," the husky, broad-shouldered driller recalls of the first mud-making operations. "We put the cattle in the pits and started pouring water in. After four hours, the cattle had the bottom of that pit tromped into a mushy slush. We rigged up a hose from our drill pumps and pumped mud to the well."

Pennsylvania to Texas

Mr. Hamill's personal story starts much earlier than that memorable day that changed the course of oil—and probably world—history. Born in Westmoreland County, Pennsylvania, he moved with his family to a farm near Waco, Texas, in 1876. Although no one could know it at the time, the Hamill brothers were going from what was the pioneer oil state to what they were to help make the most productive one.

After attending Baylor University, Mr. Hamill became a farmer and dairyman, and in 1893 married Eva Smith. Over the intervening decades, he and his bride of 67 years have shared the strenuous

DRILLER OF DESTINY

life of the farm and the burgeoning oilfields. Now they are enjoying more leisurely retirement.

In the garage of their present modern home, the pioneer oilman likes to point out a memento of Spindletop and their earlier eventful years together. It is the huge cast iron kettle in which Mrs. Hamill boiled his oil-drenched clothes during those breathtaking days when the Lucas gusher was spewing its uncapped output all over the surrounding acres.

Rubdown with Bran

"When we came home at night to the house I had rented for Mrs. Hamill and the children about a mile from the well, she would throw my clothes in that pot. While the oil was cooking out, we rubbed ourselves with bran to remove as much of the smelly, sticky stuff as possible," he recounts.

Today, the pot has a scale-model motored drilling rig atop it, built by Mr. Hamill a few years ago. Powered by an electric motor, it circulates 20 gallons of oil a minute. Last year, when the veteran driller flew to New York to confound the panel on Garry Moore's "I've Got a Secret," the model rig,



The Hamill brothers—Al, Curtis and Jim—made up three-quarters of the four-man drilling crew which brought in the fabulous Lucas gusher at Spindletop.

complete with Spindletop washpot, made the journey and TV appearance, too.

Events leading up to Curtis Hamill's role in bringing in the historic gusher began when brothers Jim and Al turned from sinking artesian water wells to drilling for oil after petroleum had been discovered in Corsicana. In 1898, as the business grew, they persuaded Curtis to give up farming and join them as a tool dresser for \$55 a month. They soon bought a revolutionary rotary drilling rig. In due course, Curtis became a roughneck and then a driller.

Even this early in his career as an oilman, Mr. Hamill was close to the industry's beginnings. One of his neighbors was Charlie Baker, who had been waterboy at an oilwell back in Pennsylvania in a town named Titusville. Charlie's boss was named Edwin L. Drake—"Colonel," they called him.

But Mr. Hamill's own date with destiny was not long in coming. He tells how it happened:

"We were setting up our rig one day in Corsicana when Jim brought a man out to look at the machinery. He introduced the man to me as Captain Anthony Lucas. Captain Lucas wanted Jim to go to Beaumont and drill three wells for him. Jim agreed."

The rest of the story is history. Volumes have been written about Spindletop, the success of the Lucas gusher and its significance to the world.

Curtis Hamill went to work there because it was his job. He stayed on to help overcome all kinds of problems, work some 18 or more hours a day at what at times was backbreaking and heartbreaking labor, and to take part in a stirring chapter in oil's thrilling story.

"It was hard work," he says, "but at the time our only thought was to get the oil well drilled."

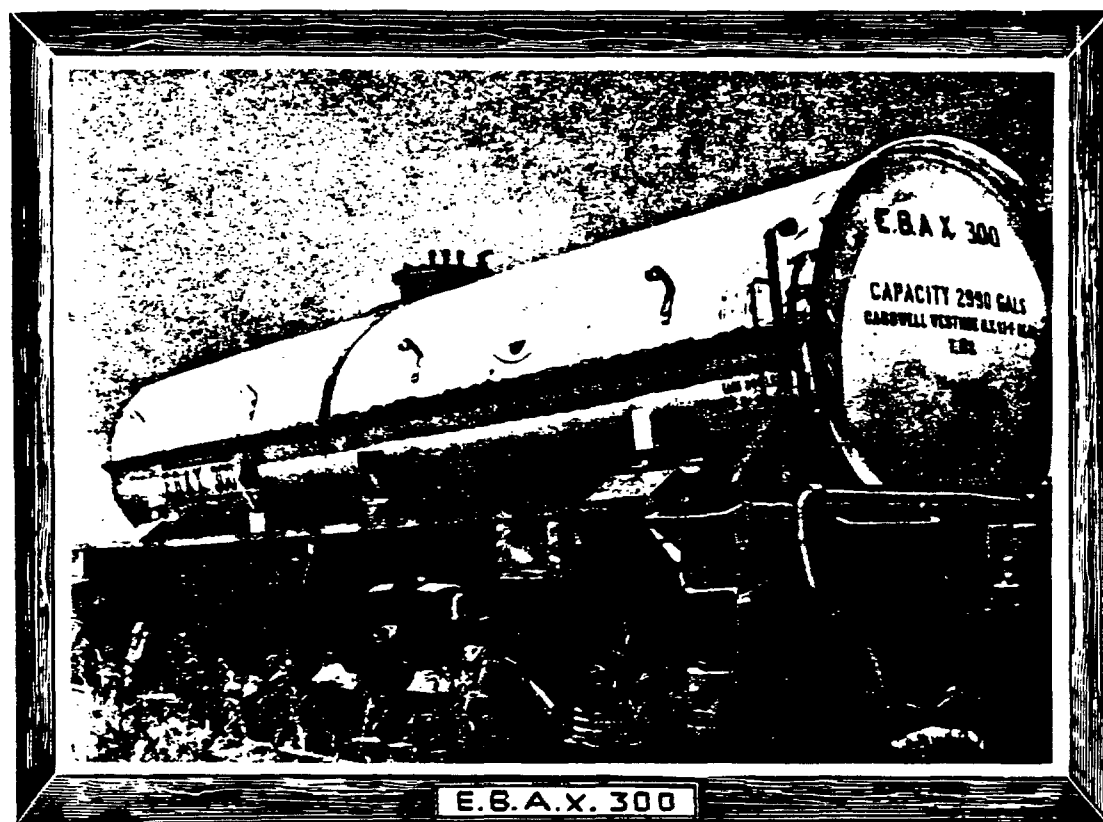
Full and Good Life

Today, as he enjoys his home, his garden, drives in his car and visits from his children and grandchildren, Mr. Hamill looks back on a full life and a good one.

"The well we drilled was a pattern for future wells. Our techniques were improved year after year. American oilmen have gone to the corners of the earth to teach our drilling and production methods. There is no doubt that oil has played a great role in the building of our prosperous nation.

"Looking back over the years, I can see what Spindletop did for the country and the world—and I am proud of the part I had in it."#

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Retirement for a Veteran

A VETERAN of 30 years of Ethyl Corporation and oil industry service retired this summer after extensive travel. Respite from a strenuously active business life was earned by "E.B.A.X. 300," a pioneer unit of Ethyl's 700-unit railroad tank car antiknock compound fleet.

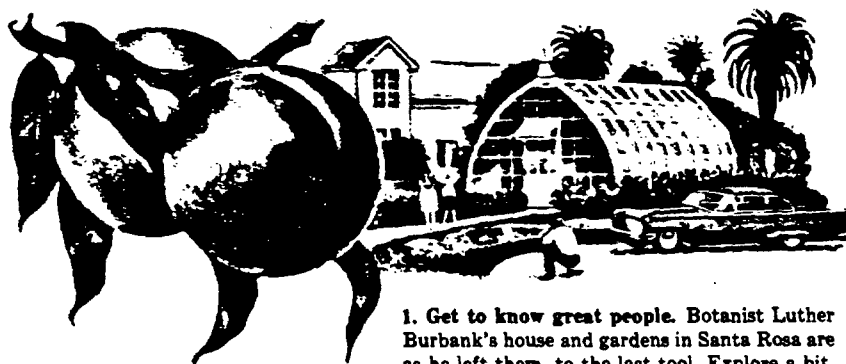
When Ethyl instituted railroad tank car deliveries of antiknock compounds in September of 1930, "E.B.A.X. 300" was among the first to enter service. In three decades since, it has criss-crossed the United States innumerable times, made many trips to Canada and Mexico, earned sea legs on ferries to Cuban refineries until recently, and piled up an estimated half-million miles of rail travel.

In all its long career of on-time, full-weight deliveries to oil refineries, the veteran piece of rolling stock has achieved an enviable safety record. Main-

tained in continuous operating condition, it has never been in an accident.

Like some 250 other Ethyl tank cars whose E.B.A.X. numbers begin with the digit "3," Old 300 has a 3,000-gallon capacity. The Company's antiknock compound railroad tank car fleet, which has a total capacity of 48 million pounds, also includes 457 6,000-gallon, and 38 9,000-gallon units. Their numbers begin with "6" and "9," respectively. "E.B.A." stands for "Ethyl Brand Antiknock compound" and the "X" signifies that the cars are privately owned.

The void left by the retirement of "E.B.A.X. 300" is a nostalgic one only, of course. In meeting the needs of customers, Ethyl is constantly expanding and modernizing its tank car fleet to provide ever-improved delivery service.

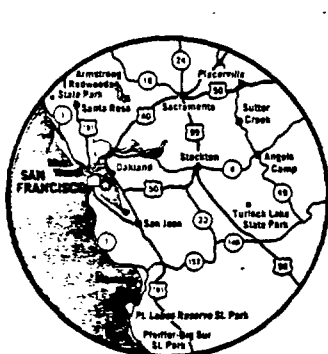


1. Get to know great people. Botanist Luther Burbank's house and gardens in Santa Rosa are as he left them, to the last tool. Explore a bit, and get close to famous names in your area.

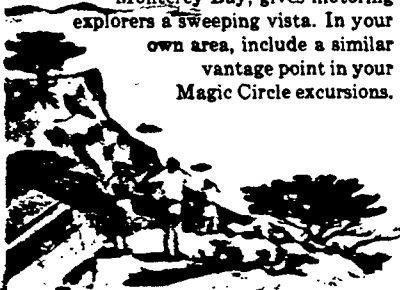
Your car makes any map a Magic Circle

In this Golden Gate Magic Circle, your car puts you on the threshold of a whole wonderful world of fun. And all around you is a Magic Circle just as attractive—simply head out of your driveway to find it.

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



2. Find a lookout spot. Rock-ribbed Point Lobos, at the southern end of Monterey Bay, gives motoring explorers a sweeping vista. In your own area, include a similar vantage point in your Magic Circle excursions.



3. Picnic in the shade. The trees in your Magic Circle may not cast quite as much coolness as California's giant redwoods, but your picnic in the open air will be no less appetizing—the drive along back roads no less delightful.

4. Get next to your local history. Highway 49 leads through California's gold rush country—through Sutter Creek, Angels Camp, Placerville. In your Magic Circle, the roads lead just as surely through the exciting pages of history.

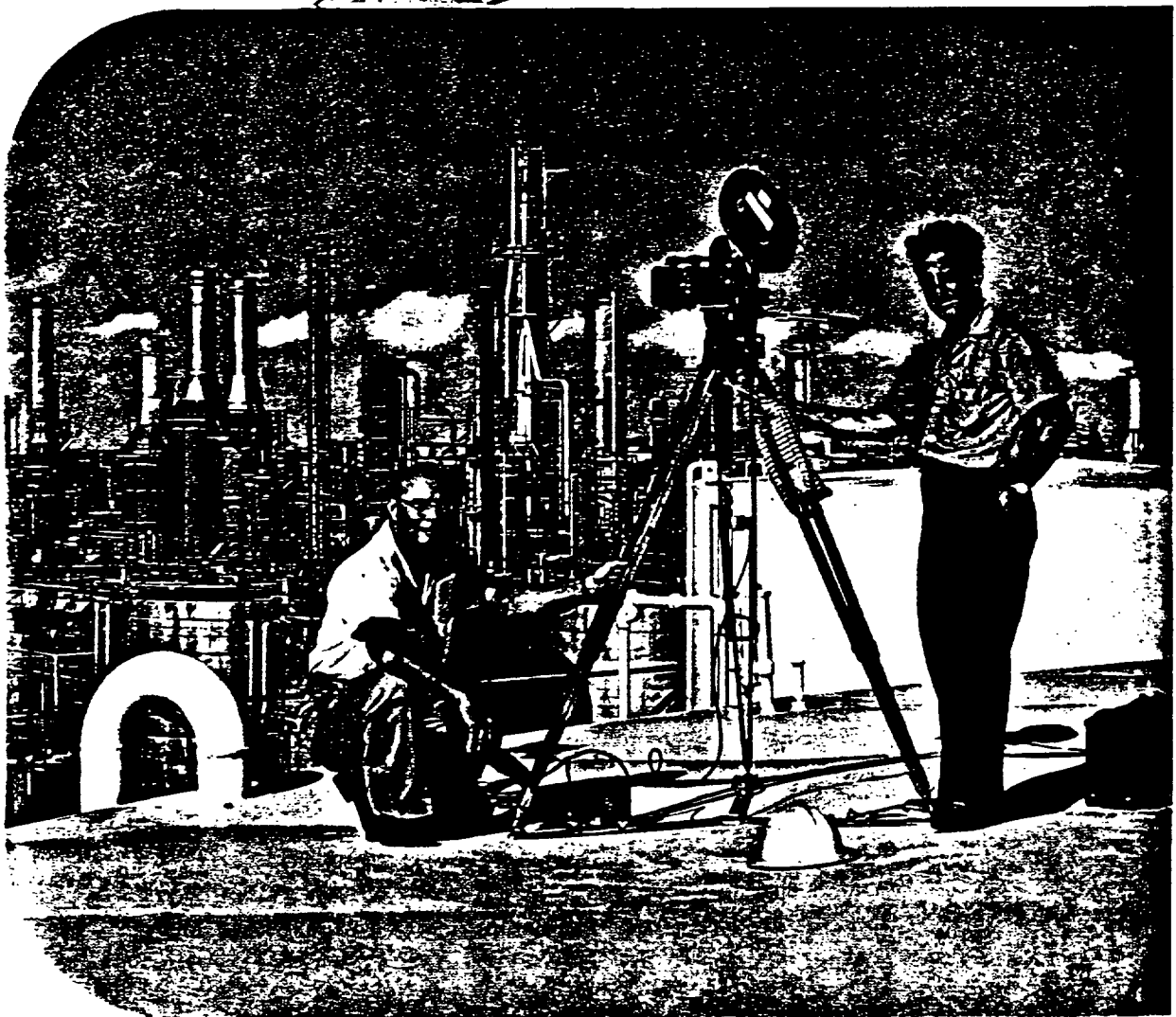


5. Take a pencil and map out your Magic Circle right now. You've got the car, and if you're missing out on this kind of driving, you aren't enjoying half of what your car investment offers you.



ETHYL NEWS

SEPTEMBER-OCTOBER 1960



"DANGER! AIR!"
A NEW ETHYL FILM FOR THE OIL INDUSTRY

ETHYL NEWS

SEPTEMBER-OCTOBER 1960

ETHYL NEWS



THE COVER shows H. M. DeVille, of Southwestern Oil and Refining Company, and Alex Gansell, of Audio Productions, on location at Southwestern's Corpus Christi, Texas, refinery, during the filming of "Danger! Air!" The scope of the new motion picture and its importance to the oil industry are described on pages 4-5.

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ETC 29480

"Truly Alarming Proportions"

A communications breakdown has permitted gasoline taxes to grow by leaps and bounds. To get them reduced, the tax story must be widely told

By B. B. Turner
President, Ethyl Corporation*

* The accompanying article is adapted from a talk given by Mr. Turner at the annual convention of the Association of Desk and Derrick Clubs of North America, in Detroit, late in September.

SINCE AMERICANS OWN or ride in nearly 70 million motor vehicles and chalk up trips totaling more than 625 billion miles a year, there can, of course, be no letup in highway construction. Presently, the states are extending highways at a great rate. During the next ten years, the federal government hopes to complete the 41,000-mile National System of Interstate and Defense Highways, able to carry 30 percent of all motor traffic.

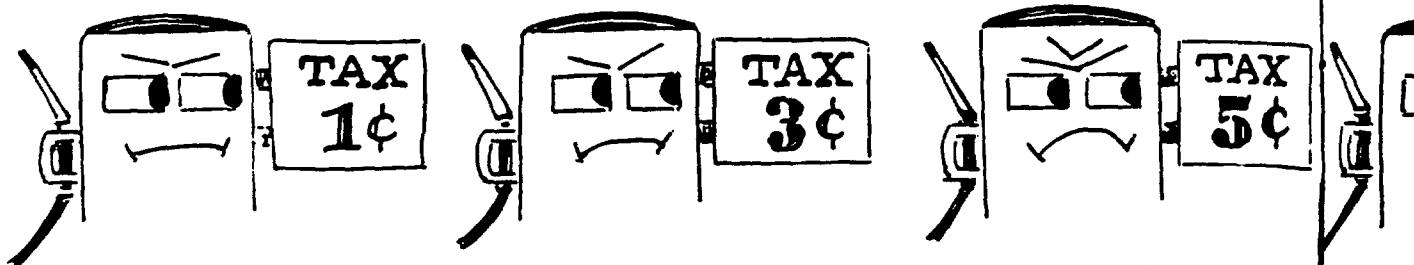
Such a system of fast superhighways sounds marvelous, doesn't it? Think of driving coast-to-coast without encountering a traffic light! I said the government "hopes to complete" this system in ten years. That is because a hitch has developed. Since the project was approved in 1956, its estimated cost has jumped from less than \$28 billion to nearly \$40 billion. And that estimate is expected to go still higher when the Bureau of Public Roads submits a new appraisal early next year.

As the result of these increasing estimates, the federal highway fund faces the prospect of going



PRICE INCLUDES
TAX 10¢
ON EACH GALLON

"If the tax story is not widely told, motorists, who now pay an average of 48 cents tax on every dollar's worth of gasoline, may have to dip deeper into their pockets."



into the red. Great pressure is being put on Congress "to keep the highway program on schedule."

The most common proposal to achieve this goal is that Congress continue the temporary one-cent-per-gallon federal gasoline tax increase which it put into effect in October 1959 and which is due to expire on June 30, 1961. Proposals also are being made that the temporary tax be made permanent and that the total federal tax be hiked above its present four-cent-per-gallon level.

On the surface, this would seem an eminently logical way to pay for these new expressways—let the user pay the cost through taxes, such as the motor fuel tax.

Those who take the trouble to look beneath the surface, however, are frequently amazed by what they find. This gasoline tax—to which government has turned whenever more road funds were needed—has reached truly alarming proportions.

Tax Equals Half of Retail Price

When the average state tax of 6 cents a gallon is added to the present 4-cent-a-gallon federal tax, we find that this combined 10-cents-a-gallon levy nearly equals the refinery cost of the fuel itself.

Moreover, this constantly climbing tax has actually reached the point at which it amounts to almost 50 percent of the retail price of the gasoline. As a result, we find ourselves faced with a tax rate on a basic commodity which has grown five times as high as the tax on luxuries. In other words, gasoline is taxed five times as much as diamonds and mink coats.

In view of these facts, one might conclude that the nation's motorists are either among the most docile taxpayers in history, or are so well-to-do that money means nothing to them.

Neither conclusion would be accurate. Motorists are just as tax-conscious as any other group. And the tremendous swing to high-mileage compact cars demonstrates that money—especially gasoline money—is important to them.

The explanation of this apparent contradiction is that a failure of communications has taken place.

People generally just don't know how high this tax has become.

The job of getting the facts to them is the responsibility of the petroleum industry and industries associated with it. If we fail to tell this story, no one else will.

If the tax story is not explained, American motorists, who now pay an average of 48 cents tax on every dollar's worth of gasoline they buy, may be called upon to dip still deeper into their pocket-books. They alone may be asked to defray the deficit on an interstate highway program that is being built to benefit everyone in the United States—including millions of people who do not own cars and therefore pay no gasoline taxes.

Since every resident benefits, motorists obviously should not be expected to carry the whole cost of such highway development programs.

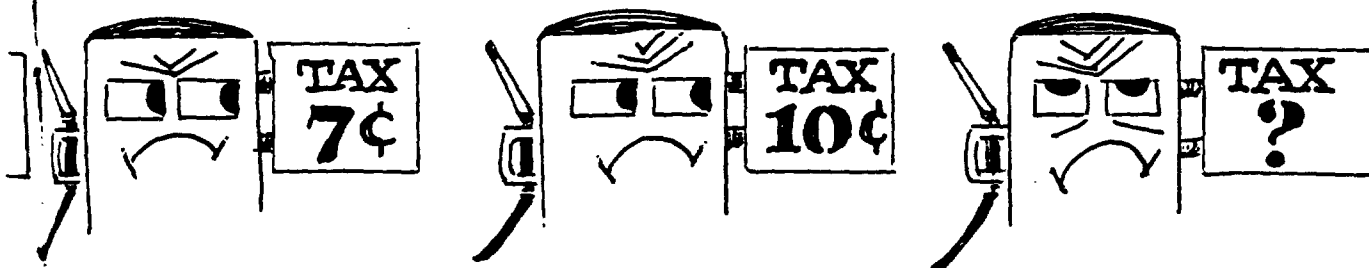
Moreover, motorists have a financial breaking point. They can't go on paying higher and higher levies indefinitely. Either they will be forced to cut expenses by driving fewer miles or they will switch over entirely to the more-miles-per-gallon compact cars. No matter which decision they make, further

If tax diversion were stopped, the highway program could be completed on schedule and the fourth cent of federal gasoline levy could be removed in June 1961.



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increases in gasoline taxes can be expected to bring less, not more money, into the highway fund.

This looks like a real dilemma, doesn't it? But there is a way out, if people will only think things through. The oil industry, which is second to none in its championship of good roads, is trying to explain the solution to the motoring public.

The thing most people do not realize is that federal gasoline taxes, *plus* excise taxes on automobiles, batteries, tires and other accessories, now raise approximately \$4 billion per year in revenue. That \$4 billion is considerably *more* than the total yearly cost of the new highway program. But here's the fly in the ointment: Only \$2.4 billions of these taxes go into the highway fund. The rest—some 42 percent—is channeled off into the federal government's *general* fund.

No Need for Increases

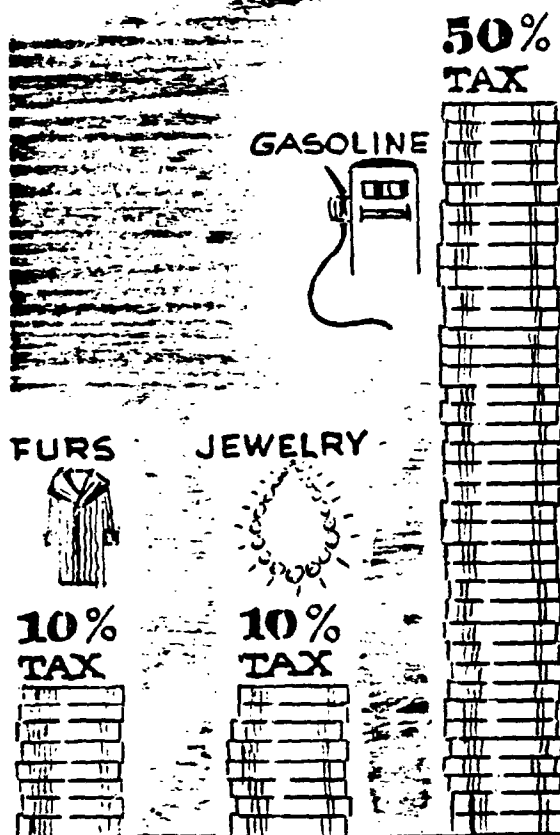
The point is that if the 42 cents of every federal tax dollar paid by motorists in special automotive taxes, which now are siphoned away into the general fund, were returned to the highway fund where they rightfully belong, they would more than meet the so-called "deficit" in this fund. Then Congress would be free to do what it promised it would—kill the temporary one-cent-per-gallon federal gasoline tax increase on schedule in 1961. Also, there would be no need for additional highway tax increases or for any cutback in the program.

What could be fairer than that? Motorists don't complain about paying their share of taxes for better highways. They just don't want those special automotive taxes used for non-highway purposes. The oil industry is highly in favor of an adequate highway system. As a good citizen it knows that good roads promote communication and progress, and it also realizes that, all things being equal, more highways mean more cars consuming more of its major product—gasoline.

It's up to everyone who is vitally interested in the health and progress of the oil business and who seeks to win friends for that industry, to do everything he can to explain what the diversion of auto-

mobile excise taxes means to motorists. At every opportunity, it should be pointed out that, if this practice is stopped, there'll be no need to continue the temporary federal gasoline tax past June 30, 1961, to increase the tax, or to stretch out the highway program beyond its original completion date.

Congress should be urged to end the diversion of highway tax funds and end the temporary gasoline tax. The fact that the cost of gasoline at the service station pump already includes ten cents per gallon in taxes, while the fuel itself actually costs only slightly more now than it did ten years ago, should be broadcast across the country. #





Filmed in full-color, movie sequences include actual refinery scenes, laboratory shots and animated drawings.

"DANGER! AIR!"

Ethyl produces new motion picture
to help promote safe
operations at oil refineries

By George H. Unzelman

AIR AND OXYGEN—so vital to life and so important in myriad manufacturing operations—can be a real hazard in oil refining. In the wrong place at the wrong time, air and oxygen can cause fire, explosion and a kind of super-explosion called detonation. The results, of course, can be damaging to refinery equipment and potentially dangerous to employees.

Because of its importance to safe refinery operations, the problem of handling air in process equipment is the subject of a new full-color motion picture just produced by Ethyl Corporation as a service to the petroleum industry. Appropriately titled "Danger! Air!," the movie will have its premiere showing at the annual meeting of the American Petroleum Institute in Chicago, November 14. It will be shown at an open session of the Division of Refining in the grand ballroom of the Conrad Hilton Hotel.

The new film is a companion to "Danger! Water!" produced by Ethyl two years ago and widely acclaimed by the oil industry.

"Danger! Air!" covers three broad areas: (1) It explains and demonstrates the hazards that can occur when air comes in contact with hydrocar-

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bons; (2) It shows safe equipment start-up procedures with respect to the problem of air; and (3) It presents accident case histories resulting from air in the wrong place at the wrong time.

Nearly a full year in the making, the 30-minute motion picture is designed for showing to refinery management, engineers, operators and safety men. It is based in part on the Standard Oil Company (Indiana) publication, "The Hazard of Air (Oxygen) in Refinery Process Systems," and was made possible by the cooperation of a number of oil companies.

Actual refinery scenes were filmed at installations of Richfield Oil, Southwestern Oil & Refining, Standard of Indiana, Suntime Refining and Tidewater Oil. Case histories were contributed by Cities Service, Socony Mobil and Standard of Indiana. Film clips were provided by Shell Oil.

Reviewed by Refining Authorities

In addition to on-location shots, laboratory demonstrations and animation are used extensively to help present the subject completely and clearly. Outstanding authorities throughout the refining branch of the oil industry helped plan the film and have reviewed and edited it.

"Danger! Air!" starts with a basic discussion of combustion. It shows how nitrogen, an inert gas which composes four-fifths of the air, does not support combustion of hydrocarbons by itself. Toluene, an example of a highly combustible hydrocarbon, does not ignite when mixed with nitrogen. When mixed with air, however, toluene vapors are shown to ignite readily, and in the presence of oxygen they explode violently.

Many ignition sources are demonstrated with live photography. While some of these sources can be eliminated, others—open flames, sparks, static, lightning and pyrophoric iron—are always present around refineries, the film points out. Since the fuel and ignition sources are of necessity present, the point is made that air, the third element required for combustion, must be constantly and vigorously controlled.

Start-ups and Shutdowns Critical

While air presents a hazard throughout refinery process operations, its presence is especially critical during equipment start-ups and shutdowns, the film explains. A typical crude oil fractionating unit is used to show the removal of air from a system prior to charging oil. Special precautions taken before the start-up of vacuum units and fluid catalytic crackers also are portrayed. Scenes of refinery equipment, control room shots, and animation help provide a well rounded picture of the steps involved.

The accident case histories incorporated in "Danger! Air!" are proof of the hazards that exist and the damage that can result from fires and explosions. Each illustrates specific potential danger. Many of the case histories are readily recognizable by oilmen throughout the country. They are included with the full knowledge and cooperation of the oil companies whose refineries were involved. The accident case histories were released for film use for their educational value and in the hope that they will help prevent similar accidents in the future.

That, too, is the purpose of the entire film. #



Here Come the Sparkle Girls

Union Oil employs corps of attractive young ladies successfully to promote service station cleanliness

By Henry F. Unger

A CORPS OF ATTRACTIVE YOUNG WOMEN is bringing a homemaker's touch to service station housekeeping in 12 western states—and the dealers love it!

There aren't any lace curtains in station windows or ruffles on gasoline hoses yet, but restrooms are cleaner, pump islands neater, uniforms sprucer, and smiles are quicker. The Sparkle girls—an innovation of Union Oil Company of California—bring home to dealers a basic fact of life: Never underestimate the power of a woman, nor the control she exercises over service station purchases.

The Sparkle program has just completed its second successful season. It was launched last year to help inspire dealers in the constantly recurring and unglamorous chore of keeping restrooms clean.

Union Oil service station operators—like others throughout the industry—have long received regu-

School teachers, secretaries and models are among the young ladies hired temporarily for Sparkle corps duty each year.



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the SPARKLE Girls

lar messages from the company about cleanliness. Union, along with other progressive marketers, preached the virtues of cleanliness—especially in restrooms—via bulletins and meetings. Then one day, convinced that a novel approach was needed, the company sent out pretty girls instead of memoranda. Attired in smart, feminine uniforms, the girls—young women in their twenties—became the spark of the Sparkle program.

The Sparkle corps took the positive approach. After inspecting stations and grading them for cleanliness, they rewarded dealers with good ratings, rather than criticizing those with poor ones. Service station operators registering scores of 90 percent and higher received prizes, and 1,400 awards were given in the two months of the program each year.

Prizes included complete new uniforms—right down to natty bow ties. To top it all, the dealer with the highest average score in each of the company's marketing areas received an engraved gold watch.

The Sparkle plan was an outgrowth of Union's

regular system of service station inspection. This is normally carried out by "sanitation and safety inspectors"—trainees in the company's supervisory training course. These men wear distinctive uniforms and drive spotlessly white, brightly labeled cars.

Neither the men nor the girls can order a dealer to improve his station's appearance. Helpful advice, offered tactfully, is their most effective weapon. "The buying public—especially the women—watch your housekeeping," is their repeated reminder.

Thoroughly Trained

Like the men, the Sparkle girls receive thorough training in service station housekeeping. Before the kickoff of the seasonal program, they are given an intensive course at Union's Los Angeles headquarters.

Most of the girls—hired temporarily for the duration of the program each year—are school-teachers, secretaries or from the public relations field. At least one, Joan Dettmar, who is pictured on these pages, is a model.

By her own admission, Joan felt awkward at

Sparkle girls inspect all service station areas and grade them for cleanliness. High ratings bring prizes.



ETC 29487

HERE COME THE SPARKLE GIRLS

first as a Sparkle girl. But this awkwardness soon vanished "because the men in the stations showed respect for my judgment—if not as an expert on service stations, at least as an expert on women."

Some dealers may have laughed when the girls first invaded what had always been a man's domain, but at the same time they were wiping off fingerprints and washing windows and mirrors. Like baseball players, they were concerned about their batting averages—as housekeepers.

Members of the Sparkle corps average a call on each station only about once every two weeks, but their presence lingers. There is no fixed route, but their sparkling white cars can be seen with ease. Cleaning equipment and supplies are rushed into action when they are known or even thought to be on the way.

Right, Sparkle girl Joan Dettmar includes a dealer's window display in her housekeeping check.

Below, Joan, like all other corps members, received instruction from regular inspectors.



8

The program has piled up all kinds of advantages for Union oil dealers, including newspaper, radio and television advertising and publicity, and they are sold on it. Company officials are sold on it too.

Here is what these officials say about it: "You can't get away from the fact that women influence 60 percent of the gasoline purchases. And you can't get away from another fact: the service station has always been a man's world and many women feel strange and uncomfortable when they drive in.

"We're sure we can overcome most of that uncomfortable feeling if we make our stations pleasant, neat and safe. And we're sure that when we please the ladies we're pleasing the most critical half of the family. That's the real objective of our Sparkle program."#

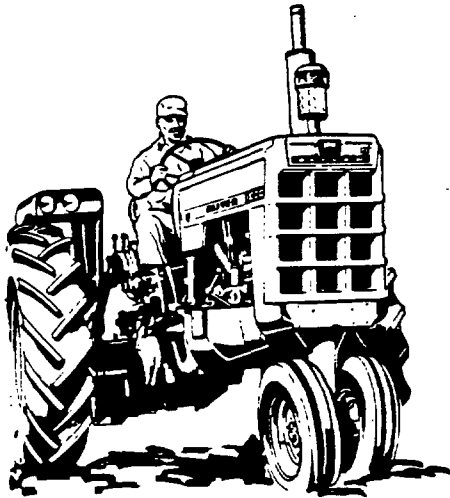


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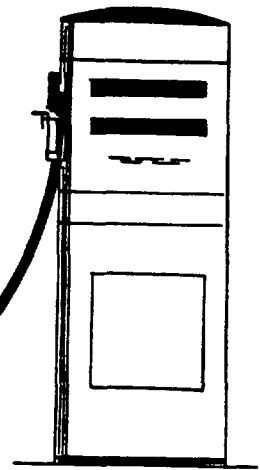
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PARTNERS IN POWER



Tractor manufacturers design new engines to take full advantage of gasoline quality

GASOLINE AND HIGH COMPRESSION, an experienced, efficient team with a long list of agricultural accomplishments to its credit, is constantly making new contributions to farm progress. One of the most advanced examples of this potent pair in action is found in the new "1800" farm tractor developed by Oliver Corporation and introduced this fall.

The competent fuel-engine combination that powers this tractor opens the way to sounder farm economics by assuring farmers of more efficient field operations. Proof of this was provided by standard Nebraska tractor tests. There, the "1800" proved itself the most efficient gasoline tractor on the market.

To this particular tractor and to lots of other farm progress, the oil industry is a major contributor. Much of the efficiency and outstanding performance of agricultural equipment has been made possible by constantly improving fuel and lubricant quality.

Progressive farm tractor manufacturers are using new materials and the latest design principles and techniques in their engines to take full advantage of the excellence of regular grade gasoline. They are making improvements in all engine areas and

parts to capitalize on octane number, volatility and other gasoline qualities. New standards of engine durability and dependable service are being achieved through the extra qualities of fuels and lubricants as well as through engine material and design improvements. Many of the petroleum product extras are supplied by additives which provide oxidation resistance, anti-icing, detergency, corrosion resistance, combustion control and deposit modification, and improved viscosity index.

New and Different

The new Oliver tractor comes in the 25th anniversary year of the manufacture of the first production model high-compression gasoline tractor—also an Oliver product. That pioneer, the Oliver 70, was dramatically new and different. It eliminated the problems and mediocre performance associated with heavier distillate fuels. Its new engine was designed to operate efficiently on the regular grade gasoline available—then about 70 octane number.

Now, further advances are here, as new highs in compression ratio and other innovations are built into new tractor engines to take full advantage of regular gasoline fuel quality and provide farmers with new levels of efficiency and performance.

PARTNERS IN POWER

The current new look in gasoline powered farm tractor engines is found under the hood of the big, powerful Oliver "1800" model. This tractor is designed to help the farmer do more work in less time at less cost—an economic necessity in this day of larger farms, increased labor costs and intense competition.

Many of the innovations in the new tractor's engine stem from experimental work done by Oliver and Ethyl Corporation engineers working cooperatively over a number of years. In recognition of Ethyl's contributions to this cooperative research, Oliver presented Ethyl with a special citation early this summer.

Specifically, many of the improvements in the new engine are adapted from the XO-121, the experimental 12 to 1 compression ratio tractor built in 1954 by the two companies.

Among the features of the new six-cylinder engine are: a seven-main-bearing crankshaft, an 8.5 to 1 compression ratio; and a specially designed fully-machined combustion chamber.

The engine is built with a two-piece cylinder head in which the top deck is separate from the main body. This assures uniform thickness of metal walls and permits complete inspection in production. It also eliminates cooling restrictions,



Outstanding performance by the experimental XO-121 tractor led to the incorporation of many innovations in the Oliver 1800's gasoline engine.

since all passages are free of fins, core sand and wires, and does away with hot spots.

Following extensive testing, a new "high lift" camshaft was incorporated in the engine to raise volumetric efficiency. The improved breathing results in increased power and economy.

Another innovation is the use of a new type head gasket to improve sealing and heat transfer. The gasket is designed to assure uniformity of compression ratio for better fuel utilization and smoother operation.

Smooth, Quiet Operation

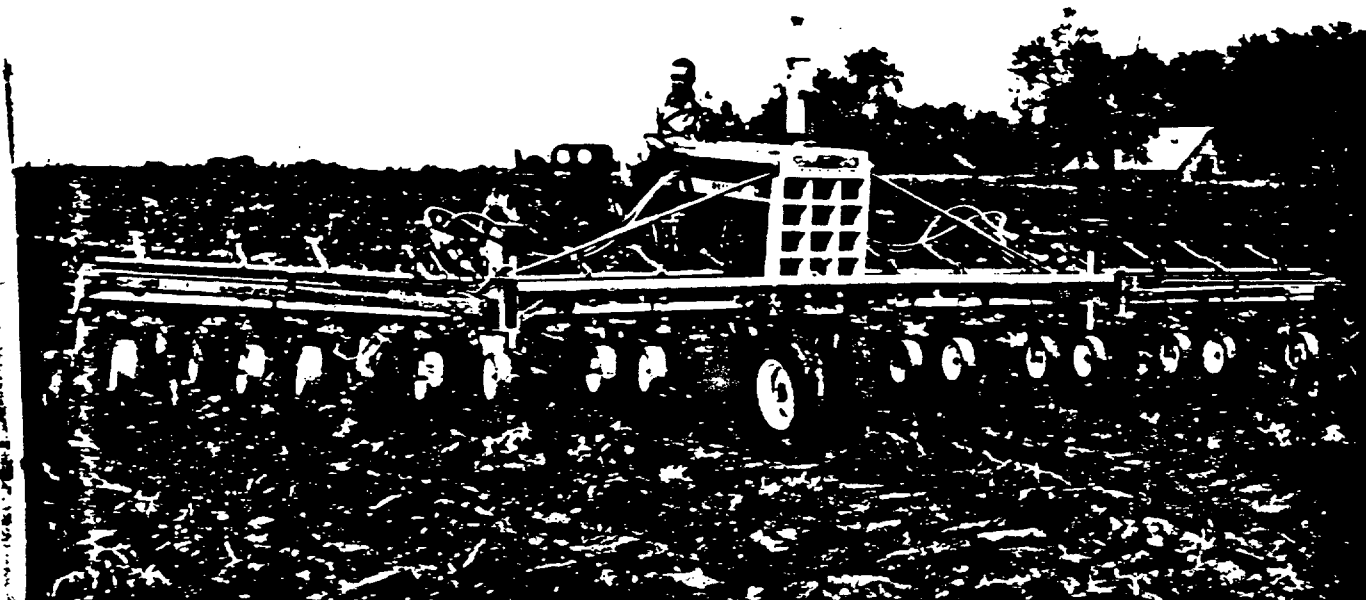
The engine's new crankshaft, with its seven main bearings, is made of hardened forged steel for added life and strength. With copper-lead bearings, it is designed to provide extra support, reduce friction and wear on internal engine parts and assure smooth and quiet engine operation.

The compact combustion chamber, called "Econo-Pak" in the Oliver tractor engine, is specially designed to help get the maximum power and economy out of present and immediate future regular grade gasolines. To make it compact, a portion of the chamber is in the concave piston head. The unique shape of the chamber insures good turbulence, fuel mixing and smooth power output.

The engine's 8.5 to 1 compression ratio is the highest of any gasoline tractor in the industry. With it, the thermal efficiency of the engine is outstanding. It converts more fuel energy into useful work. Together, these advances provide a new record in specific fuel economy for a gasoline tractor. In fact, the fuel economy of this tractor surpasses many of today's diesel tractors.

Among the engine's other features are: (1) Chrome plated top piston rings to resist scuffing and prolong the life of other rings; (2) Specially hardened exhaust valve seats; (3) New intake manifold for easier breathing and balanced fuel distribution, with a square section to prevent fuel from centrifuging out of the mixture; (4) Redesign manifold hotbox with a "hot spot" that vaporizes fuel effectively; and (5) Improved intake ports to assure good breathing and fuel distribution to all cylinders.

All the innovations in the new Oliver high-compression gasoline engine and the other new features of the tractor work together to achieve peak effi-



The new Oliver tractor is designed to do more work in less time at lower cost—on economic necessity today.

ciency and performance for the modern farmer. With economics a matter of increasing concern, the farmer naturally is interested in getting the most for his money.

The big, green and white, functionally-styled "1800" gasoline-powered Oliver is built to pull such tools as six 14-inch plows, a 22-foot disc harrow, an eight-row cultivator, five and six-row crop dusters, a 26-foot spring-tooth harrow or a 20-foot field cultivator. Using such equipment, the farmer can do his field work with a minimum of labor in less time at lower cost.

Gasoline, of course, has for years been the most widely used tractor fuel. One reason for this has

been its widespread availability and convenience in providing versatile and flexible tractor power. When such important factors as initial tractor cost, depreciation, taxes, insurance, interest, service and maintenance, lubrication, years to trade-in and hours of use per year are considered, gasoline has demonstrated time and again that it is the most efficient and economical source of power for most farmers.

Continuing improvements in gasoline and significant strides in tractor engines to take advantage of these fuel improvements assure the continued importance of gasoline power on the American farm. #



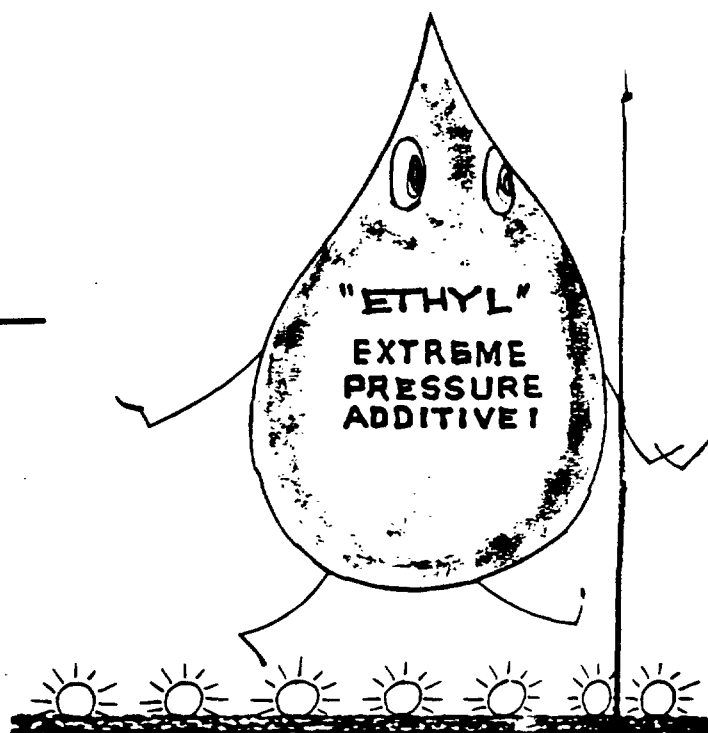
Field demonstrations displaying the new gasoline-powered unit's capabilities attract interested spectators.

Introducing— THREE MORE ADDITIVES

Extreme pressure additive, metal

deactivator and antioxidant

added to list of Ethyl products



THREE MORE ADDITIVES to improve fuels and lubricants have recently been added to Ethyl Corporation's growing list of products for the petroleum industry. The additives are "Ethyl" Antioxidant—ZDP, "Ethyl" Metal Deactivator, and "Ethyl" Extreme Pressure Additive 1.

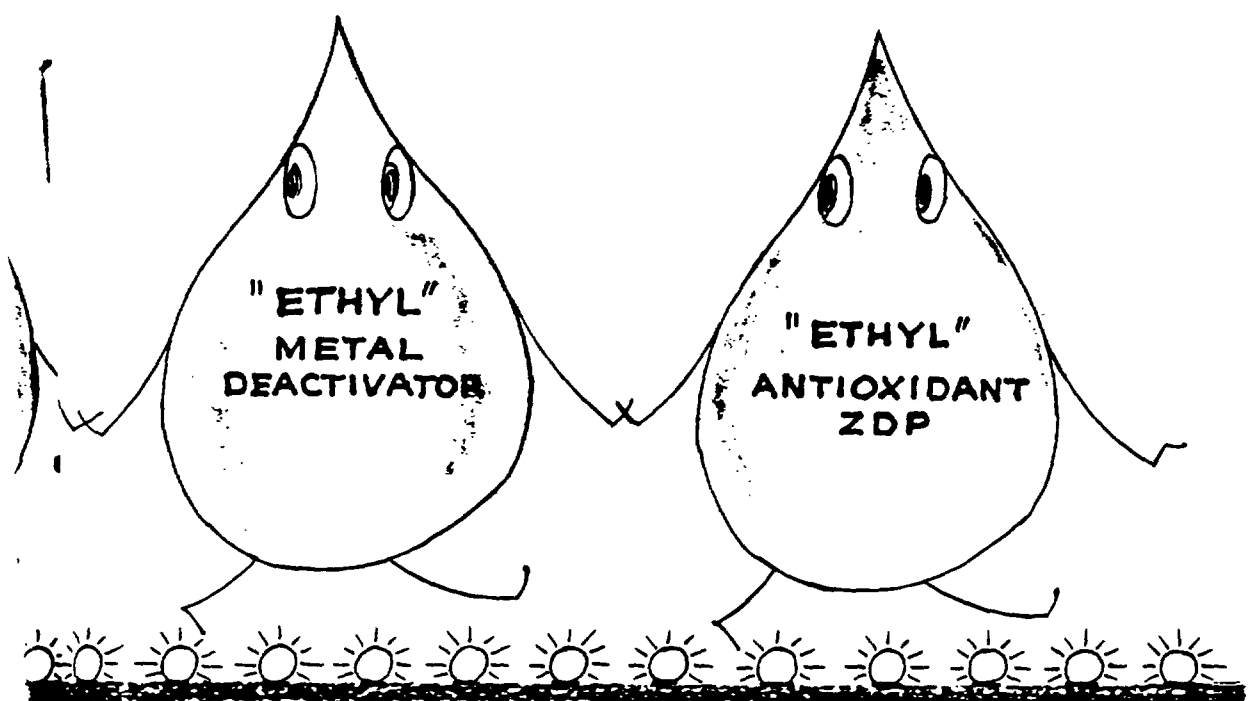
The introduction of these chemical compounds increases to five the number of new Ethyl products the Company has offered since spring. The other two are tetramethyl lead, a companion antiknock compound to tetraethyl lead, and "Ethyl" Ignition Control Compound 4, a low-cost phosphorus additive for controlling spark plug fouling, preignition and rumble in gasoline engines.

Protects Engines

One of the three newest additives, "Ethyl" Antioxidant—ZDP, when added to lubricating oil, acts as a mild extreme pressure additive as well as an antioxidant. It protects engines against cam and lifter wear.

"Ethyl" Metal Deactivator, a chelating agent, is added to gasoline, jet fuels and distillates to counteract the harmful effects of copper. By combining chemically with copper particles, it nullifies their tendency to promote oxidation in fuels.

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Chemically, "Ethyl" Antioxidant—ZDP consists of zinc dithiophosphate, while "Ethyl" Metal Deactivator is N, N'-disalicylidine propylenediamine. Both compounds are widely used in lubricants and fuels because of their proven effectiveness in their respective applications.

"Ethyl" Antioxidant—ZDP and "Ethyl" Metal Deactivator will be sold as separate additives. The metal deactivator also will be available in combination with "Ethyl" Antioxidant 733 as a combination additive for gasoline and jet fuels.

The third new product offered by the Company, "Ethyl" Extreme Pressure Additive 1, is designed specifically for use in automotive transaxle fluids, in gear lubricants and in cutting oils.

Adding EPA 1 to a conventional automatic transmission fluid enables the fluid to meet the extreme pressure requirements of rear axle hypoid gear oils. This means that the product may lead to a single lubricant for automatic transmissions and rear axles. Separate lubricants are now required.

EPA 1 may also be valuable as an additive for transaxle fluids. Transaxles, which are a combination transmission and rear axle mechanism, are of increasing interest as possibilities for improving future automobiles.

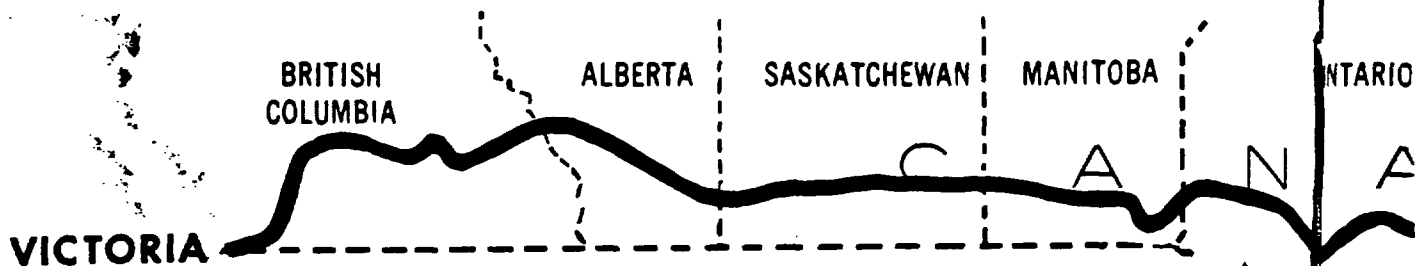
In addition to giving lubricating oils more desirable characteristics, "Ethyl" Extreme Pressure Additive 1 also is compatible with other transmission fluid additives and does not promote oxidation. In gear oils, the product adds load-carrying capacity for protection against wear under high speed and high shock conditions.

Lengthens Tool Life

In cutting fluids, EPA 1 makes possible outstanding performance in drilling and tapping titanium and other difficult-to-machine metals. It improves surface finish, lengthens tool life and does not stain copper alloys.

EPA 1 is composed of a mixture of chlorinated phosphorus compounds. It is being made available in development quantities.

With the new products now available, Ethyl's line of additives includes antiknock compounds, ignition control compounds, a multi-purpose additive for controlling carburetor icing, carburetor deposits, and corrosion; a diesel fuel cetane improver; antioxidants for fuels and lubricants; a metal deactivator for fuels, and an extreme pressure additive for automotive and industrial uses. Ethyl also markets a full range of gasoline dyes. #



Completion of the Trans-Canada Highway and other road-building projects are helping to develop the vast country . . .

from Victoria to

By Thom Yates

EVEN LOYAL CANADIANS, proud of their booming nation's recent advancements, find it hard to believe that it was not until 14 years ago that anyone ever drove an automobile completely across Canada. The reason why the 5,000-odd miles had never before been negotiated by a motor vehicle entirely on Canadian highways is simple: For several long stretches, only dirt or gravel roads existed and in a few spots there were no roads at all to speak of. The result was that anyone who wanted to drive coast-to-coast, from the Maritime Provinces to British Columbia, or vice versa, usually dipped down onto United States highways in order to bypass the "road poor" areas north of the border.

But this condition is a thing of the past—or is rapidly becoming so. With the same efficiency that characterizes its rapid growth and development in so many other areas, Canada is engaged in a vast road-building program. In this decade, the program will give the country a network of highways that will speed motorists on their way and open up parts of the country previously inaccessible by car.

Most spectacular of the highways under construction—although not necessarily the most important from the nation's economic standpoint—is

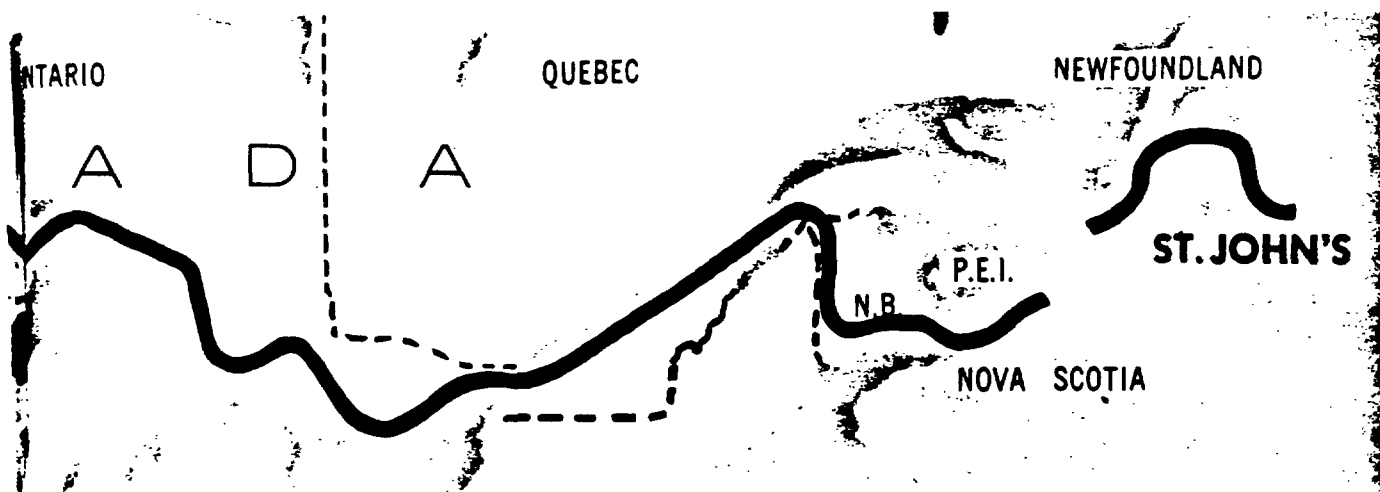


The Trans-Canada Highway is the longest unbroken stretch of highway ever built by one country.

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to St. John's

the Trans-Canada Highway. When completed—1963 is the target date—this route will provide Canada with its first continuous east-west thoroughfare, reaching from St. John's, Newfoundland, to Victoria, British Columbia. It will represent the longest unbroken stretch of highway ever built by one country in the history of the world.

The highway is "unbroken" only in the technical sense, however. There are no plans to build bridges between Newfoundland and Nova Scotia, between Nova Scotia and Prince Edward Island, or across the Strait of Georgia from Vancouver to Nanaimo and Victoria, British Columbia. It will be necessary to "drive" those parts by auto ferry.

Surfaced with Asphalt

The new coast-to-coast route is not a superhighway in today's sense of the word. For the most part it is a two-lane highway with a maximum width of 24 feet, and 10-foot shoulders on either side. But motorists are assured of a smooth ride, since virtually all of the highway will be surfaced with several inches of asphalt.

As it stands now, the transcontinental highway is 73 percent completed, insofar as paving is concerned. The remainder—something like 1,100 miles

—is passable, but not surfaced, with two notable exceptions.

One of the major gaps lies in the wilderness of northern Ontario from the Agawa River, about 90 miles north of Sault Ste. Marie, to Marathon, a new papermill community on the north shore of Lake Superior. It is 164 miles from Agawa River to Marathon and the country is rugged and forbidding. But, mile by mile, the engineers have been conquering nature and expect to have this long stretch completely graded by year's end.



Many tourist attractions and some of North America's most breath-taking scenery border the highway.

FROM VICTORIA TO ST. JOHN'S

The other gap is along the Alberta-British Columbia border through Glacier and three other neighboring national parks. There, avalanches of rock and snow are the big enemy and the constant fight against them has skyrocketed the cost of the Trans-Canada Highway in the area to about \$1 million per mile. But the results will be well worth the effort, for the new route will cut approximately 100 miles off the present looping roadway.

In recent months, Quebec became the last province to enter into the Trans-Canada Highway agreement with the federal government. Up to this time Quebec had been, administratively speaking, a "gap" in the route. This was of little direct concern to motorists, however, since the province has adequate stretches of pavement that serve as convenient links with the Trans-Canada Highway.

The need for a transcontinental highway, long recognized and advocated by the Canadian Good Roads Association, was highlighted during World War II with its complex military movements. It became just as apparent that such an undertaking was too expensive for the provinces to tackle by themselves without financial aid from the federal government. In some instances, federal assistance on portions of the highway built so far amounts to

as much as 90 percent. Total cost of the project to date is in the neighborhood of \$750 million.

There are several reasons why the country only recently has undertaken its herculean road-building effort. The ruggedness, even the wildness, of many parts of the nation; generally sparse population away from the larger cities; extreme variations in climate—these are some of the deterrents. Too, as a growing nation, Canada has in the past been more concerned with building highways that led toward the United States border or into once-remote areas.

Also, there were local situations such as prevailed, for instance, in Newfoundland. When this island became a Canadian province in 1947, it had only 70 miles of paved highway. Its residents were traditionally a seafaring people to whom road transportation meant little or nothing.

New Stretch in Newfoundland

Now the situation is changing. The big airport at Gander and the desire of more and more tourists to see "different" Newfoundland will result in completion of a 656-mile stretch of the Trans-Canada Highway in a wide arc across the province from St. John's, the capital and eastern terminus of the transcontinental roadway, to Port aux Basques, the auto ferry point of departure for the mainland.

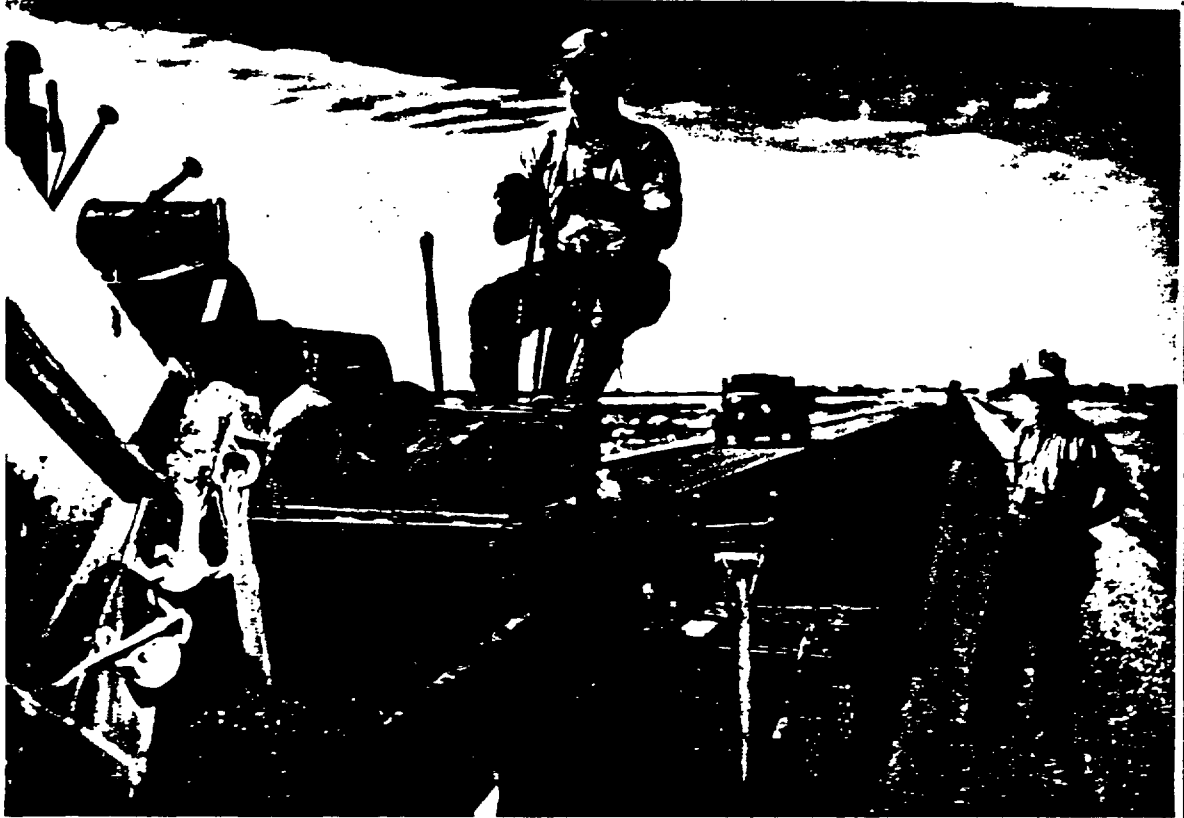
Besides the Trans-Canada, other new highways are being built and existing ones improved and extended in all the provinces. One of the most impressive programs is transprovincial highway No. 401 in Ontario. This is a modern four-lane dual highway constructed on a 300-foot right-of-way. Much of 401 already is in use and new sections are steadily being opened. When completed in 1963, this expressway will extend 500 miles and bypass all urban communities en route. On it, Montreal and Detroit will be but a comfortable day's drive apart—something undreamed of only a few years ago.

Another notable example of Canada's highway facelifting is its "roads to resources" program. This cooperative undertaking between the federal and provincial governments is designed to build 4,000 miles of new roads.

The roads will not be a part of Canada's public transportation system nor will they be superhighways. In the words of Alvin Hamilton, Canada's Minister of Northern Affairs and National Resources, they will be thoroughfares "as good only



Rugged, forbidding country challenges engineers and construction crews on much of the Trans-Canada route.



Motorists are assured of a smooth ride, since practically all of the highway is paved with asphalt.

as they need to be for the purpose for which they are intended." That is to open up new areas of the nine-tenths of Canada which still is outside the present range of economic development.

While mining, forestry, fishing and recreation are the principal resources that will benefit, tourism also stands to gain. In the Atlantic provinces particularly, "roads to resources" will open up new vacation areas and improve access to existing ones.

At the same time, the federal government, on its own, is presently engaged in a program of development roads in the Yukon and Northwest Territories, quite apart from the "roads to resources" project. These new highways in the northern territories will, in the main, open up mining and oil and gas areas as well as provide improved access with the lower part of Canada.

If the world marvels at the nation's progress in recent decades, it will undoubtedly find even more to wonder at as Canada continues its forward march in the years ahead. Through its ambitious road-building program, many of the three million square miles in the country's north, now inhabited only by wildlife, will come under development. Opening up this vast area will help Canada capitalize more than ever on her treasure chest of goods and materials. #



Extensive road-building programs will make Canada's colorful attractions more accessible.



Product service engineer Jack Wallis is concerned with the safe, efficient handling of "Ethyl" antiknock compounds in the field, all the way from unloading to blending. His job includes helping with the design and efficient operation of mixing systems and equipment.

Meet Ethyl's J.

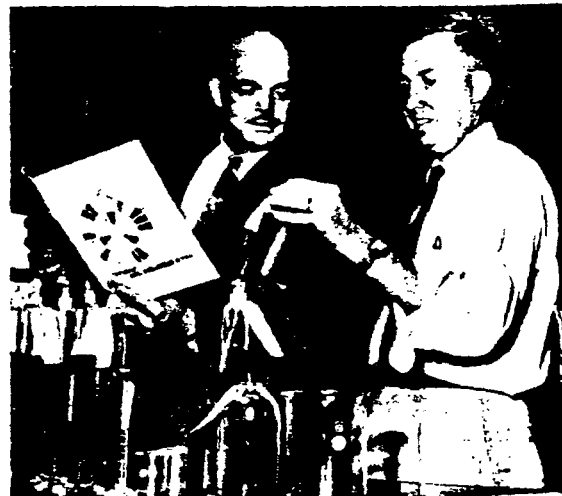
He and other product service engineers are on the job wherever "Ethyl" antiknock compounds are used

PRODUCT SERVICE is his job. And that means just what it says.

As a senior service engineer in the Chicago area, Jack Wallis provides the kind of specialized service that saves dollars for his customers in the efficient and safe handling of "Ethyl" products.



Suggesting time-saving techniques of product handling, Jack presents a summary of Ethyl improvements in procedures and equipment, designed to streamline handling methods. In the past several years, Ethyl has developed a number of ways to save manpower.



In the laboratory with a customer, Jack puts his chemical background to good use in discussing the advantages of Ethyl's newer dyes. Backing up his own experience, Jack has the facilities of Ethyl's specialized dye laboratory to help with dye problems.

Jack Wallis

He does all this in many ways, some of which are illustrated here. His specialty, however, is in the equipment end of handling and mixing tetraethyl lead.

It's taken Jack 21 years of Ethyl experience to become as highly qualified as he is today. A graduate with a bachelor of science degree in chemistry and chemical engineering from the University of Delaware, he started as a control shift chemist in the manufacturing department.

He became an Ethyl product service engineer back in 1950, and since then has applied his skills directly for the benefit of Ethyl customers. Aside from his regular job, Jack is also very active in various phases of API safety work.



Checking a storage tank at a refinery, Jack gets right inside for a thorough inspection. One of his responsibilities is to help oil companies establish and maintain safe procedures for cleaning tanks which have contained leaded gasolines.



Commending an innovation designed to aid in fast, uniform mixing of antiknock compound with gasoline, Jack and another man plan the installation of an Ethyl designed free jet mixing nozzle. This improvement makes use of existing equipment and piping.



Presenting a new blending development, Jack is showing photographs of an improved, automatic stop-weight blending system which he personally developed. It adds a predetermined amount of antiknock compound to a blending tank without manual control.

Mr. President Goes M



White House automobiles span an era from Stanley Steamer to bubbletop limousine

By Frank L. Remington

WHEN THE NEW PRESIDENT steps into an automobile to drive to his oath-taking ceremonies next January 20, he'll become the eleventh chief executive of the automotive age—but only the seventh to ride to his inauguration in a motor vehicle.

The motor car had been a part of the American scene for more than two decades before 1920, but until that year lingering tradition and safety precautions dictated that incoming and outgoing presidents be conveyed to the Capitol steps ceremony by a "coach and four." Thus, Warren G. Harding became the first chief executive to be ushered into office by automobile.

Such tradition and "concern" about the president's traveling by car have long since been forgotten, of course. As it is everywhere else, the automobile is an accepted part of inaugural parades.

Meanwhile, it is intriguing to see how cars gradually displaced horses from the White House stable and how important the succeeding garage has become.

Grover Cleveland was occupying the White House in 1893 when Frank Duryea made the first successful move to put America on wheels with his gasoline buggy. But as president, Mr. Cleveland never rode in one of the new-fangled contraptions.

In 1899, William McKinley became the first chief executive to ride in an automobile—a Stanley Steamer. Apparently, he didn't enjoy it, for he afterward admitted that he had expected to be blown to bits at any minute.

True to the Horse

Theodore Roosevelt followed McKinley and, as an ex-Rough Rider, remained true to the noble horse most of the time. T.R. did recognize the practicality of the motor vehicle, however, and rode in one occasionally.

William Howard Taft, the next president, was an ardent motorist and the first president to have an official auto fleet. The first White House car was, appropriately enough, a White Steamer. Taft later acquired a Pierce-Arrow for his wife's use.

He did not drive himself, but the portly president

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knew something about mechanics and liked to give technical advice to his driver. One day, when his car broke down on a country road, the president chided the chauffeur for failing to fix it promptly. Thoroughly exasperated, the driver is reported to have heatedly turned on the president and told him to find the trouble.

"You're the mechanic," the chauffeur blurted out. "All I do is furnish the muscle power and get smeared with grease."

Taft is said to have taken the rebuke good humoredly and refrained from kibitzing on repairs after that.

The World War I president, Woodrow Wilson, has the distinction of being the only president to use an electric car. The second Mrs. Wilson owned one and frequently took him riding. But the 16-mile-an-hour maximum speed of the electric, together with its short cruising range, caused the first family to give it up for gasoline-powered cars.

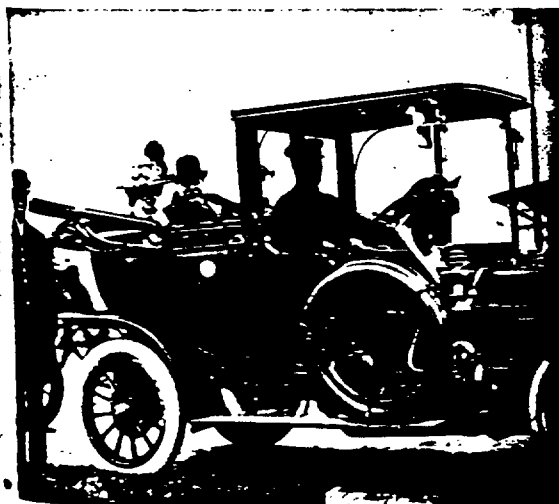
Following Warren Harding's automotive inauguration, the White House auto fleet grew to five vehicles, as the motor car established new records of dependability and popularity in the 1920s. Un-

like his predecessors, Harding was a qualified driver himself and owned a car of his own, but he found little use for it during his abbreviated term of office.

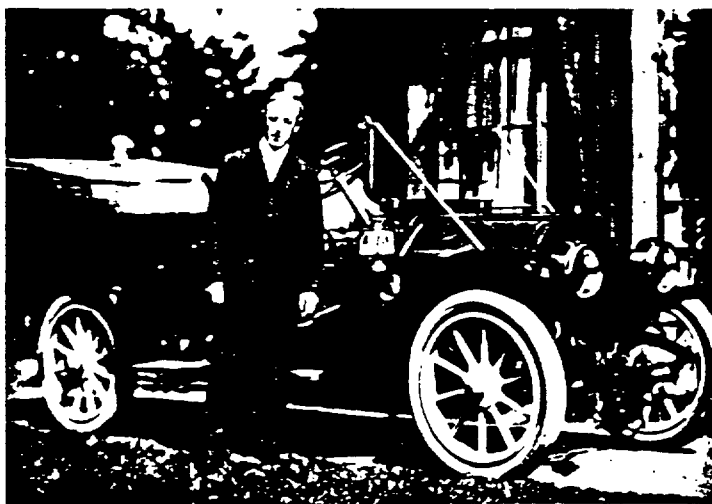
It's not surprising that Calvin Coolidge ranks as the most conservative motorist among the presidents. Though he rarely spoke to his chauffeurs in sentences of more than three words, he was a persistent back-seat driver. "Silent Cal" crisply called attention to every potential hazard along the road and insisted on strict adherence to all highway and traffic regulations.

FDR's "Sunshine Special"

During Franklin D. Roosevelt's administration of the 1930s and '40s, the New Deal president frequently rode in the "Sunshine Special." A 9,300-pound luxury convertible, the "Sunshine" boasted a 160-inch wheelbase, thick armor plate, and bullet-proof windows and windshield. It carried the president through the streets of Washington, Chicago, Yalta and Casablanca, and it went to South America and the Near East. It probably acquired its name from the fact that F.D.R. often took it South and enjoyed it in the warm weather.



President Taft, an inveterate horseless carriage fan, with his First Lady, sets out for an afternoon spin.



Woodrow Wilson gave up his wife's electric in favor of faster, wider ranging gasoline-powered vehicles.

MR. PRESIDENT GOES MOTORING *****

The "Sunshine Special" also became a favorite of President Truman. Here and abroad, he put on much of the car's 55,000 miles. After 11 years of illustrious service, the much traveled vehicle was retired to the Edison Institute Museum at Greenfield Village, Dearborn, Mich.

In the eight years since President Eisenhower took office, the White House has acquired a variety of automobiles—many of them custom built, including the president's now-famous "bubbletop."

This plexiglass-roofed limousine was made so

that Ike could be seen easily and yet remain protected—even in inclement weather. This car has been shipped to many parts of the world and used by the president on his personal diplomacy missions.

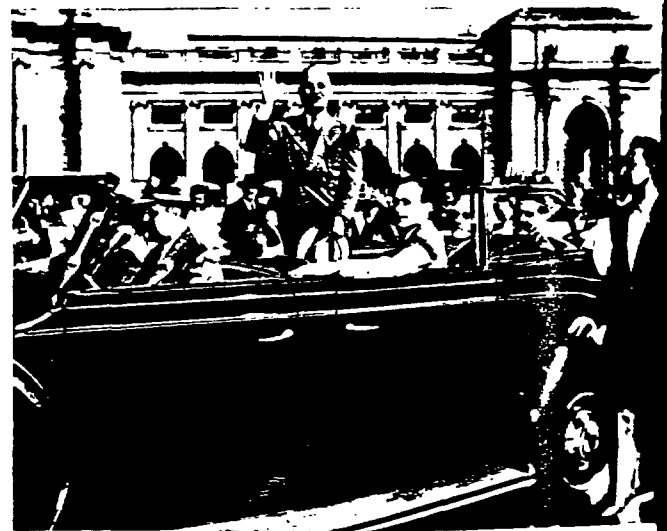
As they have been for some years, presidential cars are leased directly from major automobile manufacturers for sums ranging from \$50 to \$500 a year. The leasing arrangement is quite a bargain for the government, since it usually includes free servicing, tire maintenance, body repairs and replacement of parts. Car manufacturers, however, are forbidden to publicize or exploit presidential use of their automobiles.

For security reasons, the exact number of cars in the White House fleet cannot be disclosed, but estimates put it at from 30 to 40—including those used by the Secret Service in protecting the president. Many of the drivers are Army personnel in White House chauffeurs' uniforms.

Even in recent years, presidents have not done much driving themselves, since the Secret Service frowns on it. Occasionally, though, one gets behind the wheel.



Left, in the rear seat of a spacious touring car, Calvin Coolidge accompanies Herbert Hoover to the latter's inauguration in 1929 . . . Below left, Franklin D. Roosevelt uses hand controls to drive members of his staff on a visit to patients at Warm Springs, Ga. . . . Below, Harry Truman stands to wave to admiring crowds from the "Sunshine Special."



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F.D.R. enjoyed driving his own car, though his physical infirmity prevented him from doing so on a public highway. He used to drive a specially built phaeton, with hand controls, around his Hyde Park estate and at Warm Springs, Ga.

Speeding Frowned On

Harry Truman once drove from Charlottesville, Va. to Washington. Newsmen following behind clocked him at 65 miles an hour. The Secret Service took a dim view of the speed and the attendant publicity and persuaded Mr. Truman to let someone else do the driving after that.

In the interest of security, the Secret Service also sees to it that the president and vice president never ride in the same automobile. This and some of the Secret Service's policies may seem overly cautious, but results vouch for their merit: A president of the United States has never suffered an injury while riding in an automobile. #

BEFORE THE AUTOMOBILE . . .

the government furnished housing for presidential horses and carriages, but supplied neither the animals nor the vehicles they pulled. Mr. President paid for his own.

Chester A. Arthur was the owner of two perfectly matched mahogany bays, and Grover Cleveland had a stable of five horses, including three matched browns. Theodore Roosevelt maintained two carriage teams, six saddle horses, and a landau, brougham, surrey, and a small open trap.

President Taft had the one-story, brick White House stable remodeled into a garage, replacing the feed bin with a gasoline tank. But it wasn't until 1951 that Congress—apparently convinced that the automobile was here to stay—passed a bill officially abolishing White House stables. Until then, there was a law requiring the Quartermaster General of the Army to provide suitable quarters for presidential horses.

FOOD FOR AMERICA'S FUTURE

THE COUNTRY'S ABILITY to feed its fast-growing population in the years ahead is discussed in "Food for America's Future," a new book produced by Ethyl Corporation as a public service. The 167-page volume tells what has been done, what is being done, and what will be done to better equip farms and industries to meet the food needs of future generations.

Looking ahead, the book discusses land capability and the part agricultural research will play. It outlines the goals education should strive for in this field, and gives details for more efficient management of land, labor and capital. Coverage is extended to recent and anticipated chemical and other technological developments for more effective control of insects, diseases, and weeds, and for more productive fertilization of land.

Increasing productivity through power farming, the availability of petroleum products for fueling and lubricating equipment, and the part electricity will play in the business of farming are other areas discussed. Finally, the book considers problems facing the farmer, and explains how their solution will contribute to his future productivity.

"Food for America's Future" was conceived and produced by Ethyl to allay some of the concern caused by the country's unprecedented population explosion. Aware that there are doubts about our food potential, the Company went to outstanding

authorities in research, soil science, education, petroleum, farm machinery, electric power, agricultural chemicals, economics, food processing and marketing. The Company asked these men about the prospects for feeding an estimated population of 245 million in 1975—and even greater numbers in succeeding years.

"Food for America's Future" is the result. Its 12 related articles were written by Firman E. Bear, Editor-in-Chief, *Soil Science*; Byron T. Shaw, Administrator, Agricultural Research Service, U. S. Department of Agriculture; Thomas A. Boyd, Consultant, General Motors Research Staff; Clifford M. Hardin, Chancellor, University of Nebraska; Herrell G. DeGraff, Babcock Professor of Food Economics, Cornell University; Richard C. McCurdy, President, Shell Chemical Co.; Kenneth S. Adams, Chairman of the Board, Phillips Petroleum Co.; Robert S. Stevenson, President, Allis-Chalmers Manufacturing Co.; Robert E. Wilson, Chairman of the Board (retired), Standard Oil Company (Indiana); Philip D. Reed, Chairman of the Board (retired), General Electric Co.; Charles G. Mortimer, Chairman and Chief Executive, General Foods Corp.; and Charles B. Shuman, President, American Farm Bureau Federation.

"Food for America's Future" is published by the Industrial and Business Book Department of the McGraw-Hill Book Company.

ETHYL IN THE NEWS

Company Building New Gasoline Testing Laboratory



A NEW GASOLINE TESTING LABORATORY, located in the Los Angeles refining area and designed to provide improved service to refiners throughout the Pacific Coast, is being built by Ethyl Corporation at Long Beach, Calif. The laboratory, which will be equipped to provide "same day" test results, is scheduled to be in operation early next year. It will replace Ethyl's present laboratory at San Bernardino, Calif., without any interruption in the Company's service.

The new laboratory at Long Beach will contain the latest equipment for testing all phases of gasoline quality and will be fitted to test diesel fuels for cetane number. Experienced Ethyl technicians will

test gasolines for Research and Motor octane numbers and for antiknock compound content, specific gravity, oxidation stability, vapor pressure, distillation and corrosion characteristics, and gum and sulphur content. Special tests, such as trace lead and bromine number determination also will be performed.

The Ethyl technicians will be available to work with oil company personnel, on a cooperative basis, on educational programs involving gasoline testing procedures. They also will assist on the servicing of knock-testing engines and related equipment.

Collectively, the five laboratories in Ethyl's Gasoline Testing division annually test some 30,000 gasoline samples sent in by refiners and purchased at service stations in principal marketing areas. The laboratories' tests supplement those performed by individual oil companies and also develop data used in Ethyl's monthly nationwide surveys of gasoline quality.

Ethyl-engineered Jet Mixing Systems in Wide Use

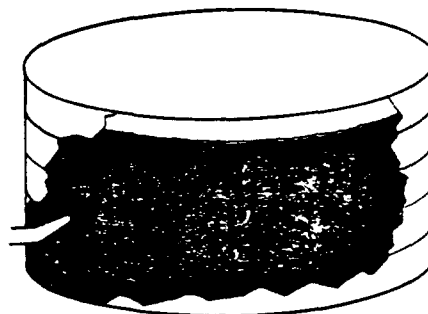
JET MIXING SYSTEMS, engineered by Ethyl Corporation for combining antiknock compounds with gasolines, are proving so advantageous that more than 100 refineries are now using them.

Consisting primarily of a nozzle fitted through the side of a storage tank of any size, with the spout angled upward and toward the tank's center, an Ethyl jet system adds gasoline-diluted antiknock fluid under pressure supplied by a pump. Mixing takes place when the high-velocity nozzle stream agitates a tank's contents completely.

In addition to low initial and operating costs, advantages of the system include sharp reductions in the time required for blending. It takes only two hours or less to process a tank of 134,000-barrel-capacity, for example, instead of some 30 hours by swing line circulation or other installations. The resulting speedup in product turnover means a commensurate increase in tank farm utilization.

Jet mixers for treating gasoline appeal to refiners with problems which cannot be solved by installations of other kinds. At the same time, the newer system can be applied with equal economy and efficiency in combining various gravity crudes or to mix additives with other petroleum products.

Ethyl representatives are available to explain jet methods to oil companies, provide engineering design and system analyses, assist in the solution of individual mixing problems and cooperate on installational and operational procedures.



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Scientists Present Papers at ACS National Meeting

POTENTIAL ways to increase the usefulness of various metals and organometallic compounds were discussed in seven technical papers presented by representatives of Ethyl Corporation's Research and Development department at the 138th national meeting of the American Chemical Society in New York during mid-September.

At one of the ACS sessions, Dr. Thomas P. Whaley described how sodium can be applied to make such space-age metals as titanium, zirconium, niobium and vanadium in commercial quantities.

A recent Ethyl method for producing tetraethyl lead by an experimental laboratory process

was explained in the paper prepared by Dr. Julian B. Honeycutt, Jr. and James M. Riddle for the ACS organic chemistry division. They also described the preparation of new organo-boron compounds. Specialized aspects of tetraethyl lead and tetramethyl lead production were covered by Dr. Warren E. Becker and Shirl E. Cook.

Three other papers on reactions involving metallic compounds were presented—the work of Joseph H. Mitchen; Allen H. Filbey, Kestutis A. Keblys and John H. Wollensak; and Michael Dubeck and Richard L. Dreibelbis. John C. Lane was a speaker at a meeting of the division of chemical literature.

George H. Unzelman Named Chief Refinery Technologist



GEORGE H. UNZELMAN, who has been associated with the oil industry for the last 13 years, has been named chief refinery technologist in Ethyl Corporation's Western region.

Mr. Unzelman, who will make his headquarters in Los Angeles, joined Ethyl in 1955. Since that time, he has been a member of the Refinery Technology division at the Company's research laboratories in Detroit, a refinery technologist in Tulsa, and for the last two years, technical assistant in Ethyl's Advertising and Sales Promotion division. In the latter capacity, he has been responsible for the production of "Danger! Water!" and "Danger! Air!" motion pictures on safety in refining operations. He also has contributed numerous articles on refining subjects to oil industry publications.

A native of Seattle, Mr. Unzelman received his B.S. in chemical engineering at the University of Washington. Before joining Ethyl, he was with Continental Oil for eight years

Magic Circle Ad Presented to Minnesota Governor



Gov. Orville L. Freeman of Minnesota (left) receives enlargement of Ethyl Magic Circle ad featuring Minneapolis-St. Paul area from Clyde Port, Mobil Oil, and Harold Berg, Ethyl Corporation.

Deep in the heart of the Texas hill country,
history and scenic beauty are intermingled in

Mounted on sure-footed horses, today's ranch
guests follow the historic road where it turns
in and out of the river as topography dictates.



• • A ROAD, a



DEEP in a strikingly beautiful canyon, in the rugged hill country 125 miles northwest of San Antonio, Texas, is one of the most unusual roads in the country. It's under water!

For years, the broad rock bed of the spring-fed Frio River has served as a thoroughfare, even though it is almost always under at least several inches of water. And yet, because it is hard-surfaced, the route never has been repaired. The combination riverbottom-road is a part of a far-reaching bed of native limestone that stretches, strata on strata, across miles of that part of the Lone Star State. It probably was the first dustless road in Texas.

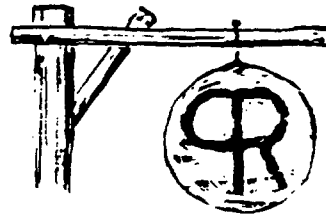
The unique aspects of the road don't end with its water cover. It has been a vital connecting link for three county seats: Leakey, in Real County; Rocksprings, in Edwards County; and Kerrville, in Kerr County. Although for years, in fact for decades, it was a state highway—the only passable north-south route—it actually is privately owned. The road, and that part of the Frio River through which it runs, are within the boundaries of 10,000-acre Prade Ranch.

The River's Story

If modern automobile travelers of the Frio canyon route could understand the rippling sounds of the crystal-clear river, they would hear a fascinating story—a story of boundless beauty, a story of history and hardship, and, more recently, a story of ranching, recreation and relaxation. For the river has seen all these things—and more.

Worn deep in the terra-cotta-colored limestone riverbed—and still clearly visible in several places—are parallel ruts. These ruts were started back in

),a RIVER and a RANCH



the 1860s, and deepened over succeeding years. They were ground into the stone by iron tires on the wagons driven by hardy Texas settlers in the post-Civil War years.

Although a modern highway, Route 336, weaving in and out along hilltops at the head of numerous canyons, now parallels the old road, guests at Prade Ranch and other motorists still like to drive the watery route. There they can enjoy the beauty of the towering Frio canyon with its multi-colored rock strata and countless mud-compacted swallows' nests, have the fun of driving the underwater highway, and recall the days of Texas pioneers.

Signs Marked Channel

It was only a few years ago that the old road was the only one—even for motor vehicles. Large orange discs remain painted on huge river boulders. They and buoy-like signs marked the road's automotive "channel." Not infrequently aquatic motorists bounced to a sudden splashing halt as their car wheels dropped into one of the off-channel pot-holes. Then a tractor from the ranch obligingly pulled stranded cars out and set them on their watery way again.

If they know where to look, not far off the road, river travelers can find two related reminders of the violence that once marred the canyon's bucolic beauty. Under the twisted branches of a grove of scrub cedars, a piece of native stone marks a solitary grave. The crude, hand-cut inscription reads: "Father John Maloney, killed by Indians, 1867."

A few hundred yards away, just above a ledge in the canyon wall and now faded almost from sight, are vestiges of crude Indian paintings. One depicts

a tall man in a frock coat, with arms outstretched in a gesture of peace and friendship. This is a picture, painted by a group of renegade Comanches, of Father Maloney, the missionary they slew.

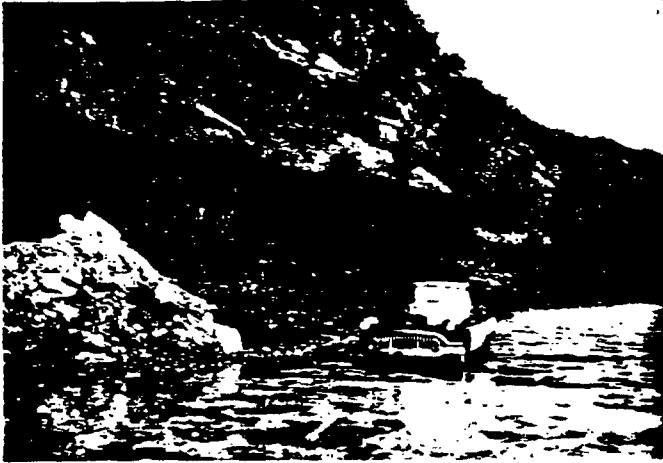
The unique road, and the breathtaking beauty that surrounds and overhangs it, are among the many attractions of Prade Ranch, within whose boundaries it runs. It was this beauty that inspired the state of Texas to secure an option to buy the property about 40 years ago, with the idea of converting it into a state park. Only the inaccessibility of the area at that time deterred the state from exercising the option.

Prade Ranch is located in the heart of the Angora goat country. In addition to cattle and horses, it has several thousand of these long-haired animals,

Still clearly visible in the limestone bed of the river are the narrow ruts cut there decades ago by the grinding wheels of pioneers' wagons.



A ROAD, A RIVER AND A RANCH



Although a modern highway parallels the old road, motorists have more fun and see more of the area's beauty by driving up the old watery route.



Abounding in deer and wild turkeys, Prade Ranch attracts hunters to its rugged acres in late fall and early winter . . . Below, besides cattle and horses, the ranch's livestock includes a large herd of Angora goats, prized for their coats.



so prized for the fine quality of their coats. But because of the scenic wonders and the fine fishing, hunting, horseback riding, swimming and quiet solitude, the main business at Prade Ranch now is guests. No "dude" ranch, Prade provides an informal retreat for sportsmen and vacationers.

The vacation season runs from May into October, with hunters coming to try their luck at the plentiful deer and elusive wild turkeys in November and December. Accommodations are in rock cabins, built of native limestone around a grassy quadrangle that is surrounded by mountains and overlooks the beginning of the canyon.

Because Prade Ranch boasts its own United States post office—one of four in Real county, but one of the smallest in the country—the ranch's location is indicated on road maps. State highway signs also point motorists to it.

But while the ranch retreat is easy to locate and readily accessible over smooth Texas roads, and while it is one of the oldest guest ranches in the state, it was raw wilderness three and a half decades ago. That was when Earl T. Prade, a Dallas businessman, stumbled on it while hunting one raw winter day and fell in love with the area's rugged beauty. Even through the chilling sleet, he recognized its grandeur, acquired the property and went into sheep ranching.

Guests Welcomed

The country was too attractive and the Prade family too hospitable not to share it with others. It wasn't many years before guests were welcomed.

The present owner is Earl T. Prade, Jr., who with his wife and mother, directs ranch operations, plays host to as many as 40 guests at a time, and handles the flow of mail through the pint-size post office.

The best way to drink in the scenic splendor of the area is to mount the western saddle on one of the ranch's sure-footed saddle horses and ride the trails that twist and turn over the hills and through the canyons of the far-reaching acres. From many vantage points, there are rewarding views—off in the distance, or downward hundreds of feet to the unique road with its old wagon ruts in the Frio River bed.

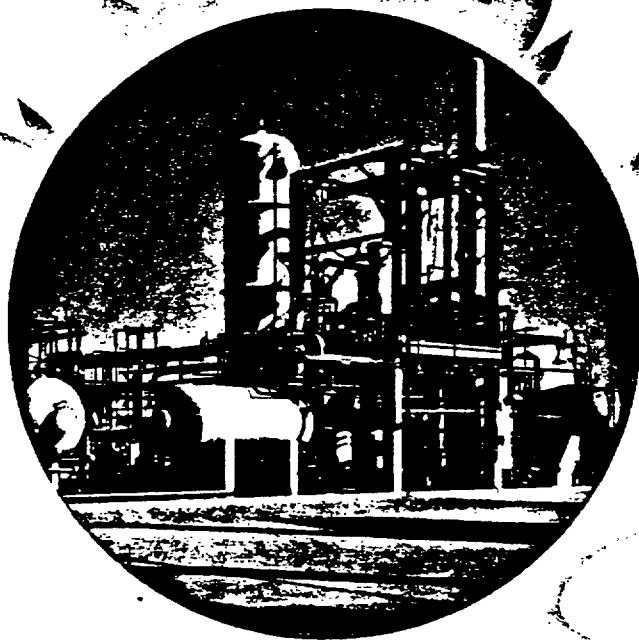
Even though the solitary car splashing along is a modern automobile, it doesn't take much imagination to transform it into a pioneer wagon, once again making its way through the Texas hills. #

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MADE IN CANADA—

Now more than ever

COMPLETION THIS FALL of an expansion of the Ethyl Corporation of Canada Limited manufacturing plant near Sarnia, Ontario, provides Canada with modern facilities for the production of two important chemicals required in the production of antiknock compounds. New units to make ethyl chloride and ethylene dichloride have been built at the plant.

With the new process units in production, the antiknock compounds, and the gasolines to which they are added by Canadian refiners, will, more than ever, be all-Canadian products.

First step in ending Canada's reliance on sources outside the country for antiknock compounds was taken four years ago when the Ethyl of Canada tetraethyl lead plant went on stream. Now, the sec-

ond step makes a further contribution to Canada's overall economy and self-sufficiency. In the past, it has been necessary to import ethyl chloride and certain other components of "Ethyl" fluid from the United States.

At the Ethyl of Canada plant, ethyl chloride will be manufactured from ethylene and anhydrous hydrogen chloride in the presence of an aluminum chloride catalyst. Ethylene dichloride will be manufactured from ethylene and chlorine. Supplies of ethylene, hydrogen chloride and chlorine will be purchased locally.

The new chemical processing units incorporate the latest design and engineering features resulting from Ethyl's long experience as the world's leading producer and marketer of antiknock compounds.

AIMING FOR MARKET EXPANSION



SPECIAL ADVERTISING that's aimed at the vast market of hunters is just one of the ways Ethyl Corporation advertises to increase the market for service station products. This is on top of Ethyl's Magic Circle advertising in LIFE, LOOK, SATURDAY EVENING POST—where regionalized ads appear in the four major geographic sections of the country, supplemented by SUNSET on the West Coast.

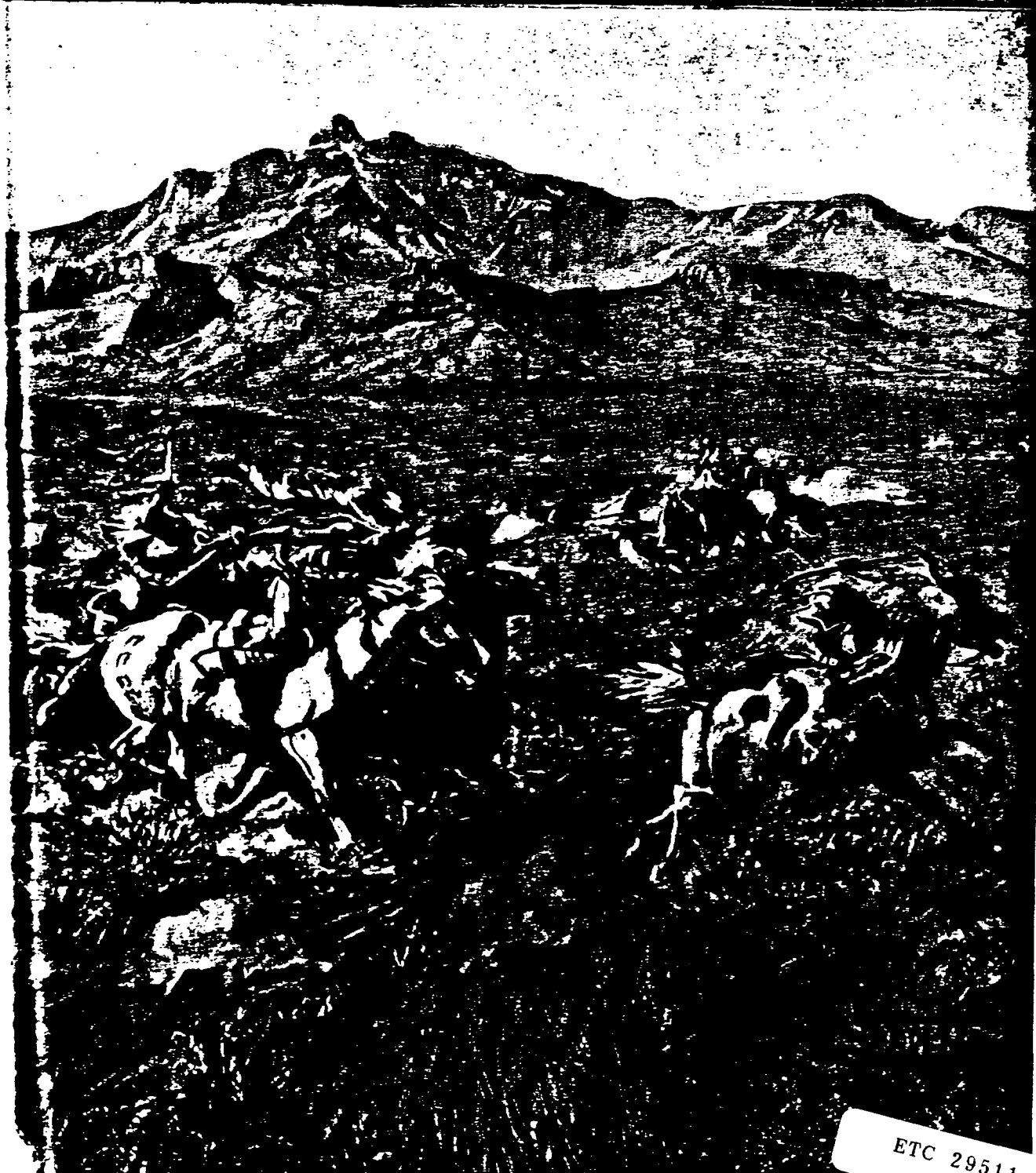
And there's also the local approach—Magic Circle ads in the Sunday supplements of newspapers in 27 major cities across the country, tailored to each locale. That's a lot of ammunition—all for greater expansion of the market!

ETHYL CORPORATION

NEW YORK 17, N. Y. • GULF • CHICAGO • LOS ANGELES
ETHYL CORP. OF CANADA LIMITED, TORONTO
ETHYL USA (EXPORT) NEW YORK 17, N. Y.



ETHYL NEWS



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ETHYL NEWS

NOVEMBER-DECEMBER 1960

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manufacturer of "Ethyl" antiknock compounds and other additives used by oil companies to improve the quality of petroleum products.

B. B. Turner, President
William R. Perdue, Jr., Vice President and Treasurer
Herbert A. Savage, Secretary

Richard F. Cook, Editor, ETHYL NEWS
Stanton P. Nickerson, Associate Editor
Carsten Grande, Art Director

Articles from outside sources are welcomed.

Upon request, permission to reprint material appearing in ETHYL NEWS will be granted.

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THE COVER painting, "The Stagecoach Attack" by Charles M. Russell, is one of many originals on display at Woolaroc museum in Bartlesville, Okla. See "A New Look at the Old West" pages 20-23.

Printed in U.S.A.

Antiknocksfo

IN THE FAST-MOVING TECHNOLOGY of modern oil refining, antiknock compounds are arousing new interest and are taking on added importance. Faced with competition, rising costs and the changing gasoline requirements of a growing automobile population, refiners are taking a new look at the use of these chemical additives.

Recent surveys indicate that, with only minor exceptions, refiners can achieve the octane increases that the industry has anticipated for the next five years through the use of antiknock compounds alone. This means that little or no capital will be required for expensive octane improvement facilities in the foreseeable future.

Other Advantages

In addition, antiknocks offer gasoline manufacturers other potential advantages. Exhaustive research studies and full-scale use in refineries and ultimately in billions of car-miles on the road have demonstrated that they: (1) are one of the most economical methods of octane improvement, whether costs are figured on Research, Motor or Road ratings; (2) give a road octane bonus; (3) decrease gasoline sensitivity; and (4) increase refinery flexibility.

To provide refiners with antiknock compounds for all possible needs, Ethyl Corporation, the pio-

Ethyl

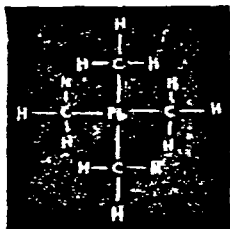
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for Every Need

Ethyl offers full line of octane improvement additives and technical assistance

neer marketer and the leading supplier, now offers a broad range of these products. As a part of its service, the Company shares the findings of its extensive research programs with the industry as a whole. At the same time, Ethyl representatives work closely with individual refiners, helping them select the best compounds for their particular situations and assisting them in determining the most desirable cost-effective concentrations.

TEL Widely Used

Of Ethyl's antiknock compounds, the original, tetraethyl lead, was introduced by Ethyl in 1923. Over the years, it has come to be used in more than 98 percent of all automotive gasoline.

More recently, with changing techniques in oil refining and changing requirements of automobile engines, Ethyl has added other antiknocks to its list of products for the petroleum industry. The new antiknocks include tetramethyl lead and three Mixed Lead Alkyls (MLA-250, MLA-500 and MLA-750).

In addition, special physical mixtures of TEL and TML blended to individual refiner's specifications, also are available. These mixtures provide especially good results in some gasoline stocks.

For the last year and a half, Motor 33 Mix, a manganese-lead antiknock highly effective in cer-

tain gasolines, also has been offered to refiners in commercial quantities.

Of the newly available antiknocks, tetramethyl lead is probably the best known. It is similar to tetraethyl lead and works in generally the same way. The principal differences are that TML is more volatile and has greater thermal stability.

The MLAs (Mixed Lead Alkyls) are made by processing to equilibrium composition specified proportions of TML and TEL. In the presence of a catalyst, the methyl and ethyl radicals redistribute. To make MLA-250, the proportions of TML and TEL are selected so that 25 mol percent of the radicals present are methyl radicals and 75 percent are ethyl radicals. In MLA-500, there is a 50-50 division, and in MLA-750, there is a 25 ethyl, 75 methyl ratio.

Each of the Mixed Lead Alkyls contains three compounds, intermediate both in weight and volatility between TEL and TML—triethyl methyl lead, diethyl dimethyl lead and trimethyl ethyl lead—plus some unreacted TEL and TML.

Physical Properties Vary

In addition to variations in chemical composition, there are variations in physical properties of the Mixed Lead Alkyls—in the amount of metallic lead present by weight, in volatility, and in anti-

ANTIKNOCKS FOR EVERY NEED

knock capabilities. Although the last factor is less well understood, it is related to thermal stability. TML has greater thermal stability than TEL. Therefore, TEL may tend to dissociate in an engine at a lower temperature than TML. This means that the active ingredient—the lead oxide—is made available to do its job at different times in the engine cycle, depending on which compound is present.

Physical mixtures of TEL and TML have greater volatility than their equivalent Mixed Lead Alkyls—and volatility is important in distribution in an engine during acceleration. It has long been recognized that TEL in engines with poor distribution tended to lag behind the lighter fuel components in the intake manifold during acceleration. If the light components are low in octane number, the fuel tends to knock at lower speeds. Thus, a more



The availability of several different antiknocks helps oil refiners satisfy the changing gasoline requirements of a growing automobile population.

volatile antiknock tends to provide additional antiknock quality to the low octane light materials in the gasoline, and knock caused by poor distribution is avoided.

Volatility is one reason why TML has aroused so much interest among European refiners who make gasoline by taking light, low octane straight run and blending it with high octane less volatile catalytic reformat. The majority of European cars have manual transmissions, which means that accelerations can be made at very low engine speeds where manifold lag and resulting knock are likely to occur. The use of TML helps eliminate this knock.

Because of the different qualities of antiknock compounds and the wide variations in refinery situations, an individual refiner's choice of the best additive is necessarily an important but complex subject. His decision, of course, is influenced by his objectives. Does he want an antiknock that has the greatest cost-effectiveness in his gasoline, or is he looking for the antiknock that gives him the highest octane quality?

The applications of antiknocks to compensate for fuel deficiencies is not easy. It depends on which grade—premium or regular—the deficiency is in, and how much the refiner can afford to spend to correct it. In general, to correct a low octane front end situation, the most volatile antiknock, TML, is best. Or perhaps mixtures will satisfy.

Variables to Consider

When it comes to cost-effectiveness, there are a number of variables that must be considered: octane level, fuel composition, antiknock concentration, rating method, sulfur concentration, other additives and concentrations, and finally the price of the antiknocks.

A convenient method for appraising the various antiknocks is to compare them with TEL. Generally, a refiner has laboratory antiknock specifications which he currently is meeting with certain concentrations of TEL. Since the cost per pound of lead or per gram of lead is different in each of the antiknocks, he can determine their cost-effectiveness by calculating the relative weight of lead required to give equal treating cost to that achieved with TEL.

Actually, cost-effectiveness is a highly selective feature, depending on a refiner's fuel composition

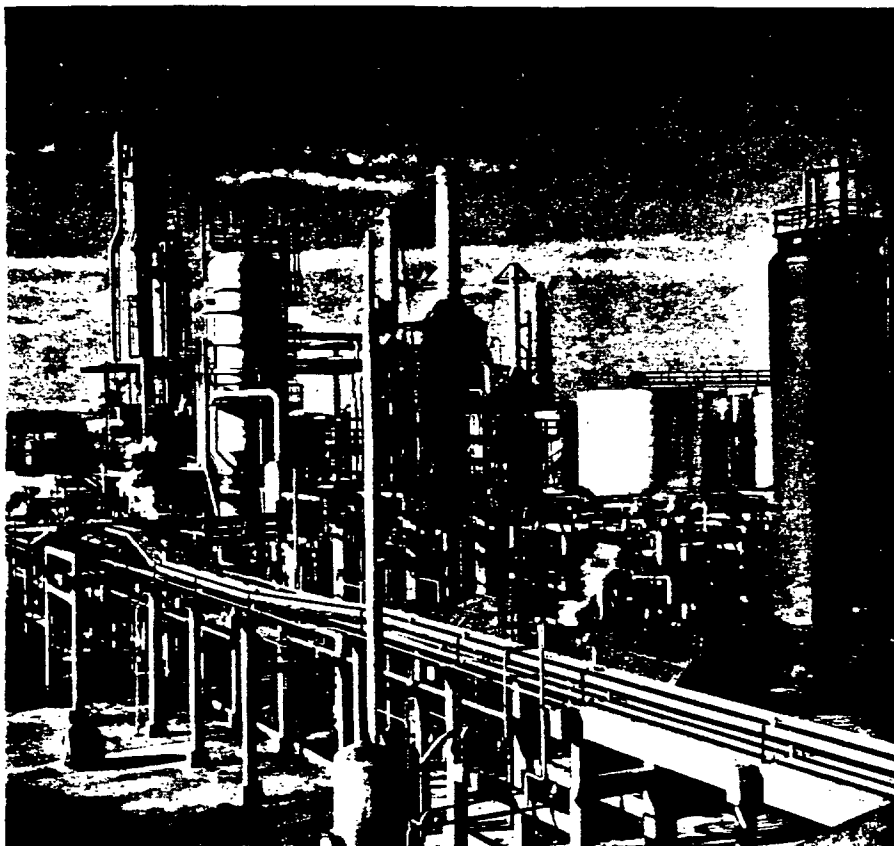
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The use of antiknock compounds increases refinery flexibility and eliminates or defers capital outlays for the construction of expensive octane improvement equipment.

and antiknock compound concentration. In this connection, Ethyl Corporation has recently completed a comprehensive laboratory and road rating program. A summary of the data developed is now available to refiners. Later this winter, a fuller report, giving an analysis of all the data obtained from the program, will be issued.

The preliminary data and the comprehensive analysis are expected to help refiners evaluate the savings that may be achieved through careful selection and use of an antiknock.

Generally speaking, TEL still is considered one of the best antiknock compound buys, based on its price and established versatile effectiveness.

In addition, higher concentrations of TEL provide a road bonus in many fuels. A road bonus is the greater road octane gain from increased TEL than the octane gain indicated by Research and Motor ratings in the laboratory.

The road bonus phenomenon is not a new discovery. It was only recently, however, that comprehensive efforts were made to look at all available information, determine the size of the bonus,

find out what it is worth, and determine how best to take advantage of it.

In recent Ethyl test programs, it was found that *on an average* increases in TEL gave from 20 to 50 percent better results on the road than had been measured by the Research method in the laboratory. It also gave more on the road than was indicated by the Motor method. Since these were averages, some fuels naturally had much greater road gains than others.

Ethyl's Research Laboratories have prepared a general report on road bonus—how it is measured, its magnitude and other pertinent factors.

The bonus provided by lead antiknocks is important and timely—especially in the light of the refining industry's current interest in and emphasis on road performance. So, too, the careful evaluation and wider use of antiknock compounds in general are increasingly important as refiners individually and collectively continue their efforts to provide economically the quality gasolines needed to satisfy the changing requirements of a growing automobile population. #

Toronto — Ci

Pacesetter for the dynamic growth and rapid industrial

By Thom Yates

ALMOST ALL OF THE WORLD'S CITIES like to describe themselves as "dynamic," "progressive," "fast-growing," "hospitable" and "friendly." In Toronto's case, these adjectives fit precisely.

The booming metropolis on the northern shore of Lake Ontario is, far and away, Canada's "first," "largest" and "most" in all but one or two major categories. The metropolitan Montreal area, for instance, is still the country's most populous city, but only by a margin of a quarter-million over Toronto.

The "new" Toronto was born at the close of World War II, but the end of its physical, economic, industrial and cultural growth is nowhere in sight. Its metropolitan area now houses approximately 1.5 million people, almost 10 percent of the nation's population. This number will swell to 2.8 million in the next 20 years. Greater Toronto provides almost 11 percent of Canada's jobs and one-third of the nation's total purchasing power is concentrated there.

Now a World Port

If bustling Toronto, in its surge, needed any outside assistance, it got it last year with the opening of the St. Lawrence Seaway. Overnight, the Seaway transformed Toronto from a busy harbor city (on Lake Ontario) into a great world port.

Perhaps the facelifting of a single street is not enough to reflect a big city's total progress. But the

changes that have been made on Toronto's University Avenue are typical of those constantly taking place in this, Ontario's capital city. University Avenue has become Toronto's showplace—a formidable rival to New York's Park Avenue, Los Angeles' Wilshire Boulevard and Paris' Champs Elysées.

Street of New Buildings

Along University Avenue, one of the widest main streets in the world, have risen in recent years many new buildings, including several that house head offices or divisional headquarters of petroleum companies. At the head of the street are the Ontario parliament buildings. On University Avenue too are located several hospitals, including the famous Hospital for Sick Children. This is appropriate for, along with its many other superlatives, Toronto is one of the world's leading medical centers.

It is hard to find any field in which Toronto is not among the pacesetters. You name it—banking, industry, education, printing and publishing, anything at all—and Toronto almost certainly leads the parade, at least so far as Canada is concerned. The city boasts such other features as the country's only subway (running under Yonge Street, the city's main shopping thoroughfare) and a real, honest-to-goodness castle, located, incidentally, not far from the Ethyl Corporation of Canada Limited executive offices on St. Clair Avenue West. The massive 98-room structure, complete with 15 telephone-equipped bathrooms and 23 fireplaces, is one of the

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City of Superlatives



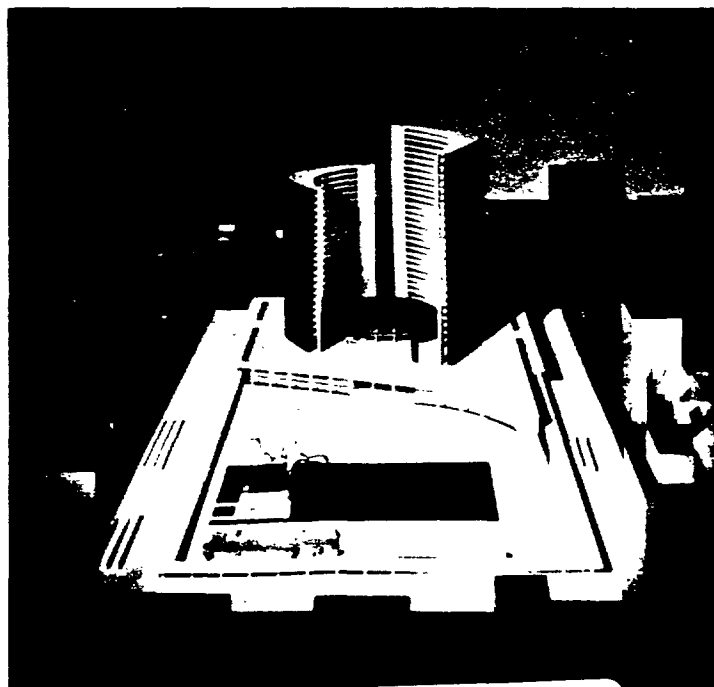
The opening of the St. Lawrence Seaway gave fast-growing Toronto still another boost, transforming it from a busy Lake Ontario harbor city to a bustling world port.

Below, the modernity of this model of Toronto's soon-to-be-built city hall reflects the spirit of growth and progress that permeates the metropolitan area.

bustling city's greatest tourist attractions.

So also is the Canadian National Exhibition, billed extensively and not incorrectly, as the greatest annual event of its kind on the face of the earth. The three million people who visit this late August-early September extravaganza each year vouch for that.

If Torontonians themselves find anything to deplore about their flourishing city—apart from such universal minor aggravations as the lack of parking spaces—it is that the city is too Americanized. There is no denying that "Yankee" influence is strong. If it weren't for Canadian currency and a few distinctively Canadian products, particularly beer and cigarettes, a visitor might think he was in



TORONTO—CITY OF SUPERLATIVES

New York, Denver or Houston.

In deploring that his city is more American than Canadian, the Toronto citizen is not being bitter or supercritical. He is merely recognizing a situation that exists and that probably could not have been otherwise. Toronto's geographic proximity to the United States and its close business, cultural and other ties with its neighbors to the south are, of course, responsible.

Always a favorite port of call for tourists from the United States, Toronto is also well known to two other groups of Americans—businessmen and municipal planners.

Businessmen are particularly interested because Toronto has the world's largest concentration and widest diversification of branch operations of non-Canadian companies. The inpouring of business personnel from other lands (more than 75 percent of the 175,000 people who settled in Toronto in a recent five-year period came from outside Canada) has enhanced the city's social and cultural life—and veteran Toronto residents readily admit it.

Toronto thinks that the industrial complex located within what a word-coiner has dubbed the

"Torontario" area might be the most complete and diversified in the world. At any rate, it is claimed, there lies within Toronto and a 100-mile radius all of the manufacturing, professional and retailing elements of Boston, Chicago, Detroit, Hartford, New York and Pittsburgh, though perhaps on a smaller scale. As a result, it is no secret that U. S. business firms often use their operations in and around Toronto as a combination training school-proving ground for management personnel. Says one U. S. executive: "Anything that may occur in the United States has already been met in the Canadian operation, and probably on a tougher basis."

As for the municipal planner, his eye is on the new Toronto government that became effective six years ago. This is the Municipality of Metropolitan Toronto, a federation of 13 separate communities in the area. With formation of the "Metro," Toronto and its suburban towns were the first in the Western Hemisphere to give what has been termed "official political recognition to the fact that modern industrial society has created a new form of human settlement—the metropolitan area."

The metropolitan government is simple in its con-

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Canada's only subway provides rapid transportation through the heart of Toronto, under Yonge Street, the city's principal shopping thoroughfare.



Quotations from the busy Toronto Stock Exchange are in demand in Switzerland, Germany, France and Britain, as well as throughout Canada and the United States.

cept. All municipalities retain their local autonomy and local responsibilities, while yielding responsibility for major metropolitan services. Thus the "Metro," acting on behalf of the communities involved, is charged with providing scores of services—such as police, arterial road and expressway construction, licensing, housing and even the burial of indigent persons.

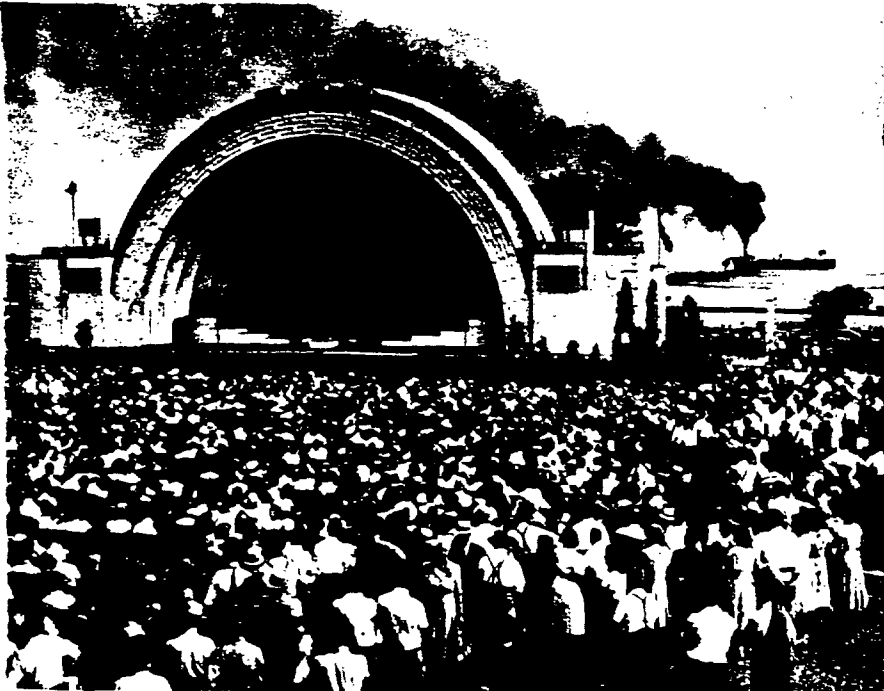
May Be Tried Elsewhere

These and others are services which many of the communities individually could not afford or otherwise provide and which might be duplicated or overlapped from one neighboring town to the next. If the metropolitan government of Toronto succeeds—and it has so far—it or variations of it may well be tried in metropolitan areas in the United States and other countries.

Thus, going back to the original thesis, "dynamic," "progressive," "fast-growing" and other similar adjectives do fit Toronto, and fit it well. Nothing perhaps epitomizes Canada's unparalleled advancement as much as the ever-changing face of Toronto.≠



Modern, attractive stores, amply stocked with a wide selection of the world's goods, make Toronto a popular and complete shopping center.



The Canadian National Exhibition, an annual event, attracts several million visitors from around the world to its spacious grounds and permanent buildings at Toronto each summer. Besides displaying the products of forest, farm and factory, it includes music festivals, athletic competitions, theatrical performances and art collections.

MADE IN OR

South Carolina plant manufactures a number of Ethyl's newer chemicals

A COMPACT and highly efficient plant on the coastal plain of South Carolina, at the county seat of Orangeburg, is becoming an increasingly important development and manufacturing center for chemicals sold by Ethyl Corporation.

Products from Orangeburg include versatile petroleum additives, as well as compounds used in the petrochemical, rubber, plastics and other industries. Some of these chemicals have potentials in the manufacture of dyes, pharmaceuticals, cosmetics and in food processing. Further likely uses range from synthetic resins to fuels for rockets and guided missiles.

As the world's largest producer and marketer of antiknock compounds for gasolines, Ethyl provides United States and foreign refiners with these additives from plants at Baton Rouge, La., Houston, Texas, and Pittsburg, Cal. The plant of Ethyl Corporation of Canada Limited at Sarnia, Ont., remains the chief source of antiknock compounds for the Canadian oil industry.

Mostly Petroleum Additives

At the same time, Orangeburg is a focal point for manufacturing new chemicals and for development programs on experimental products. So far, most of the compounds made there are for addition to petroleum products—gasolines, lubricants and jet and diesel fuels.

One of the additives for gasoline is the Company's manganese compound, which increases the effectiveness of leaded antiknock fluids. Shipments of manganese go to Baton Rouge, where the product is blended with TEL. The finished "Ethyl" Motor 33 Mix is then delivered to customer refiners.

"Ethyl" Multi-Purpose Additive for gasoline, introduced almost three years ago, is another major Orangeburg product. It has three uses: eliminating deposits in carburetors, preventing carburetor icing, and protecting metal surfaces against corrosion.

Reduces Engine Stalling

The compound is highly effective in reducing engine stalling and in keeping fuel systems clean. Its anti-corrosive properties also help check the deterioration of gasoline storage and distribution systems. Because small concentrations of Multi-Purpose Additive provide desirable results, it is more economical than other agents with similar purposes.

An ortho-alkylation process discovered and developed in Ethyl's research laboratories is the basis for a group of inexpensive but aggressive antioxidants manufactured at the South Carolina plant. By controlling undesirable oxygen reactions, the agents help petroleum and related synthetic products preserve desirable characteristics.

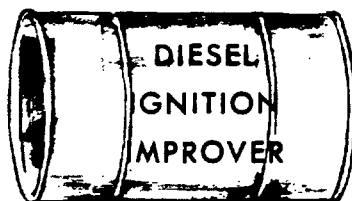
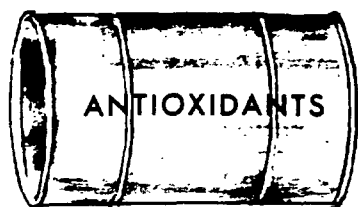
Several "Ethyl" antioxidants are now being produced commercially at Orangeburg. More than half of the present output is consumed in petroleum products. It is used for such purposes as checking gum formation during the storage of gasolines and jet fuels, and preserving the stability of lubricants and industrial oils. The unique properties of certain of these additives help reduce engine wear and promote the cleanliness of moving parts.

More recently, a line of several additional antioxidants has been developed by the Company for eventual production at Orangeburg in commercial

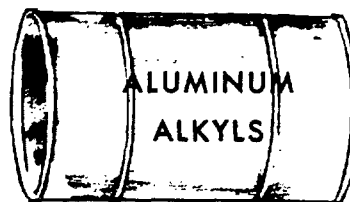
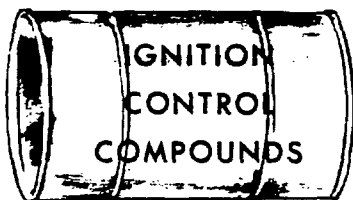


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ORANGEBURG



quantities. They offer promise as deterioration inhibitors in natural and synthetic rubbers, and in such plastics as polyethylene and polypropylene. They also have application in petroleum oils and waxes.

Among the first petroleum additives made at the South Carolina plant were Ethyl's first three ignition control compounds. These organic phosphorus chemicals combat surface ignition and rumble and reduce spark plug fouling in gasoline engines.

Also among the first Orangeburg products was "Ethyl" Diesel Ignition Improver. This amyl nitrate additive increases the cetane number of diesel fuels for automotive, railroad and marine use.

First Major Source

Aluminum alkyls and their halides have been produced at Orangeburg more recently. The plant's capacity is in the multi-million-pound-per-year range. It is the nation's first major source for a complete line of alkyl aluminum compounds.

The aluminum products are used as catalysts in the manufacture of plastics and synthetic rubber. They are being investigated for other applications, including chemical intermediates and as self-igniting fuels with scientific and military potentials.

Shipments are offered from half-pound samples up to tank-car commercial quantities.

Other new "Ethyl" products made at the plant are the Company's recently-introduced Extreme Pressure Additive 1, for cutting fluids, gear oils and transaxle fluids; and its Metal Deactivator, for gasoline, jet fuel and distillate fuels.

The wide range of chemicals produced at Orangeburg calls for many raw materials as well as unique processes. Requirements include sodium and ethyl chloride, obtained from the Company's Baton Rouge plant; ethylene, benzene, phosphorus oxychloride, phenol, amyl alcohol, methyl cyclopentadiene, isobutylene, aniline, manganese chloride, methyl chloride and aluminum.

The Orangeburg plant maintains close working relationships with Ethyl's Research and Development department—particularly the divisions located in Baton Rouge and Detroit, where projects for the plant's operations are generated. #



New York City's Wall Street was the scene of the first presidential oath-taking in 1789.



Lincoln's second inaugural is remembered for his "with malice toward none" speech.

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"I do solemnly swear..."

Presidential inaugurations are both impressively serious and exuberantly gay

By Henry F. Unger

"THE GORGEOUS RECEPTIONS given Alexander the Great, Hannibal, Caesar and Napoleon . . . sink into insignificance by comparison with the grand review about to be enacted in the capital of the greatest nation on earth."

This advance description, by the late Representative Usher L. Burdick, of North Dakota, referred to President Eisenhower's first inauguration back in 1953. It probably is almost as applicable to the coming inauguration of John F. Kennedy as 35th president of the United States on January 20.

All that the Constitution requires in the way of ceremony is the taking of an oath by the new president. But ever since Andrew Jackson's time, the event has been surrounded by pomp and festivity—especially when the "outs" are restored to power.

In 1953, the Republicans, celebrating the end of a 20-year drought in national administration, opened the inauguration valve wide. They staged a mammoth parade with 25,000 participants; sold

175,000 official programs and 10,000 inaugural medals. Over a half-million people stretched and strained to watch the 3½-hour parade in person and an estimated 75 million more saw it on television.

In 1957, at President Eisenhower's second inauguration, festivities included four simultaneous inaugural balls that attracted 14,600 people. The bill for the day's events topped \$1 million.

Drama-packed Moment

Beneath all the glitter and frivolity of presidential inaugurations is the central, drama-packed moment when the newly-elected president faces the chief justice and repeats the oath as set forth in the Constitution: "I do solemnly swear (or affirm) 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."

Then before a hushed crowd of over 50,000 people in Capitol Plaza and millions more in the tele-

vision and radio audience, the new president delivers his inaugural address.

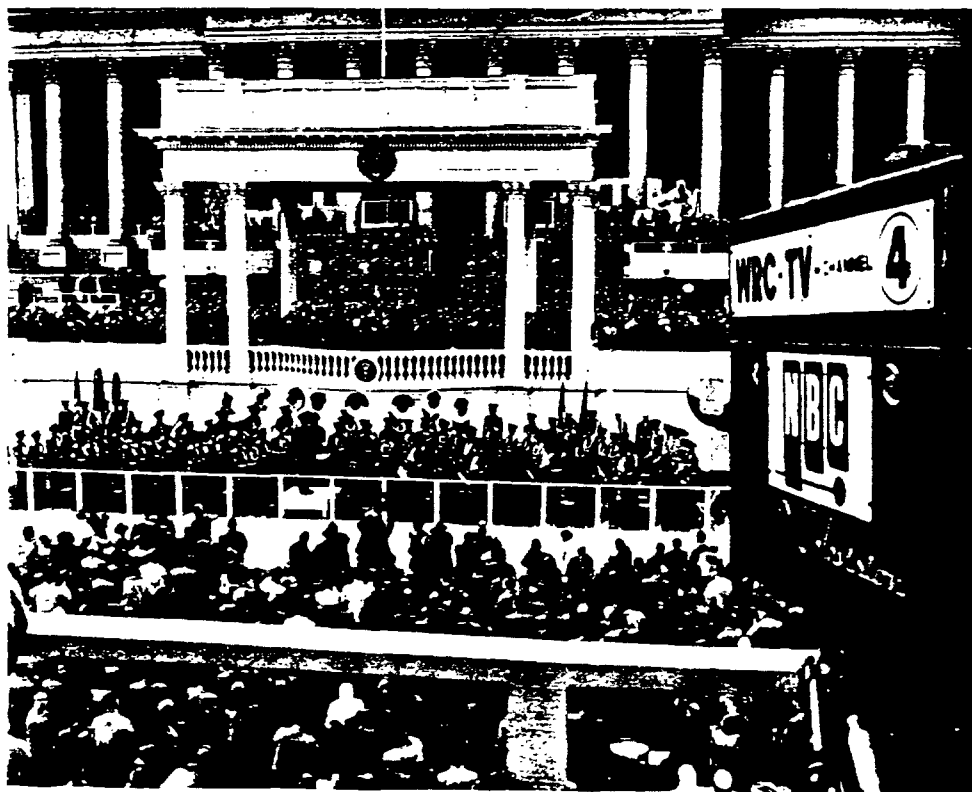
"When you stand up in front of America and take your oath . . . you can't feel anything but solemn," President Eisenhower told reporters just before his second inauguration. Evidence of Ike's solemnity was obvious at his first inauguration when he personally prayed for Divine guidance at the ceremony.

Presidential inaugurations were launched, of course, with George Washington's oath taking on Wall Street in New York City, then the capital, in 1789. Congress had set Wednesday, March 4, as the time for the president's term to begin, but Washington's inaugural was delayed until April 30,

after the Father of His Country had made a hard trip by horseback, coach and barge from Mount Vernon.

Washington's hand rested on the last chapter of the book of Genesis in the Bible. Chancellor Robert R. Livingston administered the oath. When he had finished, he turned to the crowd and shouted "Long live George Washington, president of the United States."

Twelve years later, the inauguration still wasn't surrounded with much festivity. President-elect Jefferson rode alone from his home at Monticello, outside Charlottesville, Va., and put up at a Washington boarding house. He walked from there to the Capitol to take the oath.



"I DO SOLEMNLY SWEAR . . ."

The induction of Andrew Jackson and his running mate, Martin Van Buren, in 1829, turned inaugurations into a big league event. Such bitterness resulted from the campaign that retiring President John Quincy Adams slipped out of town the day before to avoid facing Jackson. The new president and vice president were undaunted by the snub and rode in a hansom carriage drawn by beautiful horses and escorted by a troop of cavalry. Thousands of Jackson's backwoods followers took over Washington and proceeded to make merry in the White House and in the streets.

Since that time, and even before, planning committees and presidents-elect have seemed to take great delight in producing "firsts" at inaugurations.

President James Monroe was the first to move the ceremony outdoors. At his inaugural, the Marine band played for the first time and has been

playing ever since. James Madison came up with an earlier "first" when he had his attractive wife stand at his side when he took the oath of office.

Rutherford B. Hayes was the first president to take the oath in the White House and John Quincy Adams was the first to wear long trousers—not knee breeches—for the occasion.

Among other notable firsts, were initial radio and television broadcasts of oath-taking and inauguration speeches. The former distinction went to Calvin Coolidge in 1925, while Harry S. Truman, inaugurated in 1949 at the height of the post-war TV boom, can claim the latter. Warren Harding broke the horse barrier in 1921 and became the first to ride in an automobile to the Capitol steps ceremony.

Despite his age—at 68 the oldest man to take the oath of office—William Henry Harrison was the first to dance at his own inaugural ball. Harrison caught cold in a driving rain on the eventful day and died a month later, but he also is remem-



12 Taking office in 1933, FDR told America "The only thing we have to fear is fear itself."



By 1957 festivities had grown so large that the traditional inaugural ball was held in four sections in different parts of Washington. President Dwight D. Eisenhower visited all four in celebrating the beginning of his second term.

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bered for the longest inaugural address on record—an 8,000-word opus.

In sharp contrast to Harrison's long-winded delivery, an ailing and war-weary Franklin D. Roosevelt used only 559 words at his fourth inauguration in 1945—the second shortest such speech on record. All-time champion for brevity is George Washington who uttered only 133 words in his second inaugural address.

Off-repeated Phrases

Long or short, inauguration speeches have been the setting for what were to become oft-repeated phrases. In 1801, Thomas Jefferson warned of "entangling alliances." In 1865—just a month before his assassination—Abraham Lincoln established the course he intended to pursue in his second administration: "With malice toward none, with charity for all, with firmness in the right as God gives us to see the right, let us strive to finish the work . . ."

Woodrow Wilson called his induction into office "not a day of triumph, but a day of dedication." And in 1933, Franklin D. Roosevelt assured a depression-wracked people that "The only thing we have to fear is fear itself."

Twice, when inauguration day has fallen on Sunday, incoming presidents—Rutherford B. Hayes and Dwight D. Eisenhower—have taken the oath privately on Saturday and publicly the following Monday. Thus, technically speaking, the country has had two presidents in office at once.

Weather has often dampened inauguration day gaiety. Statistics show that seven out of 10 March 4 inaugurals were spoiled by rain or snow. The 20th amendment to the Constitution switched the date from March 4 to January 20. Franklin D. Roosevelt became the first president to take office—his second term beginning in 1937—on the earlier date. Records indicate that inauguration weather has been much more favorable since the change.

A platform erected over the steps of the newly rebuilt East Front of the Capitol will be the scene of the 1961 oath-taking ceremony and inauguration speech. Later, the new president will watch the parade from a \$40,000 modernistic reviewing stand—a slanting roof supported by 16 slim posts.

Last fall, 23 architects submitted designs for the stand in a contest sponsored by a joint Republican-Democratic inaugural committee. The winner, Robert Paul Bracket of Washington, received \$100 prize money, \$150 in fees and the autograph of the new president, but he has one concern. The roof of the structure is designed with 26 square holes around the edge to break up the flat area. Mr. Bracket hopes it won't rain on inauguration day. If it does, he hopes it won't rain through on the celebrities.

But rain or shine, inauguration day 1961 will no doubt take its place in history as both a solemn and festive occasion. It may even contribute another "first" to inauguration lore. #



Colorful parades with thousands of participants, including detachments from the country's service academies and fly-overs by military aircraft, add to the pomp and pageantry of the quadrennial January 20 event.



Better cars than ever

Automobile manufacturers are putting new emphasis on quality and durability

By Stanton P. Nickerson

BEHIND THE FANFARE of promoting the new 1961 automobiles is one of the most concerted efforts ever made by Detroit to give buyers the best cars they have ever owned. The automobile industry is concentrating more intensively than ever on insuring the highest possible quality in every vehicle that comes off assembly lines.

Improvement, of course, has characterized the evolution of the automobile since horseless carriage days. With a record of such achievements as successively better engines, greater riding comfort, increasing safety and smarter styling down through the years, the automobile industry has become synonymous with the ultimate in modern industrial progress. More recent emphasis on quality advancement is giving new dimensions to these and other accomplishments.

New Car Warranties

The confidence of automobile manufacturers in their ability to meet even more exacting public expectations is one reason for the standard warranty now in effect on most new cars—the most liberal ever offered. It guarantees replacement of defective parts during the first year, or first 12,000 miles, whichever comes first. Some models are even being sold with a warranty for two years or the first 24,000 miles.

Such guarantees are feasible largely because of highly successful quality control programs. Some manufacturers also consider designing, engineering,

performance testing and related technical aspects of car improvement as intrinsic parts of the quality package. General Motors, for example is among those that use this broader concept, often called "reliability control," because it covers everything done to make cars more dependable.

Since the average car contains some 10,000 parts, experience has emphasized the importance of quality checks at early stages in manufacturing. Preventing trouble under a "stitch in time saves nine" procedure pays off.



Modern scientific methods and instruments are used to check the quality of component parts.

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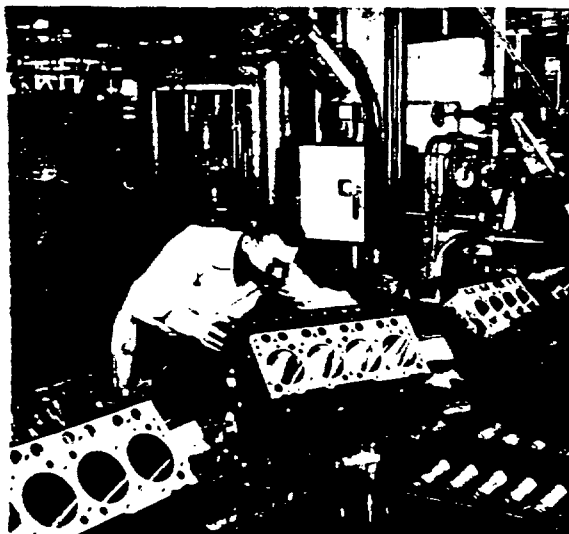
Advances in research, engineering, manufacturing and quality control all contribute to new car production.

Ford, for example, begins with rigid specifications for the steel and iron it uses, much of which is produced in the company's own mills. Careful attention to these basic materials eliminates problems which could arise later in fabricating bodies, frames and other metal parts. All automobile companies demand equally high quality in the iron and steel they buy.

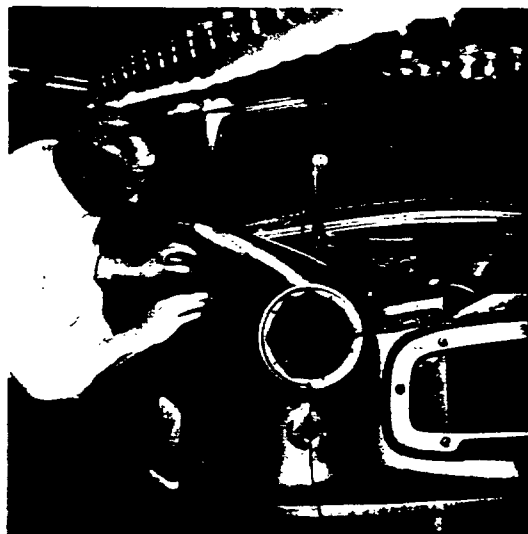
Attention to mechanical components from a reliability-quality standpoint is particularly important, with early spotting of possible failures essential.

Costs can snowball and owner satisfaction decline sharply unless seemingly minor defects are caught in time.

Here is a typical situation: if an engine part costing less than a dime is installed improperly, the mistake can be corrected at the engine plant for \$2. In case the trouble is not found until after the engine has been installed in an automobile, the cost of eliminating it can rise to \$18. But if the car is delivered to a customer and causes a breakdown, the bill for repairs and replacements may reach \$100.



Finely machined engine blocks are examined meticulously by experienced craftsmen.



Careful scrutiny on the assembly line eliminates flaws in car body fabrication and finish.

BETTER CARS THAN EVER

Quality-reliability programs are designed to prevent such accumulations. One of the reasons they are successful is the ingenious devices and continually improving techniques used.

In metal parts, for instance, internal as well as external flaws can be spotted by spectroscopy, radiography and isotope examinations. Instrumented sonic and ultrasonic waves verify the correct fabrication of engine blocks and cylinder dimensions.

Three thousand piston pins can be inspected hourly by an automatic machine which rejects faulty ones. Similar devices check valves, bearings, cam shafts, gears and other parts which must conform exactly to engineering specifications.

Cooperative Efforts

Every step or mechanism important in safety, as well as such sensitive parts as carburetors, instruments and components of electrical systems are subjected to rigid quality evaluations.

The coordinated efforts of automobile companies and suppliers lead to quality and reliability improvements, too. Rambler's ceramic-coated muffler and tailpipe, for example, warranted to last the lifetime of the car in the hands of the original owner, is a joint development of American Motors and the Walker Manufacturing Company. It is designed to eliminate costly replacements.

All automobile companies put finished engines through performance tests, in order to make sure that such essentials as balance, distributor timing, oil pressure, valves and the fuel system are in satisfactory adjustment. When they come off final assembly lines, completed cars undergo quality inspections that extend to minute details. Among the post-completion checks is exposure to high-pressure sprays of water, to test for body leaks.

Representative numbers of new automobiles are road tested daily after assembly-line clearance. And at many plants, top executives frequently choose a new car at random and give it a microscopic inspection which includes a test drive.

Exacting proving ground runs, of course, are closely related to quality and reliability evaluations. Putting new automobiles through their paces on proving grounds answers questions about safety, pickup, riding qualities, gasoline and oil consumption, hill-climbing ability and stopping distances,

and other aspects of performance, economy and durability.

Although automobile companies have different ways of organizing, staffing and operating their quality-reliability programs, the men in charge are key executives in all cases.

There is general industry agreement that quality and reliability are directly related to the caliber of employees and their efforts and abilities. With this in mind, some companies correlate job training and assignments with their quality programs to make sure that the best skills will be applied where they are most needed.

Studebaker-Packard workers sign a pledge that their craftsmanship will be the best of which they are capable. At another plant turning out luxury automobiles, assembly line inspectors are men with at least 25 years' experience with the company.

The "human element," even in an industry so geared to mechanization, plays a constructive part in quality-reliability programs. Chrysler finds that when divisions and plants vie with each other in achieving higher quality standards, the competition pays off in improvements of all kinds.

As it continues to increase quality standards, one of the automobile industry's most difficult jobs is convincing car-owners of what tremendous strides



Among the quality control tests of automobile parts are ones that check for corrosion resistance.



Key executives from all departments of automobile companies work closely to assure cars of top quality.

have been made in building more reliability into modern cars. Unfamiliar with the facts, some people still mouth the familiar cliché, "They don't build them like they used to." This hackneyed phrase is true, but with just the opposite meaning than the uninformed intend.

The most convincing evidence of this is found in statistics of how long cars now last compared to their former durability. In 1925, a typical automobile had road usefulness for only 6.5 years and

was ready for the scrap-heap after being driven about 25,000 miles. A modern car has an average life-span of 10 to 12 years and is good for some 125,000 miles. In other words, today's automobile is almost twice as durable as its predecessor of the mid-1920's. It will provide five times as much transportation.

Stepped-up quality and reliability control programs are one of the big reasons why the automobile industry has been able to make such progress. #



Exacting proving ground runs provide answers about many phases of car performance and durability.



Meet Ethyl's Jack Laubach

Like other account representatives, he's an "all-around" man with lots of experience

YOU NAME IT. Jack Laubach has done it.

Jack is an account representative in Houston, Texas. In his 14 years with Ethyl, he's had the full range of Ethyl service experience—from marketing activities to product service work in mixing plants and refineries.

Jack started with a bachelor of science degree in engineering. After a stint as a Naval officer, he trained at Ethyl's Research Laboratories in Detroit for a year, became a field representative, later an automotive service engineer. He's been an account

representative for the last eight years. "There wasn't much I missed in the way of variety," he says.

Experience like this makes him valuable as a link between his customers and Ethyl. As a captain of a big Ethyl team of specialists, it's Jack Laubach's responsibility to know his customers' needs so well that he can tailor Ethyl's many services to match those needs.

Other Ethyl representatives are all-around men, too, providing the same thorough approach to their customers' business.

Building specialties. tive, he sets ists' satisfac was part of



Jack prese carbon typ- road perfor that the lat gets to the



Laubach o ing out the expanding out the eff ling surface



Building dealer training programs is one of Jack's specialties. Here, with Don Connell, Ethyl field representative, he sets up props to show dealers how to improve motorists' satisfaction by matching gasoline to engine needs. This was part of a customer's comprehensive training program.



Jack presents a new report on the importance of hydrocarbon type in association with antiknocks to assure good road performance. An important part of his job is to see that the latest technical data developed by Ethyl Research gets to the people who can use them most effectively.



Laubach often finds demonstration very helpful in pointing out the specific advantages of the additives in Ethyl's expanding line. Here, with the aid of a desk unit, he points out the effectiveness of phosphorus compounds in controlling surface ignition and spark plug fouling.



Whenever Ethyl specialists can be of service to a customer, Laubach acts as liaison. Here he arranges with Tucker Dawson, manager of Ethyl's gasoline testing laboratory in Houston, for tests to give an oil company cross-check information on their own studies of TML effectiveness.



Laubach keeps up-to-date on improved handling methods and equipment through periodic refresher courses at Ethyl's experimental mixing plant near Houston. Many streamlined techniques, now saving refiners time and money in handling antiknock compounds, have been developed at this plant.

A New Look at the

Woolaroc Museum, founded by oilman Frank Phillips, tells a fascinating story of America



AN OKLAHOMA OILMAN'S INTEREST in the "boys and girls of today, the fathers and mothers of tomorrow" is responsible for one of the country's most uniquely entertaining and educational museums. Woolaroc museum, 14 miles southwest of Bartlesville, Okla., founded by Frank Phillips and operated by the Frank Phillips Foundation, Inc., is designed to help youngsters "profit by a knowledge of man's past and be enabled to plan and live a happier future."

Named for the woods, lakes and rocks that surround it, Woolaroc contains some 55,000 exhibits. They include valued paintings, rugged sculpture, and fascinating weapons, artifacts, handicraft and models. Together, the exhibits tell a colorful and lively story of America, with emphasis on the history of the Southwest, its Indian cultures and pioneer days. The arrangement of the exhibits presents a panoramic view of the past—from earliest known man down to the present.

Thousands of Visitors

Evidence of Woolaroc's appeal to the youngsters to whom it is dedicated—and grownups too—is seen in thousands of visitors that come each year. The majority are from out of state. Many come in school, Boy and Girl Scout and other youth organization groups. Cars from every state in the Union have been recorded in the museum's spacious parking lot. Busloads of eager young visitors have come from Oklahoma, Texas, Missouri, Kansas, Arkansas.

Thousands of visitors annually enter the vibrant, enjoyable museum through a strikingly beautiful doorway adorned with brilliant glass mosaic Indian figures.

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In Woolaroc
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Old West

America's colorful past



Louisiana, West Virginia, North Carolina, Georgia, Illinois, Tennessee and Ohio.

Patrick Patterson, director of the museum since 1938, has visited museums all over the country to get ideas for Woolaroc and has used his own ingenuity to develop it. Exhibition rooms are large, air-conditioned and well lighted. Exhibits are easy to see, clearly and interestingly labeled. Some are even out where they can be handled and examined closely.

There is no mustiness, no hushed formality, no lists of prohibitions. Picture taking is encouraged and even smoking is allowed. The result is a museum that is modern and informal—one that is used and enjoyed.

The 300-foot native sandstone building that houses the Woolaroc collections is set back among the blackjack oaks in the Osage hills. It is on the 4,000-acre Phillips ranch, just off state highway 123, between Bartlesville and Barnsdall.

As soon as visitors approach the ranch gate, they realize that Woolaroc is going to be something special. Signs advise against getting out of cars while driving the two-mile paved road to the museum parking lot. Herds of native and imported wild animals and flocks of birds—buffalo, elk, deer, Scottish highland and Brahma cattle, and peacocks—roam the well-kept grounds.

The entrance to the museum building provides a foretaste of what's inside. Around the gleaming



In Woolaroc's outstanding collection of canvases by widely acclaimed painters of Indian and frontier sub-



jects are "Custer's Last Stand" by Frederick Remington and "The Buffalo Hunt" by Charles M. Russell.

A NEW LOOK AT THE OLD WEST

metal doors, colorful glass mosaic establishes an Indian theme. Five large figures in ceremonial dress depict the five cultural areas of the United States, with the one over the doors portraying the Indians of the Great Plains.

First of Woolaroc's exhibition rooms is devoted to pre-historic Indians. The implements of the stone age, crude tools of the early agriculturist, exotic art forms of the mound builders, and the possessions of the basket makers are on display. They show how Indians lived before the coming of the white man.

The second room shows the Indians of the pueblos and their neighbors, the Navajos and Apaches—the weavers, potters and early American architects. These are the Indians who felt the first white man influence—that of the Spaniards in the 1540's.

The Spaniards brought the horse to America, and the museum's third spacious room shows the startling changes this animal made in the Indian's life. Horse-mounted Indians of the plains are the ones that Pioneers, depicted in the next room, found in great numbers west of the Mississippi.

Woolaroc's outstanding collection of original paintings includes some of the best in the field of western art. Canvases large and small depict In-

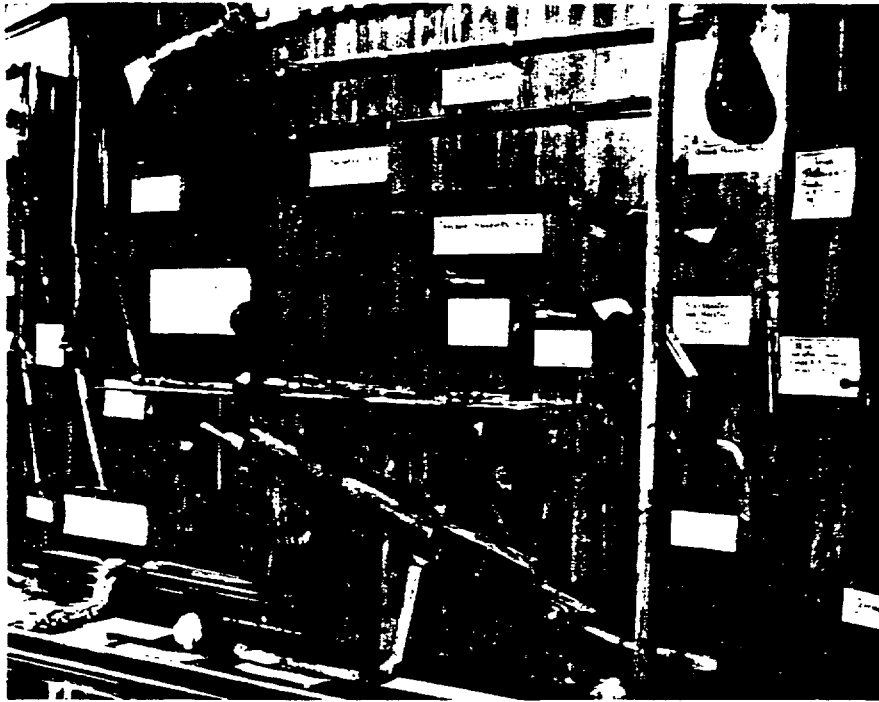


This winning model for the Pioneer Woman statue, and the 11 others entered in the competition, are among the sculpture on display at Woolaroc.



Dedicated to the "boys and girls of today, the fathers and mothers of tomorrow," the museum presents its displays simply and realistically.

dians, at play mounted process the fine Remington J. H. S. Berning on display. On most ceremonial homages—the American. Other collect dore F. dinosa model rial, by



The arms collection includes a gourd powder horn, an Irish shillalah, a tinderbox pistol, an outlaw's Colt revolver, a Theodore Roosevelt hunting rifle and a flintlock musket.

dians, cowboys, frontiersmen and settlers at work, at play, at worship and at war. Each is carefully mounted in a rustic pine bark frame by a special process perfected by museum craftsmen. Some of the finest works of Charles M. Russell, Frederick Remington, William R. Leigh, F. Tenney Johnson, J. H. Sharp, E. I. Couse, Henry C. Balink, O. E. Berninghaus and other widely acclaimed artists are on display.

On display, too, are what is believed to be the most complete collection of Indian blankets, ceremonial objects and dress of the 42 tribes in Oklahoma—also pottery, basketry, saddles and weapons—the relics of some of the people who helped make American history.

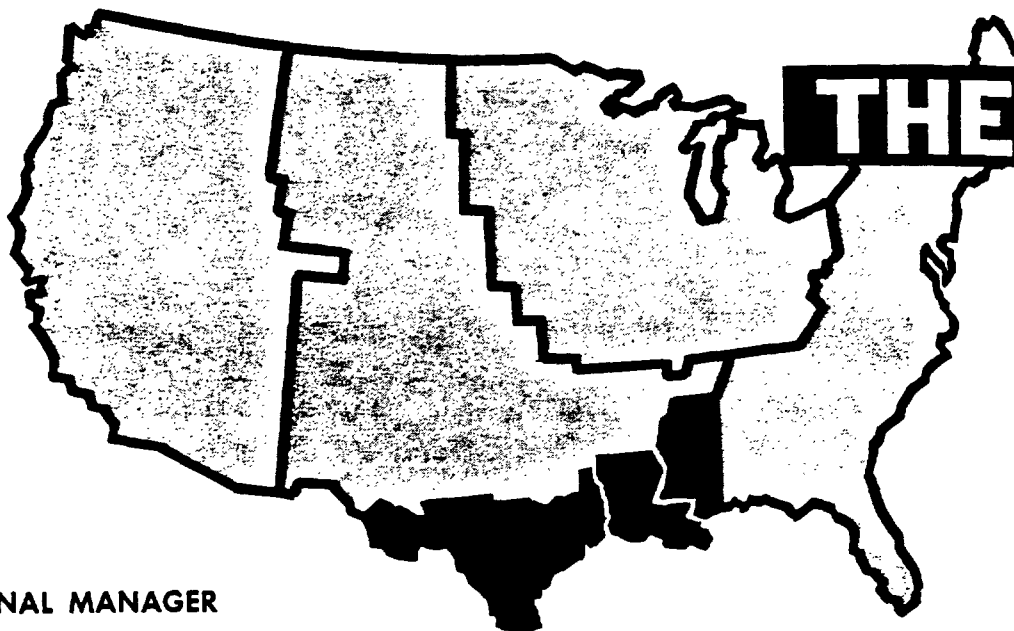
Other of Woolaroc's varied exhibits include: a collection of historic firearms that contains a Theodore Roosevelt hunting rifle; a 95-million-year-old dinosaur egg from the Gobi desert; the original model of the seated Lincoln for the Lincoln Memorial, by Daniel Chester French; the "Woolaroc," an

airplane that won the Dole air race to Hawaii in 1927; all 12 of the original models entered in the competition for the famous Pioneer Woman statue at Ponca City, Okla.; and the Diamond Jim Brady collection of miniatures—painted on ivory—of presidents of the United States.

Several paintings and pieces of sculpture in the museum are devoted to the incomparable Will Rogers. The homespun humorist and philosopher of a generation ago was probably Oklahoma's best loved native son and himself part Indian.

Visiting Woolaroc is an unforgettable experience. So strong is its appeal and so effective its presentation that once away from it most visitors wish they had spent more time with the colorful exhibits or could return to see them again.

Best of all, Woolaroc seems to accomplish what oilman Frank Phillips and the foundation that bears his name designed it to do: make American history come alive and give visitors to the museum a new appreciation of their rich, hard-won heritage. #



THE LA

NEW REGIONAL MANAGER



Ellis K. Locher
Gulf Coast Region

NEW ASSISTANT REGIONAL MANAGERS



J. O. Balzer
Gulf Coast Region



N. J. Linstromberg
Central Region



L. D. Reis
Mid-Continent Region

NEW DISTRICT MANAGERS



A. T. Basye
Kansas City District



A. H. Bingham
Cleveland District



Idan E. Flaa
Tulsa District

NEW NATIONAL CCOU



D. J. Chapman
Eastern Region



L. A. Dollahan
Mid-Continent Region



Paul R. Harris
Central Region



Gelston
Eastern

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LATEST STEP...

... in Ethyl's continuing efforts to improve and expand its services to the oil industry includes the creation of a new Gulf Coast region

AS THE LATEST STEP in its continuing efforts to improve and expand services to the oil industry, Ethyl Corporation has recently made several changes in its nationwide organization. These changes include the creation of a new Gulf Coast region, the realignment of other regions, and new key positions for a number of experienced Ethyl representatives in several parts of the country. As a result of the realignment, the former Southern region has been designated the Mid-Continent region.

Extensive oil industry growth in the Louisiana-Texas Gulf Coast area has contributed to the establishment of the new Gulf Coast region, with headquarters in Houston, Texas. This brings to five the number of regions covering the United States in the Ethyl organization. Previously, the Eastern, Central, Southern and Western regions, with headquarters in New York, Chicago, Tulsa and Los Angeles, respectively, covered the country.

Ellis K. Locher, assistant manager of the Central region for the last five years, has been named manager of the new Gulf Coast region. Assistant regional manager is J. O. Balzer, formerly assistant manager of the Company's Southern region.

The Ethyl New Orleans and Houston districts have been transferred from the former Southern region to the new Gulf Coast region. They will continue under the supervision of D. P. Jeppe in New Orleans and J. E. Hendrick in Houston.

Marshall D. McDorman has been transferred from New York to Houston as a national account

manager, and the following additional appointments also have been made in the new region: chief refinery technologist, D. D. Hornbeck; chief product service engineer, K. C. Jost; and regional operations manager, W. S. Eskridge.

In another realignment of regional jurisdiction, the Denver district under A. F. Ryan has been transferred from the Central region to the Mid-Continent region which is managed by R. A. Douglass. L. D. Reis has been promoted from Tulsa district manager to assistant manager of the Mid-Continent region and Idan E. Flaa has succeeded him as Tulsa district manager.

Also in the Mid-Continent region, A. D. Miller of the Tulsa district and L. A. Dollahan, formerly manager of the Kansas City district in the Central region, have been named national account managers. A. T. Basye succeeds Mr. Dollahan as Kansas City district manager.

In the Central region, N. J. Dinstromberg, formerly manager of the Cleveland district, has been transferred to Chicago and appointed assistant regional manager. D. S. Flynn continues as Central region manager.

A. H. Bingham succeeds Mr. Linstromberg as manager of the Cleveland district and M. J. Anderson has been named account representative in that district.

Paul R. Harris in Central region and Gelston Howell and D. J. Chapman in Eastern region have been appointed national account managers. #

NATIONAL ACCOUNT MANAGERS



Gelston Howell
Eastern Region

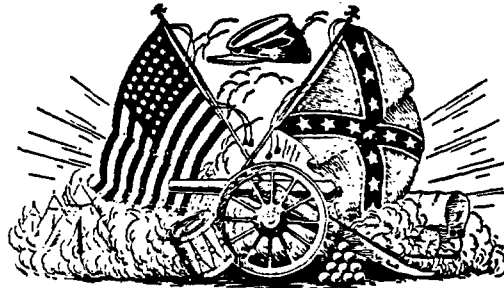


M. D. McDorman
Gulf Coast Region



A. D. Miller
Mid-Continent Region

1861-1865



1961-1965



Centennial provides opportunity for market expansion

The Civil War



THE OIL INDUSTRY, which was less than two years old when the Civil War began in 1861, has a big stake in the Civil War Centennial, beginning early in 1961.

The compelling incentive for widespread travel provided by the 100th anniversary of the tragic North-South conflict gives the industry an exceptional opportunity for tie-in market expansion and community service programs. By encouraging motorists to visit Civil War sites and attend specially planned reenactments and observances, marketers can expand the demand for gasoline, motor oil and all service station products. At the same

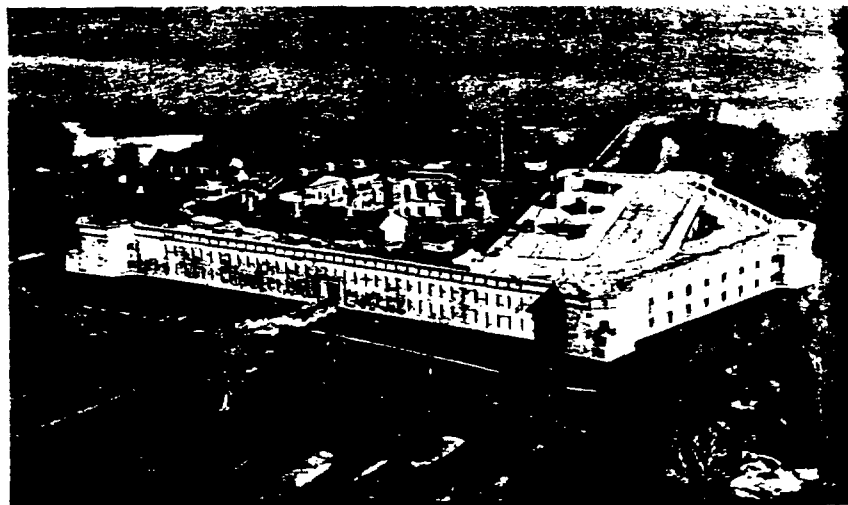
time, they can make a public contribution by helping increase knowledge and understanding of the times, the issues and the conflict itself. This, of course, can add up to a deeper appreciation of our priceless American heritage.

Already, some oil companies are participating in Civil War centennial observances. Others have completed plans to take part and still others have projects under consideration. Standard Oil of Ohio and Sinclair Oil are in the vanguard.

Since early 1959, Standard of Ohio has been supplying 300 newspapers in its territory with illustrated articles on "Ohio in the Civil War." These

stories, some of native leaders to museum grounds. Ohio travel. Now, which Standard expected to knowled points of family and As e.

As part of its participation in the Civil War centennial, Tidewater Oil is contributing to the restoration of Fort Delaware, a former Union bulwark near the company's Delaware refinery and marine terminal.



Standard



market expansion and community service programs

Civil War Revisited



stories, sent at editors' requests, range from vignettes of native sons who were military and political leaders to features about battles, prison life, camps, museums, monuments, homesteads, the underground railroad and heroic accomplishments of Ohio troops.

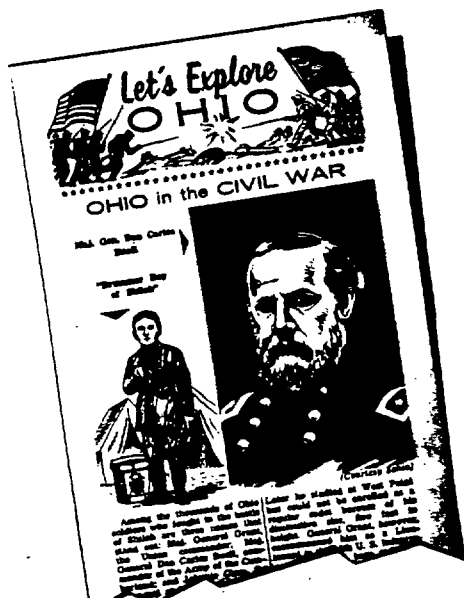
Now the articles are being combined in a booklet which Sohio is offering to public schools. It is expected to help increase the younger generation's knowledge of Ohio's role in the war and to suggest points of interest within the state easily visited by family automobile.

As early as last summer, Sinclair Oil began a

series of advertisements in national magazines on great names and stirring events of a century ago. Individual ads commemorate Bull Run, Vicksburg, Gettysburg, Chickamauga and a succession of others. Old prints are used to illustrate events and points of interest, and there are appropriate descriptions of what remains to be seen today at selected locations.

Readers are invited to write to the company's tour headquarters in New York for road maps and other helps in planning trips to Civil War sites. Sinclair also plans to make a special Civil War map available through its service stations.

Standard of Ohio history-travel vignettes and Sinclair Oil advertisements already are devoted to the Civil War.



The Civil War Revisited

Road maps, of course, are one of the most effective tour aids provided by oil companies. Several other companies, including Esso Standard division of Humble Oil and Refining Company and Pure Oil, are planning to issue new editions specially designed and oriented to the centennial.

Esso describes its guide as "a definitive map of important events of the war . . . including paragraphs on where to go and what to see." The company has additional travel promotion plans in formative stages.

Fort Restoration

Concern with the preservation of a Civil War outpost is a major part of Tidewater Oil's centennial participation. The company is contributing to the restoration of Fort Delaware, about a mile from Tidewater's Delaware refinery and across the channel from its marine terminal. Work is already underway on the \$1-million brick and granite bastion on Pea Patch Island which served as a Union bulwark against Confederate invasion of Delaware bay and river and as a prison for captured Rebel troops.

In continuing its effective Magic Circle market expansion program for the oil industry in 1961, Ethyl Corporation plans to emphasize the educational value of automobile trips to historic Civil War sites. Full-color Magic Circle advertisements in widely read national magazines and travel articles in hundreds of newspapers will mention and picture some of the more outstanding attractions and point out how much fun and benefit an automobile trip to them will provide.

Many other oil companies have projects under consideration or in formative stages. Those in the South, particularly, where most of the battlefields and historic sites are located, are sponsoring or cooperating in local events and promotions.

Oil company magazines in many areas are planning special articles and features on the Civil War centennial theme. Lion Oil, for example, shared sponsorship of an article in the December issue of its parent company's *Monsanto Magazine*. The article contains excerpts from first-hand reports of Civil War experiences of a Northern infantryman and a Southern cavalryman—ancestors of present-day employees.

PHOTO CREDITS: Cover, pages 20, 21, 22, 23, Woolaroc Museum; page 2, Frederic Lewis; page 3, Cities Service; page 5, Metropolitan Toronto Planning Board; page 6, National Film Board of Canada; page 7, Canadian National Railways; page 10, N. Y. Public Library; pages 11, 12, 13, Wide World Photos; pages 14, 15 (bottom left), General Motors Corporation; pages 15 (top), 16, Ford Motor Company; pages 15 (bottom right), 17 (bottom), American Motors Corporation; page 17 (top), Chrysler Corporation; page 26, Tidewater Oil Company.

Our Sun, the quarterly magazine of Sun Oil Company, plans a series of three articles on famous combat areas of the war—Gettysburg, Maryland-Virginia, and Virginia-North Carolina-Georgia. The articles will describe battlegrounds, explain their significance in the conflict and tell in words and pictures what the tourist can see during the next few years.

Officially, Civil War centennial events, which will run through 1965, get underway January 8, 1961, with a message by President Eisenhower, and ceremonies at the service academies at West Point, Annapolis, New London and Colorado Springs.

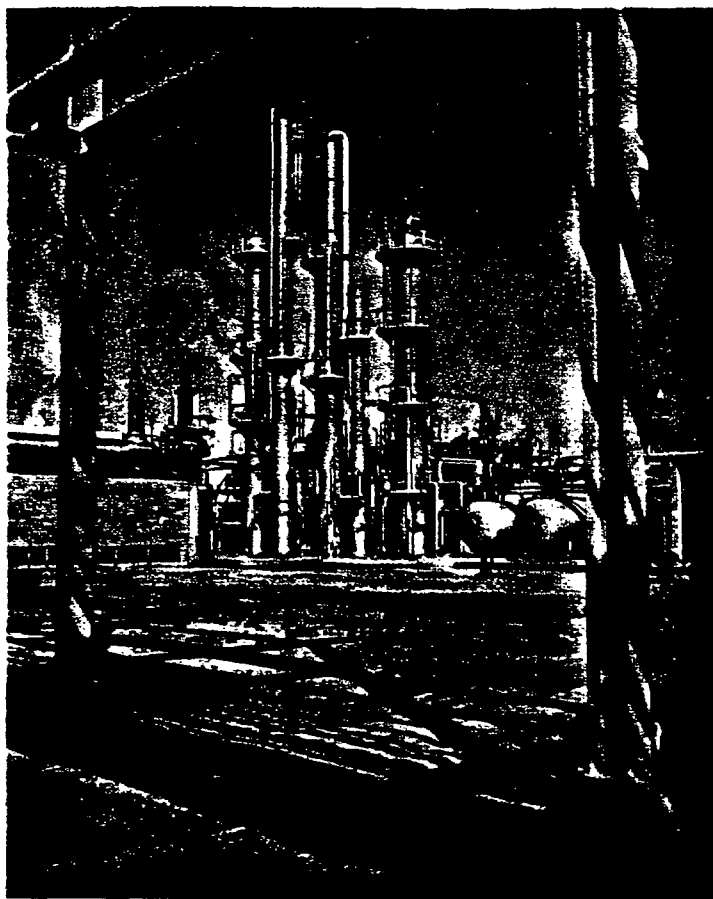
By the end of the year, there will have been a number of reenactments and commemorative ceremonies centering around preliminaries to the war, its outbreak and early fighting.

The Civil War Centennial Commission in Washington, D. C., is the central guiding, assisting and coordinating agency for the many varied plans for observing the great conflict's 100th anniversary. The Commission, which was created by Congressional action, and its 43 state centennial commissions are particularly interested in helping businesses and industries participate. They have worked closely with many companies which already are taking part. The Commission's chairman is Major General Ulysses S. Grant 3rd, grandson of the Union army chief. Executive director is Karl S. Betts. #



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PRODUCING FOR PLASTICS

NEW FACILITIES for the production of vinyl chloride monomer have gone on stream at Ethyl Corporation's manufacturing plant at Houston, Texas.

The compactly built installation increases by one-third the Company's manufacturing capacity for this important chemical intermediate for the plastics industry. Ethyl has been producing vinyl chloride monomer at its plant at Baton Rouge, La., since 1958.

The liquid chemical is shipped by tank car from both Ethyl plants for subsequent conversion into polyvinyl chloride. This durable plastic is used to make modern floor coverings, upholstery material, waterproof fabrics, phonograph records, wire and cable insulation, pipe and many other industrial and household products.

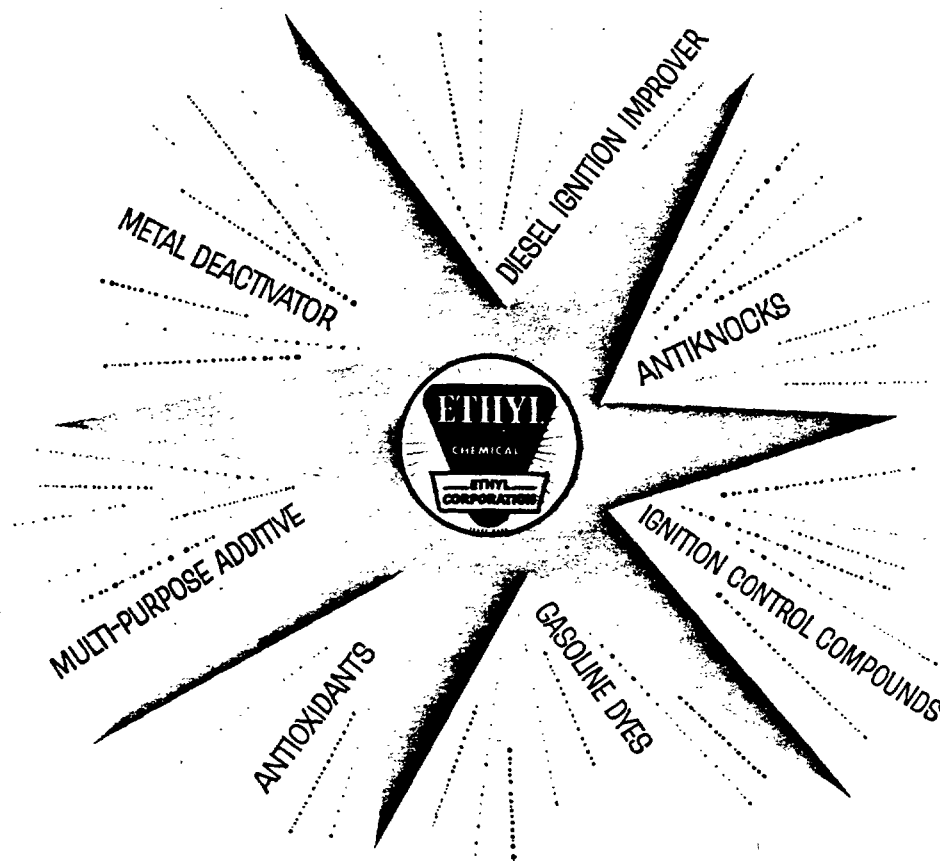
Increasing use of polyvinyl chloride plastic, and thus growing demands for vinyl chloride monomer, prompted Ethyl to start building the new facilities at Houston last May. They officially went into production on November 10.

In producing vinyl chloride monomer, Ethyl draws on its long experience in the manufacture of chlorinated hydrocarbons.



Two "firsts" at new vinyl chloride plant: Top, an operator opens valve to start production. Above, initial tank car of liquid chemical is "buttoned up" for shipment.

from one dependable source



For over 36 years Ethyl has worked toward one end: to help oil refiners produce better, more efficient petroleum products at less cost.

In pursuing this goal, we have developed a broad line of chemicals—each designed to answer a specific petroleum product or process need.

Antiknocks? We provide a choice of six—TEL, TML, three mixed lead alkyls and Motor 33 Mix, a manganese-lead antiknock.

Antioxidants? Ethyl's line is growing steadily . . . now in-

cludes 702 for crankcase oils in gasoline and diesel engines, automatic transmission fluids and industrial oils; 703 for greases and synthetic jet-engine oils; 733 for gasolines, jet fuels, industrial oils . . . plus a new antiwear agent and oxidation inhibitor for lube oils, "Ethyl" Antioxidant ZDP (zinc dithiophosphate). Other additives? Three phosphorus compounds—ICC 1, ICC 3 and ICC 4, all effective in controlling surface ignition and spark plug fouling. Also Multi-Purpose Additive, an

economical detergent, anti-icing, anti-corrosion agent. Add a diesel ignition improver, an effective cetane improver for diesel fuels . . . also for gasolines—a metal deactivator and a full range of oil soluble dyes in powdered, flaked, beaded or granulated form.

These and other Ethyl products are backed by complete technical service . . . service that helps refiners make products more effective, more economical, better able to build sales in today's highly competitive markets.

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