

ETHYL
NEWS

45

ETC 31988

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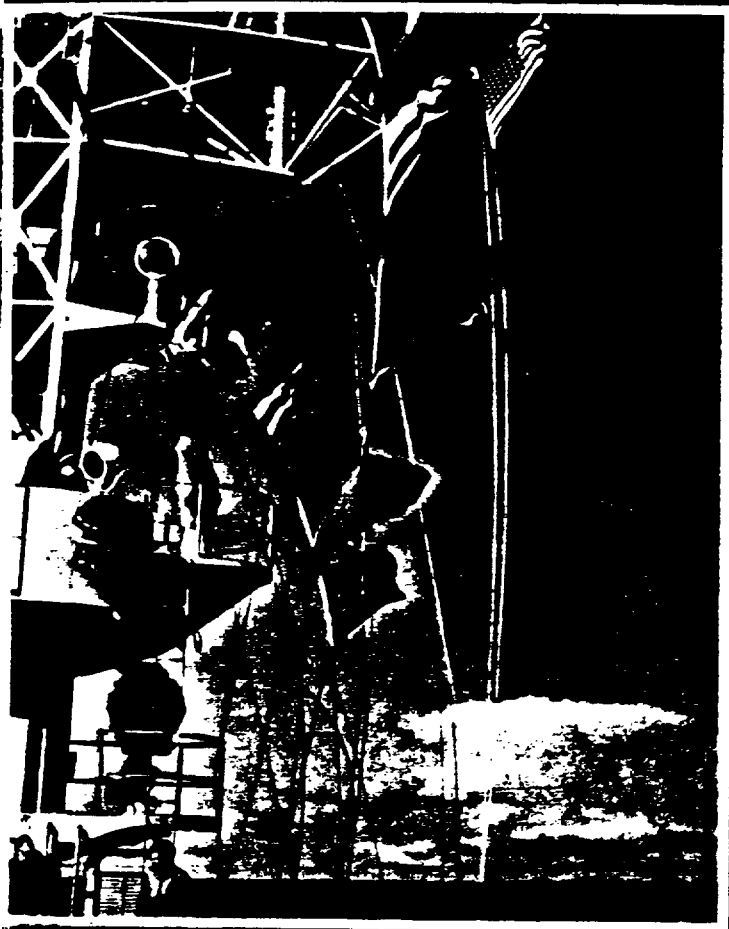
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ETHYL NEWS

JANUARY ★ 1945

ETC 31991



IN THE

ETHYL NEWS

JANUARY 1945

George Krieger has returned to the Ethyl Corporation following a two-year leave of absence with the WPB. In his new post at Ethyl, he will be in charge of rural marketing and special development work as assistant to Julian J. Frey, general sales manager.

While with the WPB, Mr. Krieger served as chairman of its Farm Machinery and Equipment Division and later as a special assistant to Donald M. Nelson.

One of the pioneers in the development of the high compression tractor engine, Mr. Krieger has a wide acquaintance in the farm equipment industry and is known as an expert on the use of farm machinery. He has held important posts in the American Society of Agricultural Engineers and the Society of Automotive Engineers.

A native of Virginia, he was graduated from Virginia Polytechnic Institute in 1926 as an agricultural engineer, and entered the employ of Standard Oil Co. of New Jersey at the Bayway, N. J. refinery research laboratories. In 1929, he joined Ethyl Corporation as an agricultural engineer and in 1932 was named director of tractor activities in the Technical Sales Department. Before leaving to serve with the WPB in 1942, Mr. Krieger was head of Ethyl's Agricultural Division.

POSTWAR SERVICE STATIONS

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What has the service station business learned from the war? In what directions is postwar planning by major companies proceeding? Does diversified merchandising hold the key to more stabilized operations? Here is a report.

THAT DAY IN DAYTON

7

We could always tell you when the first sale of Ethyl gasoline was made. We could also tell you where it took place. But we could never tell you the name of the man who actually put us in business. Now, after nearly 21 years, we know . . .

SLIPS THAT PASS IN THE MIKE

8

Radio programs are planned to perfection; broadcasters come well prepared and rehearsed. But sometimes, an all-too-human slip of the tongue takes place . . . and the unexpected happens.

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Here's a letter from a serviceman with a very unusual gripe. He doesn't want any of the comforts denied to civilians. He doesn't want anything he hasn't yet "earned." All he wants is a chance to jump in and fight — but he's chained down to the home front and can't.

IT'S HARD AS A-B-C

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Those gaily colored flags on our cover spell a special message to you from all of us at Ethyl. And here's an interesting article explaining these flags — and interpreting navy flag signals in general.

OIL FOR EUROPE

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Where will Europe get her oil after the war? How much will she need immediately after the armistice? What will it take to rebuild her producing and refining facilities? Here is one writer's opinion.

FARM BOOM ON WHEELS

18

The war has taught American farmers, as never before, the economic importance of mechanized implements. Not only have they overcome labor shortages — they have lifted crop production far above pre-war levels. And now, out of the war may come this new development: a wide expansion in power farming for the small farm!

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

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

Boris W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzales, secretary

1945



POSTWAR SERVICE STATIONS

KING GASOLINE died during the war, but no tears stained the desks of oil company marketing executives who had preached the wisdom of balanced selling — with nominal success — for years before Pearl Harbor.

In pre-war days, balanced selling meant doing a certain ratio of motor oil, lubrication, and tire, battery and accessory business to every 1,000 gallons of gasoline that went through the pumps. After the war it can mean almost anything. And it probably will.

What's ahead for service stations after the war? Here's an appraisal by a reporter who has followed oil marketing trends

For war, which held out a one-way ticket to the retail branch of the petroleum industry, has opened new horizons. Although King Gasoline passed on, service stations did not automatically join him in an orgy of economic hara-kiri, as many expected. The casualty rate has been comparatively low — estimated to be around 25 per cent. To their own surprise, most gasoline dealers began cashing in on the fruits of balanced

selling, a term with which they had been only conversant in earlier days. Moreover — and this surprised many others — they went beyond the original concept of balanced selling and busied themselves with the merchandising of household supplies and appliances, garden and lawn equipment, toys — almost every salable article they could lay their hands on.

Out of this wartime experience,

lessons have been learned which will find significant application in the postwar period, lessons which already are shaping the service station of the future. This does not mean that a blueprint of the service station of the future can be put forward now. But the lessons can be analyzed sufficiently to determine accurately the direction in which we are moving.

Tomorrow's Promise

What they have taught can best be answered by discussing the postwar plans as they are being developed by the various major oil companies. At this point let it suffice to say that they augur well for improved service to the public's most convenient transportation medium — the private automobile — and promise brighter employment opportunities to thousands of young men who, through service with the Armed Forces, have been trained as no other group has been trained before in the care of precision equipment.

The background upon which postwar plans are being built is one of a sudden about-face in retail operations. During the war, the evolution of the service station turned almost into a revolution. A Department of Commerce survey of more than 175,000 stations in 1939 showed that on the average only 16 per cent of the gross income came from the sale of tires, batteries, other accessories, servicing and miscellaneous items like cigarettes, candy, razor blades and aspirin. Gasoline and motor oil accounted for about 84 per cent of the gross.

Today, according to industry estimates, servicing and the sale of related and unrelated items account for 40 to 50 per cent of the gross. Yet many dealers are making as much or more money as in the past.



This turnabout has surprised even some of the most merchandising-minded among oil industry executives. Thousands of service stations have become successful community shopping centers, or wartime general stores, as you will, selling coffee makers, ironing boards, pins, lines, clothes baskets, lunch kits, brooms, mops, glassware, ovenware, polish, brushes, knives, stepladders, toys, hardware, paints, sporting goods, garden seeds and equipment, work clothes, raincoats, and leather goods — almost an endless list.

As might be expected, this development has not been interpreted uniformly throughout the oil industry. Some say travel restrictions and a seller's market alone were responsible, that it is a wartime circumstance which will disappear with peace. Others argue that there has been a steady trend toward decentralization of retail selling, accelerated by war, but one which nonetheless places service stations in a strategic position to move in on new markets. They hold that the long-term outlook is favorable for extensive diversification by service stations into new fields unrelated to the automobile itself, and that such diversification holds out benefits beyond the immediate extra profit opportunity for dealers.

Postwar Merchandising Trends

Depending on the viewpoint taken, postwar planning of retailing programs is proceeding in three main directions. In the lead are the companies which believe that gasoline, motor oil and servicing are not enough for survival and which therefore are planning to merchandise all items related to the automobile plus others in which there is a quick turnover, little need for extended display space and no postsale servicing involved.

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A second group plans to go beyond this point in diversifying merchandising into unrelated fields, selling some items that may require post-sale servicing. In definitely third place are those which intend to stick to automotive products and servicing.

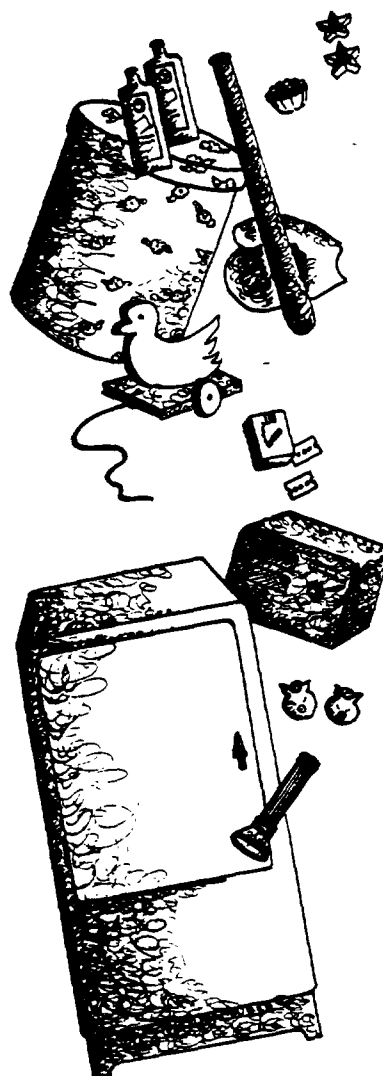
Two major companies, notably, are planning to handle such heavy items as refrigerators, stoves, ironers, console radios and washing machines. These will be warehoused by the companies and delivered in company trucks to dealers for display and sale.

Storage and Warehousing

Such programs call for an important expansion of station sales-room space, and pose new problems of training and financing. To a lesser extent, many other companies are looking toward an expansion of display space for smaller items of the chain store variety. Some will warehouse the merchandise themselves. Others will promote such programs for their dealers with supply houses, and except for guidance by the oil supplier, the relationship will be entirely between dealer and merchandise supplier.

The oil companies which favor warehousing the merchandise themselves claim as advantages a standardization of quality and variety at stations carrying the company banner, closer cooperation with dealers in planning sales and promotional programs, and assurance that quality will be such as to protect the company brand name. Others say this is a field into which they do not care to venture, having no experience, and that coordination of sales programs can be accomplished between oil and merchandise suppliers at the top level.

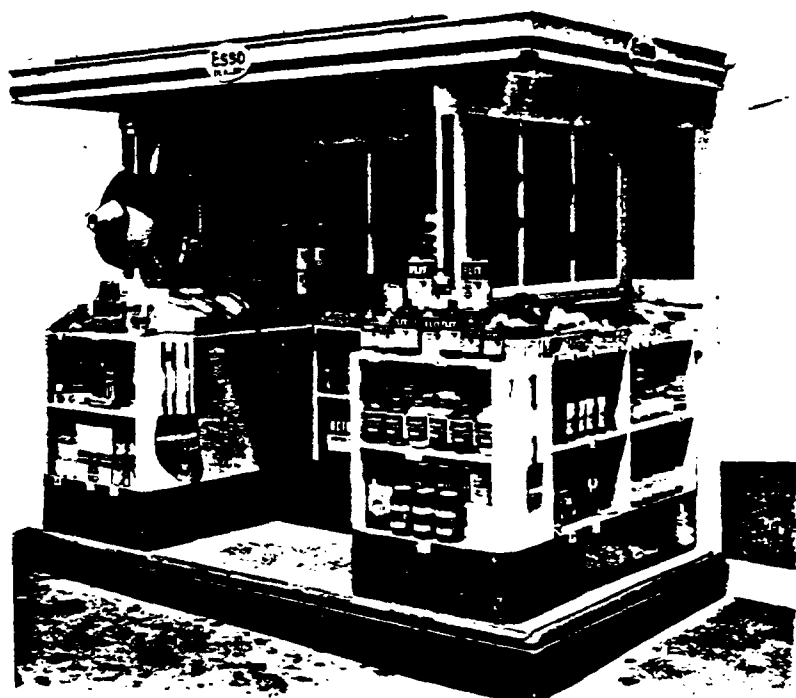
Many combinations are possible, and almost as many can be expected



to materialize. Regardless of the forms these programs take, and the extent to which they go, the important point is that abundant evidence shows war has put new emphasis on the possibilities of diversified merchandising at service stations, and that this lesson will be carried over after the war in a more definite interest on the part of oil companies in balanced gross profits at stations.

First Things First

The steps toward applying that interest realistically follow in logical order of importance. Aside from the dealer-education job, which applies at all levels, the first step is to work toward fully equipping stations to service properly the old and the new automobiles that will be in operation in the postwar period. Next come programs for tire, battery and accessory sales. Then merchandising programs for unrelated small items which do not require large inventory investment and in which there is quick turnover. Finally, at the





The many new and diverse lines added by service stations during the war are but a forerunner to the postwar shopping centers these stations may become

top of the scale, are sales programs for heavier goods. Most companies are midway on the scale in their postwar planning, and two, as mentioned earlier, are at the top.

Process of Evolution

This further step in the evolution of the gasoline outlet — from filling station, to service station, to “service store” — is an indication that oil marketing is moving along toward maturity, in the sense of the pre-war concept. Lower costs of operation, narrower margins, and competition, which can be expected to increase rather than decrease, make gallonage a less significant unit of measure for the average service station. Parallels can be found in the development of the pharmacy into the modern drug store under conditions of cut-rate competition, and the cigar store which branched out into the sale of work clothes, clocks, fountain pens

and innumerable other items.

Do not be alarmed, though, that in the future you may not be able to distinguish between your favorite service station and the corner drug store combined with the hardware store, the electrical supply shop and the jewelry store. One definition of a service station is this: a place where you buy automotive products and have your car serviced. Another is this: an important point of liquidation for past investments by integrated companies in crude oil exploration and development, refining, transportation, and research. If that latter definition is kept in mind, it becomes apparent that the main job must be the selling of petroleum products and the service that makes continued, efficient use of those products possible. However the “extras,” as they were called in the days before the war, are becoming more essential in making

possible the type of super station service the industry is aiming for after the war.

More Stable Unit

Over-all, the postwar service station promises to be a more stable economic unit, less affected by serious gasoline price wars, and more attractive to a high-type independent merchant. Look for service stations to represent larger investments, to require greater operating capital. Look for the petroleum industry to spend millions of dollars in rehabilitating and equipping stations, and building new ones. Look also for these: new stress on tire, battery and accessory sales, training, housekeeping, and precision service. Above all, look for the retail function of the petroleum industry to stand squarely on its own two feet as a profitable unit in the industry's over-all economic structure.

THAT DAY IN DAYTON

THERE was no fanfare that day. No microphones were set up to carry the news either locally or to the far corners of the nation. No movie cameras ground out a visual record of the event for posterity.

But it was, after all, an historic event that afternoon of February 2, 1923, at a filling station at the corner of Sixth and Main Streets in Dayton, Ohio. For it was there that the very first sale of Ethyl gasoline was made. Yet, no one took the trouble to get the name of the first purchaser.

Down through the years we have had a natural curiosity as to the identity of that first purchaser, and we have wondered what prompted him to buy it. Was it because his engine knocked and he had faith in Ethyl gasoline to overcome the difficulty? Or was he just a pioneer at heart who was willing to "try out" the new product?

Although we have been searching for our first Ethyl purchaser for some years, it was only recently that Harry A. Mack, manager of the Dayton Division of the Ethyl Corporation, found our man, and he was "just around the corner." He is F. M. Redelle, manager of the McCook Bowling Alleys in Dayton, and lifelong friend of Mr. Mack and others who were identified with the early days of marketing Ethyl fluid.

Mr. Redelle recalls the event as though it happened only yesterday. He remembers driving up to the filling station and ordering Ethyl gasoline in the presence of both Willard Talbot, Refiner's manager, and the late Russ Wells, a member of the



F. M. Redelle as he is today at his place of business

General Motors Research Corporation staff.

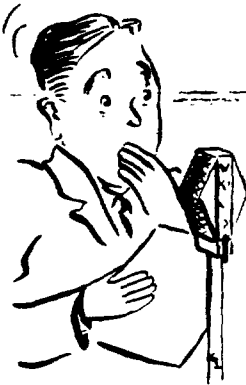
Perhaps it would be more dramatic if we reported that Mr. Redelle was an "innocent bystander" and that he had to be coaxed into making the first public purchase of Ethyl gasoline. But the truth is that he was no stranger at all to Ethyl fluid. As a personal friend of some of the members of the GM Research Corporation staff, he and other Dayton-

ians had been using their cars as "guinea pigs" to "try out" various tetraethyl lead combinations after Thomas Midgley, Jr. and his laboratory associates discovered the anti-knock properties of tetraethyl lead.

And so "Mike" Redelle admits he was "sold" on Ethyl gasoline even before he first bought it that memorable afternoon nearly 21 years ago. He says he just wanted to be the first to buy it publicly. And he was.

*At this station in 1923
Ethyl first went on sale*





Slips

THAT PASS IN THE MIKE

By Harriet Van Horne
Radio Editor, N. Y. World Telegram

MOCK, if you will, the senseless conjurations of radio announcers. I mean those lyrical phrases about the tobacco that's milder, the soap that gets white clothes whiter, and the face powder that gives you an uncontested field of male shoulders to rub it off on. Mouthing such inanities over the air may sound like the easiest job in the world. But believe me, it requires a tone that comes in pear-shapes only, and a degree of concentration usually found exclusively in makers of precision instruments.

For an announcer who isn't concentrating will "fluff." That is, he will wrap his tongue around a combination of sounds that will echo from coast to coast, and come home to roost in stories such as this. It is easier to live down a barroom brawl, any radio man will tell you, than to erase from public memory a slip that has passed in the mike.

What, specifically, is a fluff? Well, it's an excited announcer introducing an ex-President of the United States, and saying, "And now, ladies and gentlemen, Mr. Hoobert Heever."

Hastily realizing his error, this chap is supposed to have added, "I mean Heever Hoover!"

Mr. Hoover doesn't appear to have had very good luck with radio. At the conclusion of one of his speeches, an announcer is reported to have said, "Ladies and gentlemen, you have just listened to the only

Despite all the careful planning that goes into a radio program, sometimes an all too human slip of the tongue comes through

former living president of the United States."

Up in New England there is a staid preacher who probably turns crimson when reminded of the day he finished broadcasting his sermon, and, thinking he was off the air, remarked blissfully, "—, am I glad this Sunday is over!"

Helen Sioussat, director of talks for CBS, can regale you for hours with fluff stories. There was the time an announcer, telling of his return from the South, said, "I came into New York with a dirty linen suit and no trunks." And the time a colorful Congressman, thumbing through his speech for a missing page, bellowed from coast to coast, "I knew that — would get these pages mixed!"

Then there's the conductor of a "household helps" radio program, who once remarked, "Now here is a recipe for two people to be cooked in a chafing dish."

And an overeager young man in a daytime serial, meaning to compliment a young lady on her slipper-blue satin dress, said, "Slap her blue sittin', hmm?"

A distinguished statesman told his CBS listeners that he was "quite unaccustomed to public speakeasies." A serious dramatic actress, who was supposed to say, "We'll give the bell a pull," instead heard herself declaiming, "We'll give the bull a pill."

A reformer, anxious to prove his good intent, vowed solemnly to "leave no turn unstoned."

At a high diplomatic function in Washington, the announcer meant to say, "There goes the Chief Justice, just removing his pince nez." He pronounced pince correctly ("pants"), but not being sure of the second word, just left it out. He couldn't have caught the Chief Justice in a more awkward stance (pronounced stance).

Plugging a certain tasty salt-water taffy, the announcer was supposed to say, "It's chewy, delectable and cut to fit the mouth." Over the air it came: "It is fit to cut the throat."

A commercial announcement on a suburban station was aimed to call attention to Mme. Fifi's new millinery salon. "Ladies!" said the announcer brightly, "why not hurry right over to Mme. Fifi's military saloon?"

Said a precise British voice from London one evening, "Most men feel that the war will last longer than women."

Proud indeed was the announcer in the Middle West who was elected to describe the Governor's inaugural parade. The procession came down the main street of the capital to the tune of the Sharpshooters' March.

"Here comes the Governor!"

cried the announcer, "followed by the lieutenant governor and visiting dignitaries from Washington. And they're parading in time to The Crapshooters' March!"

A news announcer, reading an obituary, reported, "Mr. Atwood had an abdominal attack in the downtown district."

Another news reporter, describing a train wreck in Germany, declared authoritatively, "At least 150 people were killed, 77 of them seriously."

Uncommon Commercials

Possibly it's the uninspired writing of commercials that invites announcers to put their minds elsewhere while they scan them, doing their own interpolations. "Don't let fire destroy your home," cautioned a New York announcer in a small station, "soot in chimneys frequently is the cause of such disaster. Why take a chance with your wife and children? Have a fire inspector examine them carefully every three months."

One of radio's best juvenile actors once got so excited, giving realism to his role, that he yelled: "There's a packet bottle ship coming into the harbor!" On another occasion he admonished a fainthearted comrade, "Keep a stuff ipper lup, ole boy!"

One of the most quoted fluffs in radio was the verbal stumble of a complainant on a program devoted to personal problems. A young man, who was documenting a complaint against his loose-talking neighbor meant to say, "Moreover, she castigated my father." He got the first syllable correct.

Lee Segall, creator of the quiz show, Fish Pond, and originator of Dr. I. Q., tells of a classic reply he once heard on a quiz show. The query was: "Within a million miles, how far is the sun from the Earth?"

After careful deliberation the contestant replied, coast-to-coast, "I don't know exactly, but it's a hell of a long way."

Old timers in radio never will forget the story of the out-of-town station with studios atop a hotel. On this day it was broadcasting a program of organ music from a nearby movie house, the hookup arranged through telephone wires.

It was while the organist was pumping his heart out for Liebes-traum that the wires at the hotel switchboard somehow got crossed. A wifely voice, tender as a concrete mixer, rang out over the air, "Are you in the hotel with that woman?" And to the dulcet strains of Love's Dream, there ensued a conversation my girlish modesty won't permit me to report here. The husband insisted he was stopping at the hotel on business, had seen nobody but "the

boys." The wife offered evidence to the contrary.

Finally the connection was pulled down, and a few minutes of dead air followed while station officials hunted around for the staff pianist — who is always waiting to go on, except in an emergency.

Strange as it seems, there have been fluffs in sound effects, too. A Southern station once aired a dramatization of Lincoln's assassination. Sound effects — one shot — were to come from a record.

"Then the assassin, having climbed to the President's box, took aim," read the narrator, "and a shot rang out!" Here the sound man set the needle on the record, but on the wrong spot. A rat-a-tat of machine gun fire came over the air. This was the first news the South received that Lincoln had been killed by a Tommy gun.



"Yeah? Well, let me tell you a thing or two!"

Letter to the Editor

An Ethyl employee in the Service, who would obviously rather fight than push paper and ink, sent us this unusual "gripe." Naturally he would prefer his name omitted with its publication. — EDITOR.

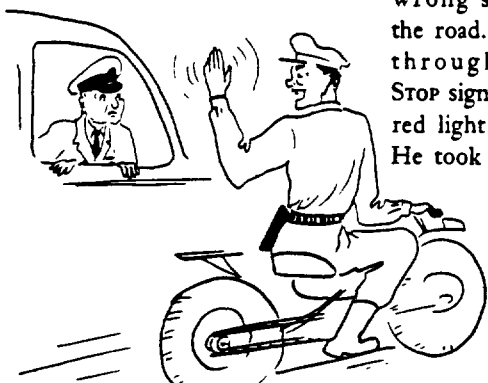
★ ★ ★



WHEN I went into the ration board they were turning down applications right and left. "There's a war going on . . . No more gas, absolutely!" Then they saw me, in uniform, and cleared a space at the counter. What did I want? Certainly, Lieutenant. Glad to, Lieutenant.

They gave me a "C" sticker so I could live at home and drive to my base, and a sheet of coupons the size of a road map. They wrung my hand with a "God bless you, son!" in their eyes . . .

The motorcycle cops in my town are tough on speeders, so I just kept quiet and listened. "Sixty miles an hour!" the officer barked, scowling at me behind those big dark glasses. "Passing three trucks on the wrong side of the road. Going through two Stop signs and a red light . . ." He took a deep



breath and I swallowed hard, waiting for the explosion. Instead, he patted my arm with rough good-fellowship and said, "Look, I know how it is, being in uniform. You get a little reckless when you've been through a lot of danger and strain (he touched the dark blue ribbons on my chest) — but take it easy next time, hey?"

He saluted me and went roaring off before I could tell him I hadn't been in any danger — that I have one of those bullet-proof jobs, with no strain except trying to keep awake. The ribbons are marksmanship awards.

Some time back, during the darkest days of the whiskey shortage, I walked into a liquor store. You may remember what it was like. The proprietor was shooing people away: "Rye? Listen, we got rum and apricot liqueur.

There's a war on." Then he saw me, in uniform, and leaned across the counter to pump my hand.

"Well, Lieutenant!" he boomed. "Long time no see. What'll you have?"

I mumbled something about rye or gin, feeling foolish as hell. The proprietor put on a coy expression as he performed some sleight-of-hand under the counter, then laid two bottles in front of me with an elaborate wink. "Canadian Club whiskey. Gordon's gin. Prewar stock — at the old prewar prices to you, Lieutenant. Nothing too good for you fellows out there, giving your best."

I couldn't bring myself to tell him I was stationed right in town, giving my best only a couple of miles from his shop . . .



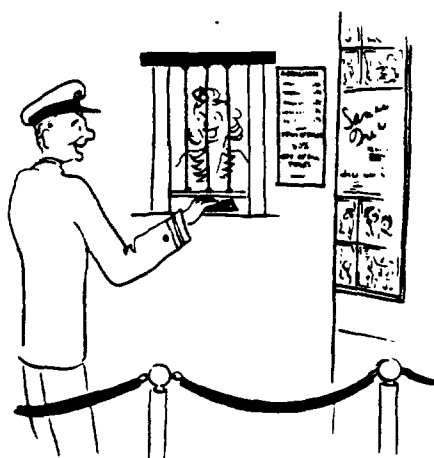
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It's a racket. I'm getting fat. "There's a war on" — for every one but me. I joined up looking for a fight, expecting hardship and sacrifice, but the only war I've been able to get into seems to be directed against the civilians and taxpayers. True, my salary is down about 25%, but then I don't pay any income tax. They even mailed me a refund for the ten dollars I paid last year.

And the only sacrifice I can find is what some civilian is giving up for me. Ladies of the Red Cross and USO stay up all night in canteens or trucks to give me coffee, sandwiches, doughnuts. The dry cleaners who tell you "two or three weeks" mark my uniforms "RUSH" and return them in three days. Cigarettes, watches, fountain pens, candy bars, all the things you find hard to buy, are being sold to me, about 40% off, in ships' service stores and post exchanges. Theatre tickets are free, or half price . . .

Down at the fountain-pen repair place last week, the man ahead of me was told to come back for his pen in three weeks. It was just a little gimmick that needed replacing, but war conditions, you know . . . I showed my pen to the lady, wondering whether it could be fixed at all, for the baby had bent the delicate point up like a button-hook. "We'll have it for you in two days," said the lady, sweetly. "And there's no charge to servicemen . . ."

An old knee injury begins to act up. Three doctors 'way above my price range in civilian life give me a couple of hundred dollars' worth of X-rays, diagnosis, and treatment — on the house, or on you taxpayers.



How are you fixed for shoes, brother? The top-grain leather and solid soles you can't buy are going into my twelve-dollar oxfords, which cost me \$3.50 and no ration stamp.

Do I want to go anywhere? People stop on the road and ask if I want a lift. The railroads sell me "furlough tickets" at half price. Bus drivers hold their hands over the coin boxes.

You know there's a war on, but I don't. I've been trained for months as a naval officer of the line, but the only ships I board are moored to a dock. I have a make-believe supervisory job that could be handled by any well-trained police dog.

Heaven blast me if I haven't tried, sincerely and repeatedly, for combat duty at sea. Maybe if I agitate long enough they'll at least get annoyed and let me



out of the service — so I can go back to civilian life and do something useful toward winning the war.

. . .

I feel guilty. I'm getting the handouts and hero worship that belong to someone else . . . the sailors and soldiers who have been out in the middle of it, taking their dose of sweat, mud and blood. Many of them are home already, but a lot more, especially in the Pacific, won't get home until months after the war is over.

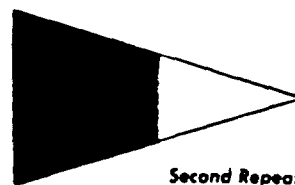
By that time the shouting will be all over too, and every one at home will want to forget about the war.



Able (Afirm)



First Repeat



Second Repeat

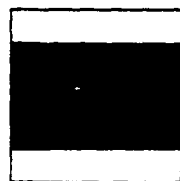
IT'S HARI



Baker



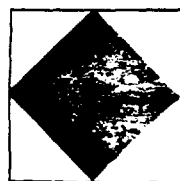
Charlie



Dog



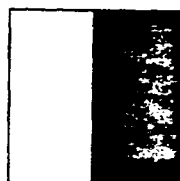
Easy



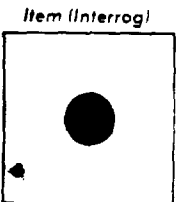
Fox



George



How



Item (Interrog)

THOSE gay-colored flags on our front cover spell a cordial message from all of us at Ethyl — *Happy New Year!* May that traditional greeting never lose its warm and heartfelt meaning.

This year, many of the men who would ordinarily be spending the holidays with us will be at sea — and when they greet each other with the code signal flags, the message will look as we have shown it on the cover. That top flag, with the vertical white and red stripes, is the letter *H*. The next, white and blue, is *A*. You read from top to bottom. The blue flag with the white square in the center, is simply the letter *P*.

But, if we're spelling "Happy," where's the next *P*? Why that slim gold and blue pennant?

In signaling with code flags, the same flag is never repeated if it can be avoided. (All military communication is governed by rigid rules of procedure like this.) So instead of doubling the letter *P* we use a sort of ditto mark — the First Repeater pennant. There are four repeaters in all, because a flag signal or "hoist" rarely has more than five flags in it.

This marks one of the basic differences, as a means of communication, between code flags and radio, blinker light, or the semaphore "wig-wag" flags as used by the Navy signalmen.

With these other systems you spell things out letter by letter. Flag

hoists are used mainly in short code-letter combinations, to flash a coded message *complete*. Only in such a rare case as "Happy New Year" are they used, letter by letter, to spell a word.

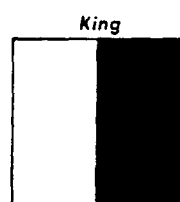
Even then, however, you wouldn't recognize this greeting if you could hear it being read aloud by the signalman — he'd be saying "How, Able, Peter, Peter, Yoke," and so on. Each letter of the alphabet has a name, for clarity. A minor confusion in signal orders could sink a battleship. In a high wind, over a communications system full of static, the letters *B*, *C*, *D*, *E*, *G*, *P*, *T*, *V*, and *Z* all sound alike. But they're unmistakable when you call them Baker, Charlie, Dog, Easy, George, Peter, Tare, Victor, and Zebra.

Two-Flag Hoists

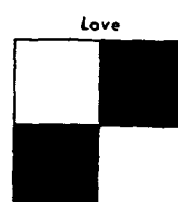
Let's look at a quick example. As a two-flag hoist, *XV* means "I require towing," while *XT* means "I am towing a target," when you look them up in the International Code Book. A signalman with binoculars up in the crow's nest reads them to his signal officer by telephone — and because of wind or other noises *XT* sounds like *XV*. So the message is decoded, the skipper is told that the other vessel "requires towing," and off he dashes in the best tradition of the sea to make a rescue — only to wind up in the line of fire while a



Jig



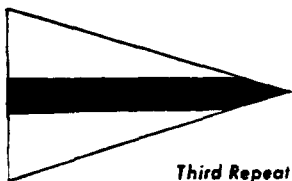
King



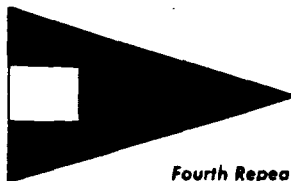
Love



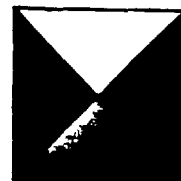
Mike



Third Repeat



Fourth Repeat



Zebra

RD AS A-B-C

couple of battleships are having target practice!

Most of the urgent signals are represented in simple one-flag hoists. Baker, a plain red flag, signifies that you are "carrying explosives" — a warning for other ships to give you a wide berth in the channel. Uncle, a red-and-white checkered affair, cautions "You are standing into danger."

Capsule Comment

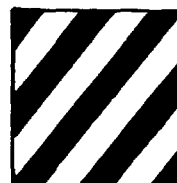
Often-used signals are two-flag combinations: Dog - King means "you should not risk anchoring unless you have very good ground tackle" — quite an economy of letters! The three-letter signal combinations comprise a whole dictionary running the gamut of nautical experience, from *ADX* ("I am gleaming") to *WAU* ("Wet") and *WAV* ("Rye"). Take any combination. *ETL*, for example, the chemist's abbreviation for Ethyl, means "Deserving."

How about the four-letter signals? No, they are *not* profanity. They begin with *A* and designate geographical names, from *AAAB* (Aalbaek Bugt, Denmark) to *ARSG* (Le Barcarès de Saint Laurent, France) — another example of the speed and economy of this system. Berlin is *ABQQ*, Tokyo is *AQGA* — and what a swell day it will be when they are both *QWR*, "A complete wreck"....

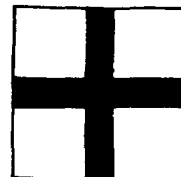
The longest list of signals under one heading is the 84 variations beginning with "she" — everything from *CSA*, "She can," to *QVN*, "She would not have to." Remember, these signals are primarily for sailors! In this war, however, there are so many combined operations — Coast Guard, Marines, Army and Navy (in that order) hitting foreign beaches — as well as operations with our various Allies — that in the interest of uniformity and clarity some changes in signal procedure have been made. Some letters have changed their names—*A* is no longer *Afirm*, but *Able*. *Prep* has become *Peter* again, canceling a previous revision. There are ten changes in all. Just to confuse you, however, five of them retain their old names when used as "governing" flags — that is, when their single-hoist meaning (though used in a multi-flag hoist) affects the import of the rest. . . . Sounds like the income-tax form, doesn't it?

Actually it's all methodical and simple when you get the hang of it. "Flags," as the Navy signalman is called, can explain it all to you. He can also tell you why it's necessary to hoist the flags *AHC* on your hal-yard just to signify the letter "A," whereas if you were simply to hoist the *A* flag it would mean "I am undergoing a speed trial."

Complicated? No. To him it's as simple as *Able-Baker-Charlie*!



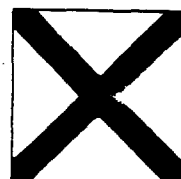
Yoke



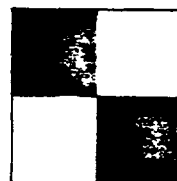
XRay



William



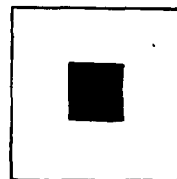
Victor



Uncle



Tore



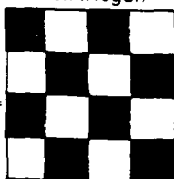
Sugar.



Roger



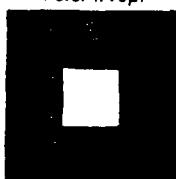
Nan (Negat)



Oboe (Option)



Peter (Prep)



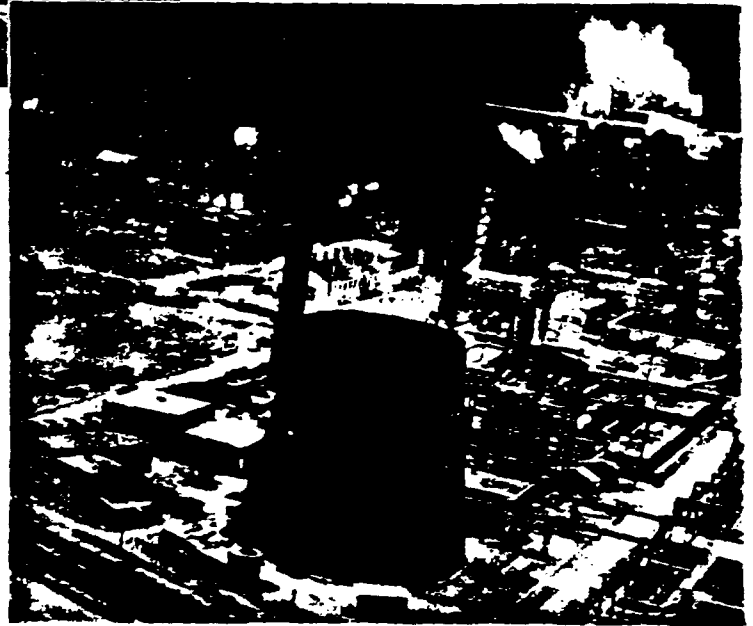
Queen



Oil for

A Polish oil field. Poland before the war was a moderate oil producer

Rebuilding Rumania's bombed-out oil installations will be a major reconstruction job after the war



Baku on the Caspian Sea symbolizes Russia's oil wealth. After the war, Russia will not only be self-sufficient in oil — but may have an exportable surplus



ETC 32004

'or Europe

By Henry E. Rose

WAR-BORN producing and refining facilities in South America and in the Middle East probably will absorb a substantial part of the United States' oil markets in Europe when peace comes.

Extraordinary demand on the American oil industry to fuel the war has made it impossible to add to underground reserves in spite of record exploratory drilling in recent years.

When the war ends, it is expected that domestic crude oil production will be cut back substantially as a conservation measure. This reduction may amount to as much as one million barrels a day from present levels, according to industry economists. Domestic oil demand, on the other hand, is expected to exceed the amount of crude being produced. In consequence, the United States will have to rely on imported oil to meet its total demand, as time goes on. According to industry economists, these imports will range from 150,000 barrels a day upward; their calculations, moreover, make no provisions for any exports in the postwar period.

Conservation of proved oil reserves in the United States, it is believed, will be the order of the day. There will be no exportable oil, except specialty products, and the country must be prepared to fuel another war if that ever becomes necessary.

This condition, translated into pre-Pearl Harbor days, means that the United States stands to lose an export business in oil products approximating \$400 million annually, or a volume of more than 200 million

barrels, excluding such by-products as grease, wax, petroleum coke, blending agents and asphalt.

At best, the United States will supply only such products as aviation gasoline, of which it is the largest producer in the world, and possibly special lubricants.

In pre-war years American oil shipments to Great Britain and Europe approximated slightly more than 80 million barrels, or about 40% of America's total export business in this commodity. These exports accounted for about 30% of the consumption on the Continent and in Great Britain.

Oil Balance Sheet

Consumption of oil products by Great Britain and Europe (excluding Russia), in normal times approximated 287 million barrels, against which indigenous production amounted to some 57 million barrels. There was a deficit to be supplied by imports of 230 million barrels. Besides the American industry as a supplier, Europe's imports, in pre-war days, came from Mexico, Venezuela, Colombia, the Middle and Far East.

The Soviet was the only nation which was self-sufficient in production and refining capacity. It exported little, or no, oil to other nations. Soviet production in 1938 amounted to 212 million barrels while consumption approximated 170 million barrels.

Russia's ability to export in the postwar period, however, must be reckoned with. Reports, which lack official confirmation, are that Russia has undertaken substantial develop-

mental work during the war and has opened many new fields. It has been the recipient of much oil field material from the United States in recent years.

With the United States virtually ruled out as a supplier in the postwar years, where will Europe obtain its oil? The best opinion is that it will come from the rapidly developing Middle East which, according to oil geologists, has promises of being one of the world's richest producing areas.

Iran is the largest producer in this section. In normal times it had an output of 75 million barrels a year, and with a potential in excess of that. The drawback has been refining capacity. In 1938 this capacity approximated 240,000 barrels a day. It has since been boosted to exceed 425,000 barrels as a move to bolster supplies for the Allied war effort. This additional capacity, in all probability, will seek a market in Europe when the war is over.

Arabia, Iraq, the Bahrein Island and Kuwait, in the Middle East, also have potential production far in excess of their pre-war levels. Moreover, refining facilities in the Bahrein Island and Arabia are being expanded by more than 100%. When completed during the present year, these facilities will be above 100,000 barrels a day against about 35,000 in 1938. Kuwait has experienced some development of production, but not any of it has as yet been shipped.

Iraq, where four nations have an oil interest — namely, Great Britain, France, Holland and the United States — also looms as an important



Venezuela, South America's leading oil producer, may become a much larger European supplier after the war

bidder for European markets when victory comes. Here plans are under way for an expansion in pipe line and refinery facilities. The oil will be brought to the eastern end of the Mediterranean and hauled by tanker from there to European markets.

Total Refining Capacity

The Middle East, thus, will have a total refining capacity of slightly less than 600,000 barrels a day against 275,000 barrels before the war. Since the pre-war demand in Europe and Great Britain amounted to about 790,000 barrels a day, excluding that of Soviet Russia, it is obvious that a sizable portion of the European market could be supplied from the Middle East.

Of South America, Venezuela has experienced the most rapid development in production of crude oil during the war. It is estimated to have a potential, within a short time, of a

million barrels a day. This would compare with actual output of a little more than 500,000 barrels daily in 1938. Since Venezuela's consumption of oil products approximates about 9 million barrels a year, or 25,000 barrels a day, its potential exportable surplus is some 975,000 barrels daily. A part of this, as in pre-war years, will find an outlet in the United States and Canada. But a much larger share is expected to be shipped to markets in Great Britain and on the European continent.

Colombia also is expected again to resume shipments of oil to Europe, but on a much smaller scale than Venezuela. In 1938 Colombia's production approximated 28 million barrels, and her internal consumption amounted to only 3.5 million barrels; so there is a potential exportable surplus of the major part of its production.

Of Mexico's production of ap-

proximately 40 million barrels a year, domestic requirements amount to about 20 million barrels, and she, too, will have an exportable surplus. Since the Mexican government for several months has had plans under consideration for expansion of its petroleum industry, the country has its eyes on foreign markets as a revenue producer. Europe, in all probability, will again be a customer.

Just how much oil Europe will require in the postwar years is a topic of speculation among oil economists. All are in fair agreement that in the immediate years of reconstruction she will not need as much oil as before the war. Meanwhile, her stocks have been severely depleted — are practically nil — because of the war and the inability to bring in new supplies. Europe's postwar demand will depend largely on the condition of her properties and the amount of destruction wrought by the war.

In 1939, consumption of oil products in Europe, including Great Britain but excluding Soviet Russia, amounted to 287.2 million barrels. Great Britain accounted for 88.6 million; Germany for 46.8 million; France for 45.2 million; Italy for 21.8 million; Rumania for 14.8 million; and Holland for 11.8 million. Other nations in that sphere consumed lesser amounts.

Immediate Postwar Needs

The Inter-Allied Committee of Postwar Requirements, a few months ago, estimated the minimum oil needs of eight Allied countries. These countries are France, Holland, Belgium (including Luxembourg), Norway, Czechoslovakia, Poland, Yugoslavia and Greece. During the first six months after their liberation, the Committee estimates these countries' oil needs at considerably less than 50% of the

amount normally used. This estimate, it should be added, allows for considerable replenishment of stocks.

Production of crude oil in the European area in 1939 amounted to only 57.7 million barrels (excluding Soviet Russia) — only a small part of consumption. This output came principally from nine countries, Albania, Austria, Czechoslovakia, France, Germany, Hungary, Italy, Poland and Rumania. Only a small amount, 9,000 barrels, came from other European nations. The Soviet's production in that year amounted to 212.5 million barrels. All of these countries have suffered destruction, in various measurement, of their properties. The extent of this damage to properties will be a factor in supplies. Can those fields contribute any sizable amounts needed in rehabilitation? If not, then most of Europe's petroleum requirements will have to come from overseas.

In addition, refinery facilities in Europe have been very substantially destroyed by bombings. A recent estimate is that 75% of these refineries have been struck. Some have been completely destroyed and are out for the duration; others may have been partly wrecked; while some of the bombings, apparently, caused only temporary shutdowns for repairs.

About 90% of the refining capacity in Rumania (which had the largest of any European nation outside of Russia), Germany, Austria, Hungary, Czechoslovakia, Italy and Yugoslavia, with a combined capacity of some 100 million barrels a year, is known to have suffered from Allied air attacks during 1944. More than 50% of Germany's synthetic plants have been bombed.

The destruction of port installations in western Europe also will be

a factor in a smaller demand, at least until reconstruction is completed. The major part of oil bunkering stations, in all probability, has been destroyed. Tank storage facilities for other products also have been blasted. These all fit into a complex demand pattern for the postwar era.

Relief and Rehabilitation

For the immediate period, moreover, it is likely that the United Nations Relief and Rehabilitation Agency (UNRRA) will handle oil supplies in reoccupied nations. A sizable quantity of needed supplies is moving from the United States for this purpose. These supplies are being utilized, however, for only vitally necessary activities, such as in the restoration of communications, utilities, transportation, agriculture and industry.

When the European war comes to an end, and reconstruction is well under way, the demand for oil products is expected to rise as Europe's rehabilitation gathers momentum. It will be several years, however, before European needs will match those in the pre-war years. Like the United States, the motor car population of Europe has experienced a decline, and many vehicles, in addition, have been destroyed by the war. The demand for motor fuel, hence, is not likely to be up to pre-

war levels for several years after the war's end.

An imponderable in the demand picture is the number of vehicles which the United Nations will use in Europe when the war ends. All of these use liquid petroleum. Undoubtedly many army trucks will be utilized for emergency purposes and they will require fuel.

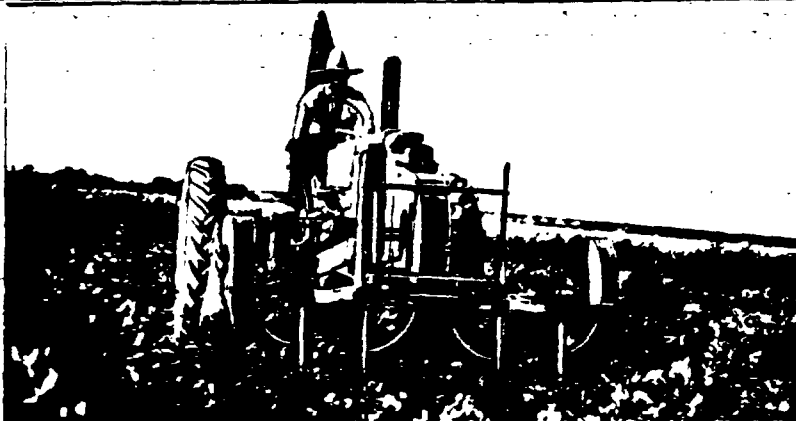
Substitute fuels used during the war, such as charcoal and gas in vehicles, and coal substitution for oil by industry, will be a factor in immediate postwar years, but of less importance. Efficiency and price of oil predicate a rapid reconversion to oil as speedily as possible.

Financial arrangements for the payment of imports, while of the utmost importance, are not expected to pose a problem. Sheer necessity for reconstruction and development of a sound economy in Europe will dictate that these be provided before all other considerations.

As in the United States, the European area, including Great Britain, uses principally motor fuel and fuel oils. In 1939, the consumption of motor fuel, excluding Russia, amounted to 124 million barrels; of fuel oils (light and heavy) 108.4 million barrels; of kerosene 18.2 million barrels; and of lubricating oils, 12.6 million barrels. Other products made up the remainder.

Fanning out from Abadan (below), the whole of the Middle East may become Europe's major postwar source of oil





A bug-blower invented by an 83-year-old farmer blows the insects off leaves, collects them in sacks



This spiked-wheel sugar beet harvester can dig, top and load 200 tons of beets in an eight-hour working day



Out of this war may come a wide expansion in power farming methods, designed especially for small farms

FARM BOOM ON WHEELS

By Stetson Clark

★ ★ ★

Because a number of engineers in the Ethyl organization are closely associated with farm machinery manufacture and development, it is necessary to point out that the statements and speculations in this article are Mr. Stetson Clark's, who is an independent farmer and a writer on farming.

A number of statements might be questioned or disproved by technical men in the tractor industry. As the purpose of this article is not technical, however — in fact, it has as great an interest for city-dwellers as for those interested in farm machinery — the editors of the Ethyl News present it to our readers just as it was written by Mr. Clark. It represents, to us, one intelligent farmer's opinion of what is happening and is about to happen to America's two-horse farms.

★ ★ ★

THE stone row is coming back in my locality. Farmers are getting the stones off their fields because power tools that travel faster than the old horse could walk, and stones, don't agree. They haven't the time to lay the stones up as walls, as the farmers of New England did before the Civil War. But they are finding the time to yank them out with tractors, and to get them to the edges of their fields.

War or no war, stones out of the way save man-hours. In my locality this is one of the clues to how agriculture is riding out the war.

But the country over, farmers have found ways and the time to squeeze out every last possible drop of work from power. Smaller farmers have licked the tractor shortage by building their own, using old automobile engines, cut-down frames and truck transmissions. Claude Wohlbach, one of my neighbors, made one last winter with which he plowed 30 acres this season. Cost of the model A engine, a Reo truck transmission and other parts he picked up at automobile

graveyards was \$35. Nut and prune growers in California are turning over the strong-man job of tree-shaker to a ratchet device that is tied with a rope to fruit- or nut-laden limbs, and operated by a power take-off from a tractor. J. B. McLaughlin, a farmer in his own right, and West Virginia Commissioner of Agriculture, has invented a new kind of soil fitter that by-passes plowing, preparing a seed bed in one operation by utilizing power-driven discs fitted with soil cutters followed by rollers, and that also applies the fertilizer, mixing it with the soil.

Overcoming the Labor Shortage

Increased use of power is making up for the shortage of farm labor. Indeed it is more than making up for it. Government estimates indicate that our farmers are now producing a third more food with about 4.5% fewer workers. But this doesn't begin to tell the story of the shortage of farm labor — because no figures are available on the shortage of competent farm help. This is the really serious problem our farmers

have had to contend with, and have licked, most of them.

Most of them who have been able to substitute power for brawn have made out, but it hasn't been as simple as this in every case. An absentee farmer I know, a New York City businessman who has a sizable dairy farm up-state, was able to do it the mechanical way. He has a herd of 40 cows. Prior to the war four men were employed some of the time, two the year around. As the help problem began to get tougher he added to his equipment, discarding units requiring two or more men to operate, in favor of the one-man type. He purchased a one-man combine, went in with a neighbor on a pick-up bailer and field-type ensilage cutter. Then he asked his best hired man, how would he like to be farm manager besides, and raised his pay accordingly. Now, this one man is running the farm single-handed. Not every farm can be mechanized to this degree. I know a New Jersey truck grower who has twice as many hands working for him as before the war, is paying them on the average

a third more per hour in wages; and worked himself into the sick bed, trying to pick up the loose ends his green help neglected.

This all goes into the picture. Machines are doing more of the work of farming than they have ever done before. But after a milking machine has got all the milk that it can, bossy has to have someone to strip her. Even a tractor calls for a driver, and someone to keep it going.

The Boom in Land Prices

Yet there is little question that most farmers are prospering. Statistics show farm buying power is up. There's a help shortage, a fertilizer shortage and a farm machinery shortage. But word comes from Tama County, Iowa that a good number of tenant farmers are buying the land that they are working. And that calls attention to another development. Tenants who are in a position to do so are buying because they think they can buy for less now than they might be able to later on. Actually farm land prices had been going up prior to the war. But they are going up faster now. Indeed some of our agricultural leaders fear that a farm land boom may be in the making, like the one that so unsettled agriculture following the last war. So far, however, prices for farm land have not gone up as fast as they did in the last war. In the last war a considerable amount of land was purchased, particularly in the corn belt, by speculative buyers. That isn't a factor of consequence this time.

This is no flamboyant uproaring boom like that of the last war. It might be called an ideological land boom, something in men's heads — also their hearts. War workers are buying farms with the idea of going onto them and working them when war jobs end. The Federal Reserve

Bank of Chicago reports that city investors are also buying farm land, but not on a speculative basis. They are buying land, not to sell, but to hold as a good investment. There's likewise evidence that many of our soldiers will want to go onto the land when they get back.

In these troublous times the land is calling us. Farm life isn't thought of so widely as it once was as going to bed with the chickens and getting up with them too and nothing but hard work in between. Fact is, it isn't like that. There's hard work, yes. But machines are taking much of the drudgery out of farming, and the general public is catching on. Take, for example, that amazing piece of transportation: the jeep. Consider not only its mechanical potency; but consider it also as part and parcel of the present ideological return to the land. The newspaper and magazine stories that appeared on what the jeep could do on a farm caught on like wild fire. The soldiers of this war no doubt still sing the old familiar ditty with the refrain "you're not behind the plow." But you can be sure few of them have literally ever been behind a plow or ever expect to be; not even the thousands who will get onto farms if they can after the war. The soldiers of this war who would like to become farmers after it is over are thinking of plowing in terms of driving a tractor with the plow following them; or maybe a jeep — or its future offspring, an all-purpose farm vehicle. Why not? Hitch it to the plow week days, saw wood and milk cows from a power take-off; then come Saturday night, off to town in it with the family to see a movie, and maybe, some evenings during the week.

The Willys Overland Company, which is making jeeps, is now planning a farm model which, among other modifications, has a reduced

gear ratio to suit it better to the heavy hauling jobs on a farm. The present military model can haul a trailer on the highway loaded with four tons of hay. The WPB permitting, the farm model may be on the market even before hostilities are concluded.

Whatever assignments it wins for itself in farm work, the jeep fits right in with the way Americans, who are farmers or want to be farmers, are now thinking. It also fits in with the general direction of the thinking of many manufacturers of agricultural equipment.

If a large-scale migration of city-dwellers to farms takes place after the war, it may well be accompanied by a wide expansion in *power farming for small farms*. Out of this war has come a new appreciation of power machinery on the farm. Out of this war, too, have come a number of new developments and improvements which promise to extend the benefits of power farming to even the smallest farms. On this basis, the postwar period may very well witness an unparalleled *farm land boom on wheels!*

Clues to the Trend

The new Massey-Harris one-man-operated self-propelled combine is a clue to the trend. Whatever else may develop, the one-family farm operated with no outside help — a market for which the Allis-Chalmers Company developed its small tractor and all-crop harvester prior to the war — will still be in the running following the war. Henry Ford's thinking might reduce many farm units to even smaller proportions.

Ford sees no reason to change his long-held conviction that many people can be part-time farmers, working some of the time in factories. The Ford Motor Company has been giving wide publicity to the idea

that following the war there ought to be a job, a piece of land and a car for everyone. Newspaper reports indicate that after the war its huge Willow Run plant may be converted into a plant for making small tractors. If such is the case, authorities say that this one plant could turn out more tractors than were made prior to the war by the entire tractor industry.

Makers of farm machinery are cautious about giving out details. But many of them seem to be thinking in terms of farming units that one man or farm family can operate, perhaps on a part-time basis. One development, that was well under way before the war, is a great increase in the popularity of small garden tractors that are even smaller than a jeep, and are of the walking rather than the riding type. Many a wage and salaried worker possessed of one of these handy little power units is taking care of an acre or so of truck crops as easily as he used to battle the weeds down with a hoe in a small garden. They can be used to mow the lawn, and have power take-offs that can be employed to spray fruit trees, paint the house, and do countless other jobs.

Speaking of hoeing, one contrivance that may be on the market following the war is a cultivator that takes dirt from the row on a conveyor, sifts out the stones and throws it over the small weeds in the rows that the cultivator shovels can't reach, thus smothering them. Hiller attachments for present cultivators, many different types of them, now also do the same job and do it pretty well. But such a device as this dirt thrower might do it much better, and in moist years when the weeds are bad might prove invaluable. It could well eliminate the need for hand hoeing of any crop under any conditions, as



Overcoming the wartime shortage, Claude Wohlbach, one of the author's neighbors, rigged up this home-made tractor

present equipment can in a great many instances.

Another possibility is a tilling device that may fit land for planting more scientifically than a plow does, followed by harrowing; also, quicker and cheaper. Further back, mention was made of an implement of this type developed by J. B. McLaughlin, West Virginia's Commissioner of Agriculture. He has also been working on the development of a new machine to do cultivating, but says that he produced such good corn this year without cultivation on land that was prepared with his "soil mixer" that he is now not sure that cultivating will be necessary with the better soil preparation that the mixer provides.

The contributions that practising farmers have made to further mechanization of agriculture during

these war years are legion. Albert M. Jongneel of Rio Vista, Cal., has developed the first successful sugar beet harvester. It digs, tops and loads 200 tons of beets in eight hours, and working a three-shift day does the work of 100 men. Alex R. Nisbet of Plainview, Texas, contributed a bug blaster while the war was on. It can be attached to a cultivating tractor, and directs a blast of air on the tops and bottoms of bug-infested leaves of row crops, and collects the bugs in sacks at the same time the crop is being cultivated. Farmers in the Green, Dane and Waushara soil conservation districts of Norman and Clay Counties in Minnesota rigged up a two-bottom plow so a crew of four men can set out trees in a shelter belt strip at the rate of 800 to 1000 an hour, four or five times as many as they could get in by hand.

A homemade level that the operator of a tractor can sight along as he drives, for the fast laying out of contour or irrigation ditches is one of the wartime contributions to farming of Washington State College. A peanut digger and shaker developed at the U. S. Department of Agriculture Laboratory at Auburn, Ga., cuts down the work of harvesting to a tenth of the normal requirement. State experiment stations have worked out all sorts of labor-savers, some of them on their own initiative and others in collaboration with farmers. So it goes.

A development similar to this took place, also, in the last war. Following it, farm machinery manufacturers provided farmers with better tractors than they had previously had, and much other new and improved equipment. But it's interesting that during this war so many mechanical contributions to working the land have come from those who are working it. As soon as economic conditions will permit manufacturers of agricultural machinery to branch out a bit, they are sure to provide the machinery on an economic mass production basis, that the farmers themselves have indicated they want by dreaming them up themselves, and in some cases, also, making them out of old automobile parts or one thing and another, and putting them to work.

It is a disquieting thought that following the last war, after a flurry of bonanza farming, the great farm depression set in, beginning with the business depression of 1920-21. Probably due to inflated land values that come with bonanza farming, the farm depression didn't lift when the business depression did. It really lasted, so many authorities hold, until 1937.

Is, then, something like this to happen to farmers following this

war? Well, war has tossed up the picture puzzle, and all anyone can report is what has happened so far. But there is one noticeable difference between this poor man's farm boom, that's rolling on wheels, and what happened in the last war. The difference can be partly described in plain arithmetic. Last war wheat sold for \$2.25 a bushel. Current quotations are \$1.50.

More Stabilized Farming

A dollar and half for a bushel of wheat isn't a bad price. With a one-man combine to harvest it a small farmer can make money growing it at that price. There were no one-man combines in the last war. That's one difference right there. The first indications were, when tractors and power farming came in, that everything would be done on a much vaster scale. The years have shown that the one-man farm, what they used to call the two-horse farm, is still in the running. Farms of this type, of perhaps twice the acreage of the old two-horse farm, according to the locality and kind of farming, are going to be a stabilizing factor, whatever develops.

A farmer of this type is not going to be anxious to sell to speculative buyers who are looking for a rise in land values — partly because he remembers what happened in the last war, and partly because he has a real attachment for his land. For there is such a thing as a human urge to keep on owning land, as well as the one our agricultural leaders are worrying about, namely, to get to own it if you don't. Even the city-dwelling investors in land this time are not trying to get rich quick. They, too, evidently are seeking no more than security.

So here it is, a land boom of a sort, rolling and rolling along; ballasted, though, with some of our most en-

during human instincts. Why indeed shouldn't it roll along the way it is going, not too fast, but steadily, right into the eight-hour day for farmers which industry has? Jeeps, small tractors, and big ones too! There are lots of ways it could be worked out. I'm primarily thinking of the stone rows in my locality, you understand; not figures.

I have a great respect for my neighbors' stone rows. True, the frost works up a few new stones to the surface where land is underlain with them. But this is work that is cementing the bond of wedlock between machines and the soil. And that union has shown what it can do in this war, and will continue to do so. You can count on that. In my immediate locality, a rocky plateau on the south bank of the Delaware, while the soil is fertile, plowland is interspersed with land only suited for pasture or woodland, and it isn't the kind you'd choose for ambitious operations in power farming. But it has its special economic value, and machines are ringing that value out of it these days. The men who are running these machines, making them themselves in many cases, are developing a way of life that they like as well as a system of agriculture. So, also, are farmers elsewhere on better land.

OUR PICTURES

Cover, Acme Newspictures, Inc. Page 3, courtesy Super Service Station; Pages 5 and 6, courtesy Esso Marketers; Page 7 (top), Ralph Pierson; Page 9, courtesy Collier's; Page 14 (top) and 17, Acme Newspictures, Inc.; Page 14 (center), Press Association, Inc.; Page 16, Wide World; Page 18 (top and center), courtesy Country Gentleman; Page 18 (bottom), courtesy Soil Conservation Service, U. S. Department of Agriculture.

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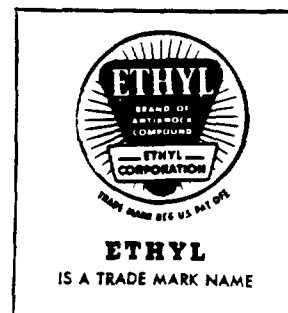
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Even the collapse of Germany can't cancel military needs for high octane gasoline. Millions of gallons will be needed to finish the Japs . . . and in the Pacific the quality, as well as the quantity, of gasoline is of tremendous importance. Higher quality gasoline gives airplanes greater range, helps them carry bigger bomb loads over vast distances, lets them stay in the air longer to patrol huge areas.

That's why practically every gallon of fighting gasoline—aviation and motor — is improved with Ethyl fluid. Military gasoline quality comes first. And that's why government agencies have limited the quality and quantity of gasoline for your car.

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



POST-WAR CARS

waiting for the Green light



The machinery for making automobiles was stopped by the red light of war...but automotive progress actually was speeded up

STRANGE AS IT SEEMS, during the very years when no civilian passenger cars were being made, automotive progress rushed ahead.

How could this happen? The answer is surprisingly simple.

An automobile is fundamentally a machine for transforming gasoline into transportation. Thus if gasoline is improved — and automobile engines utilize this improvement—then automotive progress has been made.

This is exactly what has happened

during the war years. In order to meet military requirements for high-octane gasoline, the petroleum industry has built up a tremendous high-octane capacity. With the end of the war, large quantities of high-octane components will be immediately available for general use in civilian gasoline.

When automotive engineers design

passenger car engines to utilize this improved gasoline, they will thus create *basically* better automobiles. Such cars will be far better...in *performance* and *economy* as well as in appearance.

Along with the improvement in passenger cars, you may also expect parallel progress in commercial engines. The opportunities for substantial improvement in the performance and economy of trucks and buses are as great as those for passenger cars.

ETHYL CORPORATION
Chrysler Building, New York City

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

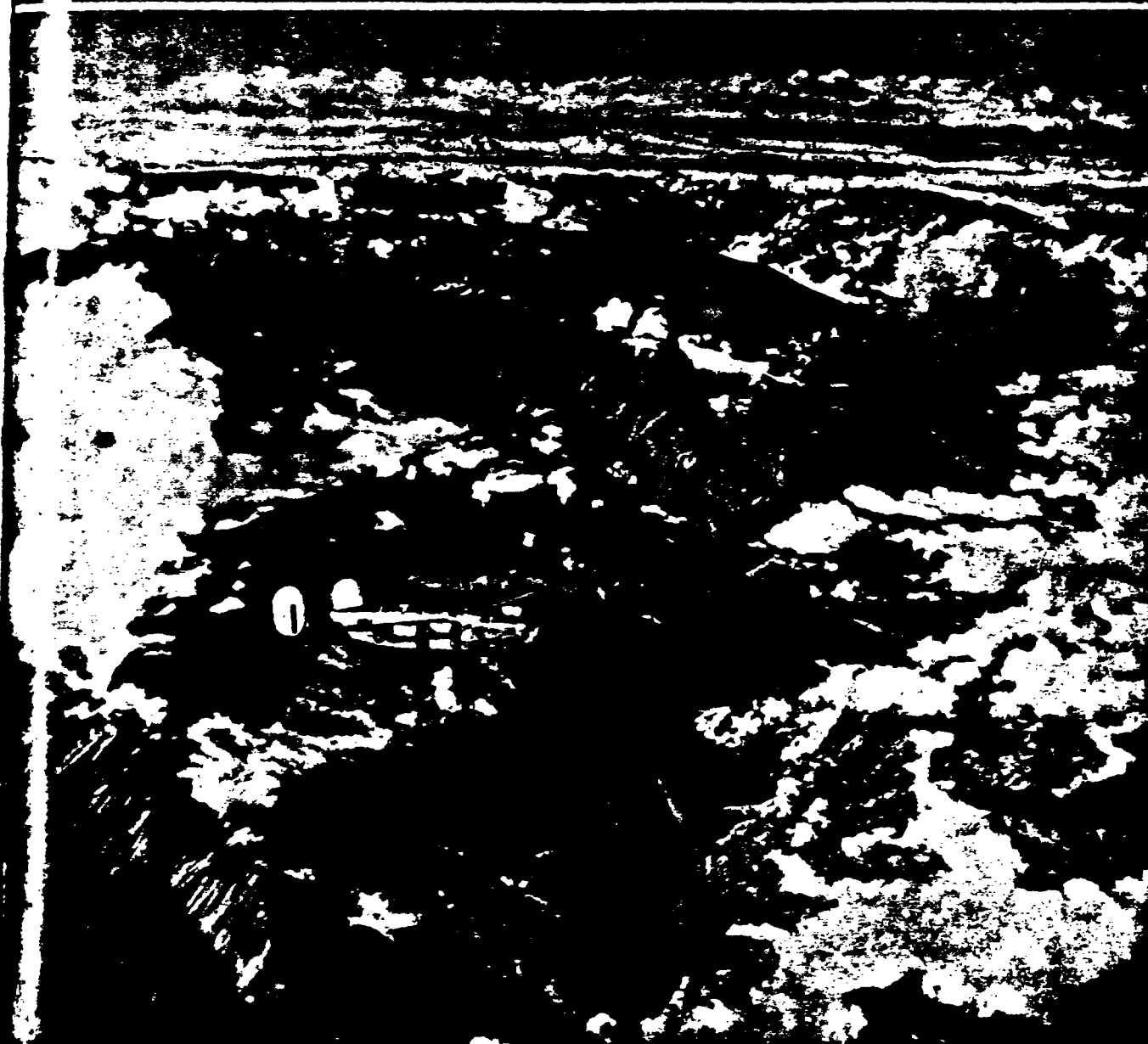


Wartime progress by America's petroleum industry has paved the way for fundamental progress in post-war automobile engine design.

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FEBRUARY 1963

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James E. Boudreau has been named advertising manager of Ethyl Corporation, following his release from the Army. While in the service he was a lieutenant colonel in the Sixth Service Command. In his new post he will be a member of the staff of Ralph C. Champlin, director of advertising and public relations.

A native of New Jersey, Colonel Boudreau attended the U. S. Military Academy at West Point and was graduated in 1925. Following a year's service, he resigned his commission to join the Munson Steamship Co. Four years later he became associated with Ethyl as a representative in eastern New York State, subsequently serving as manager of the New York and Chicago divisions respectively.

In November 1942, he was commissioned a captain in the Army, and was subsequently promoted to lieutenant colonel. At the time of his release from active duty, he was serving as director of the control division on the staff of Major General Henry S. Aurand, commanding general of the Sixth Service Command with headquarters in Chicago.

IN THE

ETHYL NEWS

FEBRUARY 1945

MIGHTY MIDGETS

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Take an eggshell of mahogany plywood, wrap it around three supermarine engines, fill it up with aviation gas — and you've got a PT: nightmarish nemesis to the Japs.

JACK MARTIN AND PHIL PERRY — IN MEMORIAM

7

SYNTHETIC REALISM

8

Amazing new devices, used to train technicians for the armed forces, duplicate actual combat conditions right in the classroom. Born of ingenuity, they provide coordinated instruction — and effect big savings in time, money and lives.

JOHN ADAMS RUNS THE NAVY

12

It's been 170 years since John Adams wrote the "Rules for the Regulation of the Navy" — but they're still the Navy's commandments. What's more, they've been the subject of a minor mystery because, until recently, they were the missing rules that ruled the Navy.

COAL TURNS ON THE HEAT

15

In the postwar race for the home heating market, coal will be a strong contender. Armed with new heating units in both the anthracite and bituminous fields, the industry is prepared for the future, promises aggressive competition to fuel oil and gas.

"SORRY, NO ETHYL"

19

Oil companies and dealers are using many sprightly ways to tell motorists why their Ethyl pumps are sometimes dry.

OIL: PACIFIC PRIZE

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Recapture of the Philippines is a prelude to the eventual recapture of the East Indies — which will one day again be a major source of oil for the East.

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

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

Earle W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzalez, secretary

1945

MIGHTY MIDGETS

By F. Richard Anderson

THE fastest and most powerful warship afloat today is an egg-shell of mahogany plywood, the PT. With not a scrap of protective armor, these fragile fighters roar in where angels might well fear to tread. In proportion to its size not even our biggest and newest battleships have so much striking power. The giant killers of our Navy are eighty feet of fighting fury armed to the gunwales with everything from tommy-guns to torpedoes. More like a torpedo bomber than a boat in many respects, they take on anything from battleships to barges, submarines to Zeros.

The expendables of 1941 are back in the Philippine waters as an indispensable part of our fleet. It was the PTs that formed the outside screen and acted as scouts during our re-

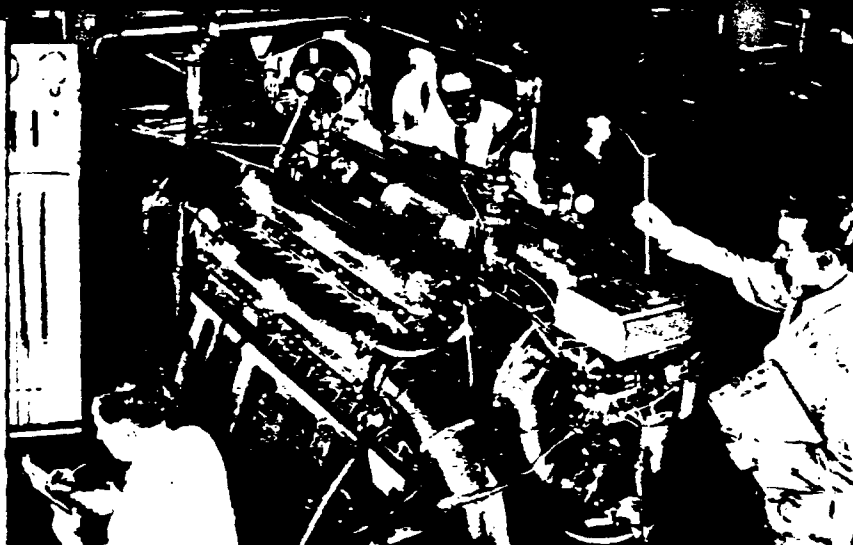
turn to the Philippines. It was the PTs that first attacked the three prongs of the Jap fleet and engaged it until our Pacific Fleet moved in to make naval history. The PTs took General MacArthur out of the Philippines and have returned with him.

The majority of these slim, sleek craft are built by the Elco Naval Division of the Electric Boat Company, Bayonne, N. J. They are eighty feet long, twenty-one feet wide and ten feet from keel to top-side. Three 1500 hp. Packard engines pack the punch that gets them in and out of the clinches. They are fighters that mount either two or four torpedoes, four mine racks or eight depth charges, a smoke screen

**The expendables of 1941 are the indispensables now
— dishing out death and destruction to the enemy**

generator, two .50 caliber machine guns and a 20 mm. cannon. Each of the two officers and eleven men who man them is a sharpshooter who likes nothing better than streaking past a Jap ship at a mile a minute spraying the decks with death and lobbing hand grenades into the Nips for good measure.

They are essentially night fighters who take over from our air arms the patrol of enemy waters from dusk to dawn. In the late afternoon squadrons of them glide out of hidden harbors with engines muffled and head for the hunting grounds — spitting trial bursts of bullets seaward. They purr on into the sunset and as night falls every man is tense with the expectancy of action. An

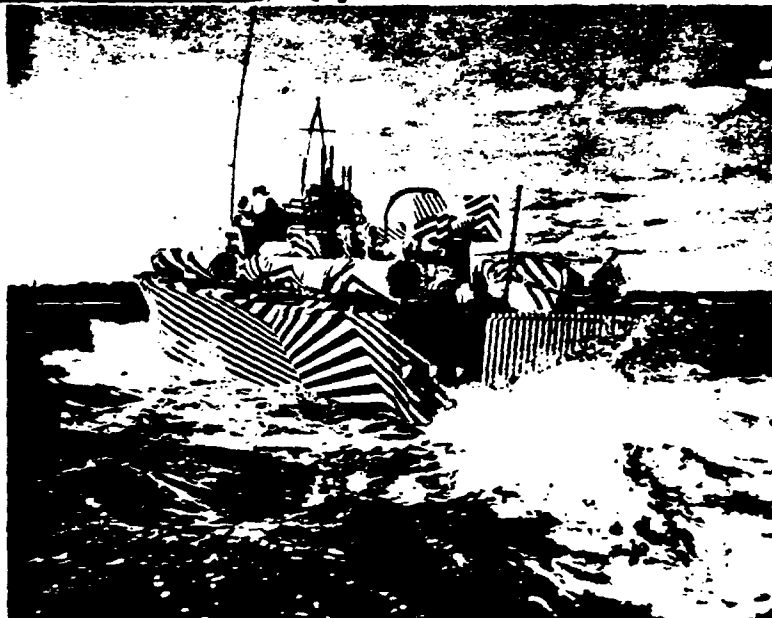


Powered by three Packard engines like this, a PT is one of the few types of surface craft which use aviation grade gasoline

enemy silhouette is sighted and before the jabbering Jap knows what's happened, the mufflers have come off and with a mighty roar and great lift of the bow the PT is moving in on wings of spray at a tremendous speed, maneuvering for the kill. The guns blaze, the skipper gets her in position and fires one, fires two, swerves and is away. Hit and run. There is an ear-splitting, blinding explosion almost in their faces, the night is ablaze. The PT wheels and comes back just to make sure.

The sea is filled with debris and Nips, screaming hysterically, as they join their ancestors.

In the early days of the Pacific warfare PTs operated under the most difficult conditions. There never seemed to be enough of anything from men to machines. They begged and borrowed gas from other branches of the service. They wore army clothes, mounted army guns and fired army ammunition. They had no adequate bases or tools with which to repair their damaged boats, which at times returned with from two to three hundred bullet holes in their wooded hulls. Men stood guard with tommy-guns over



A seagoing nightmare — to the Japs — is this PT decked out in her camouflage of zebra striping

their mates so that sharks wouldn't get them as they scraped the boat's bottom of sea slime. They operated with a few hours sleep or with none at all. Gasoline was delivered by Navy supply ships, when they could get through, in drums which had to be pushed through the surf, over coral reefs and hidden in swamps.

After the killing work of preparation under the brutal sun they roared through the night in uncharted waters, risking boats and men to stop the enemy. They ripped the bottoms out of their thin hulls

on coral reefs and the men died in shark-infested waters and in stinking swamps.

Since those heroic beginnings they have served countless times as supply ships, streaking from base to outpost with guns, ammunition, food and relief troops. They have evacuated as many as 100 Japanese prisoners on one boat. Imagine 100 little men with their protruding teeth chattering, crammed on an 80-

foot deck. PTs have covered landings by firing their 20 mm. cannon over the heads of our invading troops to silence Jap pillboxes on the shore. They are famous for their emergency rescues and have even served as taxis for admirals in a hurry.

The men are a modest crew who live a rugged life. Not all of them come back. And some who do, return with malaria, weak and ashen and never quite sure the disease will leave them free to live — and to fight — another day.

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All PT men are volunteers, but unlike other branches of the service they do not receive additional pay for their dangerous work. It is a young man's service where steady nerves and strong bodies are essential. The officers and men are trained at the "PT Annapolis," the Motor Torpedo Boat Squadron Training Center at Melville, Rhode Island. They graduate with the knowledge and physical stamina that have

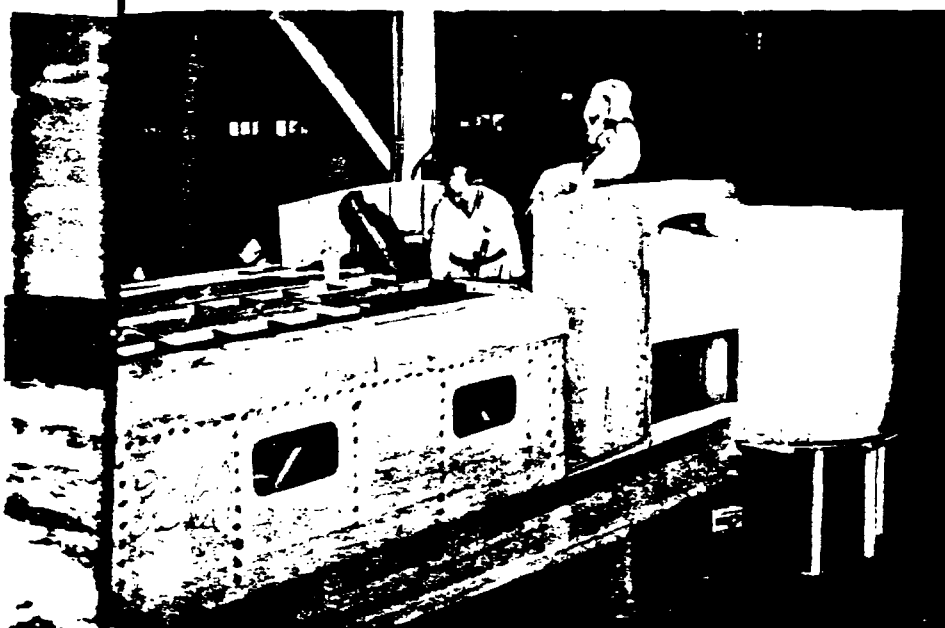
helped to make so many of them heroes.

At sea, the skipper and his executive officer each have a small stateroom, while the eleven-man crew is billeted up forward. There is a small but adequate all-electric galley; but when in combat areas all extra equipment, such as cooking utensils, is left behind, and sandwiches and thermos jugs of coffee are the basic rations.

The lethal torpedoes that will sink anything afloat are fired by electrical impulse at an angle from the boat so that the PT does not overtake them. A torpedo travels at 27 knots per hour while a PT hits twice that. The torpedoes are controlled by a gyro that can be set for any angle up to 180 degrees — which is straight back. Every time the skipper touches the torpedo firing button he is shooting ten thousand dollars, which is a drop in the bucket when you are sinking millions of dollars of Jap ships and the object of every mission is "intercept and destroy."

During combat the roar of the engines and the racket of the guns spitting orange tracers is deafening. Sometimes when a PT hits a swell at top speed all eighty feet of her glistening hull will leap out of the water and come down with a slam that shakes the men to their marrow. The boats were built to take it and the men know how to hang on for dear life.

Like planes, they attack an enemy ship again and again, making run after run until nothing is left but oil slicks and bubbles. And like planes they must have their ground crews and land bases to keep them in shape. Speed and more speed is what makes



Putting the finishing touches to the deckhouse of a PT being built at the Electric Boat Co. plant

PT boats are ideally suited to island warfare, due to their small size and extreme maneuverability





A supply of gasoline comes rolling off a landing barge at a PT base in the Pacific. A PT uses 3,000 gallons a day

their daring deeds possible, so their hulls must be as smooth and sleek as silk and their engines ready to pour on the power.

It was Comm. John D. Bulkeley, hero of the Philippines, who commanded the PTs during the invasion of France from England. Comm. Bulkeley had 18 PTs under him in the Channel with orders to hold, at all costs, one side of a five-mile-deep funnel through which we poured men and matériel. He couldn't take his boats out into the Channel in search of the inferior German E boats, but had to hold the line. He devised a roving center of two boats that tried to drive the E boats within his range, but the Germans wouldn't play. The men and boats of his command came out of those dangerous days without a single loss and were

the first warships to enter the harbor at Cherbourg.

At Guadalcanal it was the PTs that drove out the Jap escort warships and forced the enemy to give up using big troop transports and resort to barges in the attempt to bring in its men. These barges were getting by when, at the direct order of General MacArthur, a PT skipper and two of his men went ashore from their boat one night in enemy territory to see what was up. The enemy had found that there was a lull in patrols at dawn and at dusk when the PTs and planes exchanged control. The young officer and his men watched for three days and on the third night were picked up by their boat which had silently slipped near the enemy-held shore. They raced back to their base with the in-

formation which withered on the vine Jap attempts to get men into Guadalcanal.

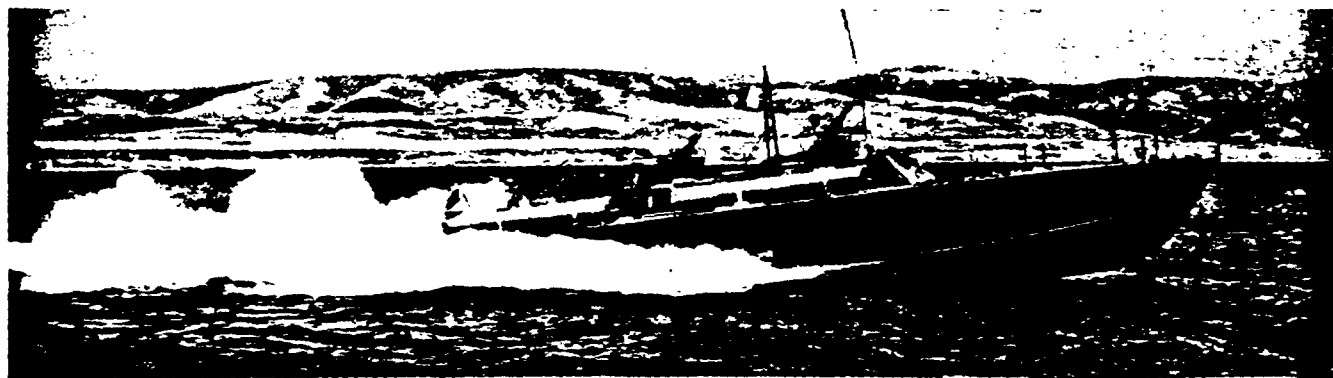
These are the type of action that get PT men citations which end with the words, "His actions were in keeping with the highest traditions of the Navy of the United States," and won for Comm. Bulkeley the Congressional Medal of Honor.

Proven Weapons

What of the future of the PT? This is the first war in which our Navy has made use of a small, high-speed boat capable of going to sea and staying there. The results have been greater than might have been expected. They are now an integral part of our Navy and will remain so. In the not too distant future we might have PT carriers much like our aircraft carriers, that would take squadrons great distances and set them down in the waters where they could operate most efficiently. They are a fine defense for our coast-line and will supplement our coastal guns.

A PT, like a dive bomber, has little prospect of becoming a pleasure craft. They cost \$400,000 apiece and burn 3,000 gallons of high-octane aviation fuel in a day's run. They are one of the few types of surface craft using aviation fuel.

They are the mighty midgets of the fleet and spearhead our attacks on the seven seas. They are the giant-killers, and tough, plenty tough. They were the expendables. They are now the indispensables.



JACK MARTIN AND PHIL PERRY KILLED IN PLANE CRASH



Philip M. Perry

ETHYL suffered a great loss when two valued members of its staff, John G. Martin and Philip M. Perry, were killed in an airplane crash, December 17, at the Memphis, Tenn. airport. At the time of their deaths, they were on an 18,000-mile tour of Army bases, at the request of the Air Transport Command, giving demonstrations and instructions to Army personnel on the proper handling of fuels.

Also killed in the crash was Captain James K. Harrison, ATC fuel officer, who in civilian life had been associated with the Standard Oil Co. of Louisiana. The pilot of the plane, Captain Buford H. Morris, and two enlisted men were injured.

The untimely deaths of Jack Martin and Phil Perry cut short the careers of two men well loved by their associates. Each was possessed of a warm personality and an enthusiasm that was infectious. As eastern regional sales manager for Ethyl, Jack had many acquaintances throughout the oil and automotive industries, and was a capable speaker and organizer. As a safety engineer, Phil Perry, too, was well known among oil refining companies.

Jack Martin had been with Ethyl for 17 years, starting as a field representative in the Middle Atlantic states and later transferring to Dallas, Texas, to supervise sales activities in Texas, Arkansas, Louisiana and Oklahoma. After serving as manager of the Tulsa division for three years, he was assigned to the New York office in 1932. A year later he went to the Los Angeles office, and in 1937 became director of the Ethyl Motor Clinics. In 1941, he was appointed eastern regional sales manager.

During the war, he took on a number of special assignments in addition to his regular duties. He contributed to the success of the war bond drives, both as a speaker and an organizer. In 1943, he spent much of his time on Ethyl's "preventive maintenance" program, designed to aid in the war-time conservation of trucks.

Jack was born in Norfolk, Va. on April 12, 1906. His father was Dr. Furman Martin, a trustee of Furman University in Greenville, S. C. He attended school in Suffolk, Va. and Florence, S. C., and was a student at both Furman University and the University of Richmond. He is survived by his wife, the former Marion Howell, his mother, Mrs. Furman Martin, two brothers, William F. and Julien Martin, and his son, John Gates, Jr., five years old.

Phil Perry was born in Boston, Mass. on March 11, 1907, and was graduated from the University of Vermont with a B. S. degree in Mechanical Engineering in 1930. After serving with the General Electric Co. for five years, he joined Ethyl as a field representative in Portland, Me. In 1942, he was assigned to the New York office as a safety engineer, and subsequently was placed in charge of tank cleaning operations.



John G. Martin

Last Fall, when Ethyl cooperated with the Army Air Corps and the Engineers Corps to give a course in "Tank Maintenance and Accident Prevention," Phil was placed in charge of the program. He travelled extensively throughout the country, giving safety demonstrations and lectures before Army personnel handling petroleum products. For this work, the Office of the Chief of Engineers, U. S. Army recently expressed its "sincere appreciation" to Ethyl.

Phil is survived by his wife, the former Miriam Lawrence, two children, Lloyd, seven, and Miriam, three, his parents, Mr. and Mrs. Frank Perry, and his brothers, Frank, Jr., William and Robert, all three of whom are serving in the Army.

Jack Martin and Phil Perry, killed in the line of duty, were casualties of the war. Their tragic deaths have saddened the hearts of their many friends and associates who had watched their promising careers develop.

We who knew Jack and Phil share with their families the comfort that in dying they gave their lives in the service of their country.



SYNTHETIC REALISM

by North Clarey, Jr.

The armed forces are saving time, money and lives through the use of ingenious, new training devices

INSIDE THE TRANSPARENT NOSE of the bomber I knelt on a little black square leather cushion and leaned over the Norden bombsight. It was like leaning out into space. Ten thousand feet below, through the rounded plastic nose section, a landscape of rivers and cities passed slowly under us.

It was cold. Under my knees the floor tingled with the vibration of the plane's four motors. Even my earphones did not shut out the muffled howl of engine and propellers that filled the compartment. Finally I saw our target, about five miles ahead, 60 degrees off to the right.

"Bomber to pilot," I said. "Target

at two o'clock — that high white bridge."

"Pilot to bomber." This in my earphones. "Roger."

The white bridge was a beautiful target, standing over a wide, dark river in a bend. Slowly the big PB4Y swung to the right until the bridge was at twelve o'clock — dead ahead — while I checked the settings I had put into the bombsight. Temperature. Air Speed. Altitude. The "trail" or lag as the bombs fall away behind the plane. The cross trail — error from side winds.

The Norden sight over which I bent was like something alive in a round black box. Tiny gyros hummed inside it. Under a round

Using moving pictures of a target, this gunnery trainer gives coordinated instruction

window on the left two little neon-lighted levels glowed. I put my face against the rubber-ringed eyepiece of the telescope; the bridge was just creeping down into the sights. Watching it, I reached back with my left hand and pulled a quadrant lever forward.

"Bomber to pilot," I said. "Bomb bay doors opening." They squealed as they slid up the side of the fuselage. I pulled another quadrant to arm the bomb-fuzes. The bridge had crept down to the horizontal cross-hair on my telescope sight; I flipped a motor switch and the 'scope began to move ever so slowly downward, following the target by itself.

"Bomber to pilot. I'll take over now."

I got his "Roger!" From then on the pilot was merely a passenger. Click — and a tiny clutch put the bombsight in control of the "auto-

matic pilot," the mechanical brain which flies the big bomber on long hops. All I had to do was keep the cross-hairs on that high white bridge, as gusts of wind or bumpy air spoiled our "aim." I kept turning my two correction control knobs as carefully as a safe-cracker opening a vault, while the target came closer to us. All of a sudden — a little click! and *dunk, dunk, dunk, dunk, dunk!* The sight had released five bombs.

"Bombs away!" I yelled in relief, and straightened up for a minute. At this altitude it would take about 45 seconds for the bombs to reach the earth. I wiped my face, counting. One, two. . . . Once more I checked the bomb-release panel above my left shoulder. Switches thrown to drop a stick of five 100-pounders — right. The intervalometer below it, set for close spacing of those five. Correct.

Forty seconds. Forty-one, two. I glued my face to the scope, saw five pin-points of white light blink on and off across the bridge and the dark river. . . .

But no puffs of smoke enveloped those little flashes. Miraculously the plane motors went silent, the panorama below stopped its motion, the humming and vibration stopped. Some one tapped me on the back: "Damn good!" I blinked and came back into this world.

"A perfect string, on your first day!" said the instructor. "You should have been an air bomber."

Down to Earth

I thanked him and got up from the little black cushion. Even with the sound effects and vibrator shut off, it still felt like being inside a real bomber until we stepped out the back. For this was a training dummy — the 7A-3 — developed by International Business Machines with engineers of the Navy's Bureau of Aeronautics, and used for training bombardiers and air bombers of the Navy, Army, and Marine Corps. How did it work?

The moving scenery below was shown on a screen from a special

projector above, which turned the panorama in any direction as the "plane" changed course. The motor and propeller noises were made by oscillators and electro-magnets. The realistic cold came from an air-conditioning unit. The bombsight was a genuine Norden, with certain features covered by tape. The 7A-3 is classified as a "synthetic" — but there's nothing synthetic about the realism, the feeling of it.

My bombing lesson was only one stop in a tour of those amazing "synthetics," a collection of which are now on exhibition in Radio City, New York. And those "synthetics" are in reality training mock-ups created by the Special Devices Division of the Navy's Bureau of Aeronautics. The devices have proven valuable beyond measure in helping the services to turn out top-flight pilots, gunners and air crewmen in a remarkably short time — and safely and economically, too. They range all the way from a three-cent cardboard "pocket blinker" that fits in

Trainees can actually see the flow of gasoline and oil through a plane by means of these transparent replicas of aircraft fuel and oil systems





A group of school children are fascinated as a sailor explains flight deck routine with this model of an Essex class carrier

your hand to a 14,000-pound "operational flight trainer" that costs a half million and requires an air-conditioned building of its own to house it.

Out of some 400 special devices, the flight engineer's control panel perhaps illustrates best the thorough-

ness, safety and economy of synthetic training. It is an actual control panel from a Martin patrol bomber, complete with 25 gauges, 77 control switches and toggles, and a galaxy of colored indicator lights — all alive and responsive. Off to one side is the large instructor's panel, with knobs

and buttons to produce the effects of wings icing up, oil pressure dropping, engine temperatures rising or falling, tanks running out of fuel, propellers getting out of pitch — all the things a flight engineer must handle, all the emergencies he has to meet.

The Story of the Edna Pat

One day not long ago, a Flying Fortress came in out of the blue, set itself down gracefully on a field . . . and set a brand new world's record. The "Edna Pat," affectionately nicknamed by its crew, had just completed 1,314 hours of flight without an engine overhaul.

The distance covered was equal to ten trips around the world. For a comparable feat, an automobile would have to travel at 60 mph for

260,000 miles, before having its cylinder head removed for the customary valve, piston ring and bearing jobs.

The engines powering this Boeing bomber are Wright Cyclone 9's, made by the Studebaker Corporation under license from Wright Aeronautical Corporation. According to Wright engineers, their uninterrupted 1,314-hour record compares with a previous best per-

formance mark, known to them, of 1,274 hours of operation.

While setting its "endurance" record, sometimes under adverse flying conditions, not one major mechanical difficulty or mishap occurred.

The Edna Pat has been used for the first, second and third phase of training for seven complete combat crews, who flew a total of 3,120,000 passenger miles in it.

Today it takes 80 hours to train a flight engineer, and the taxpayers pay \$600 an hour just to keep a Martin bomber in the air. Meanwhile eight other men in the flight crew and six in the ship's ground crew are tied up — perhaps risking death if the student makes a serious mistake. Precious high-octane gasoline is being burned. A fighting plane is being kept out of the fight. War plants are taxed to make extra aircraft (at \$500,000 each) just for training purposes.

Cuts Time and Expense

Now, a student can put in the same 80 hours right on the ground, and spend only 15 minutes in transition before he's ready to check out, fully qualified. The cost? Not \$600 an hour, but 24 cents. Does it work? Well, the newspapers and radio recently told of a PBM whose engineer got shot up. Another member of his crew, who had taken only a few hours' instruction on the trainer, took over as engineer and brought the ship safely home.

Counterparts of the ingenious devices on display at the exhibit in New York's Radio City are saving lives, time and countless sums of money in the training of combat airmen. The famous Norden bomb-sight is being "exposed" to public

view for the first time since it went off the closely guarded "secret list." The exhibit has been so popular that it has been extended until June, and plans are under way to open a similar one on the west coast.

As you walk in and look around on the main floor of the exhibit, a weird racket fills the air — the noise of planes in flight, machine and anti-aircraft guns drumming away, voices giving flight instructions over loudspeakers. Hollywood could record the racket for the sound track of its next air opus.

Above, on the gallery ahead of you, is a miniature Hayden planetarium developed for teaching celestial navigation. Stars and planets gleam overhead, moving and turning to give the student a "sight" from different parts of the world at any hour of the night.

Off to one side are displays of plane mechanisms opened up, cut away, painted and labeled for quick training of mechanics. Also an amazing device, the Gunairstructor.

You enter a dark room, climb over a wing into a cockpit, grasp the stick, and the "motors" start up. You're flying! Ahead is a panorama of sea, horizon, clouds. Bank to the right and the horizon tips the other way; push the stick forward and you dive down through big clouds while the

howl of your motor rises to a scream.

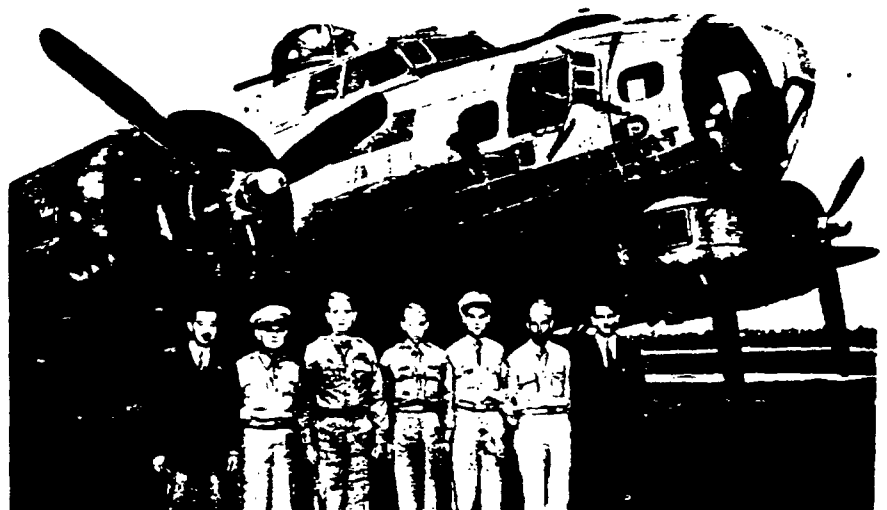
In the middle of the scene ahead of you is the white image of an enemy plane which an instructor "flies" through climbs, turns, all sorts of evasive maneuvers. You pursue him. When he's in your sights, squeeze your trigger — *bam-bam-bam!* If you hit him the tracer flashes from your gun show red. Realistic? Seasoned fliers, men with high scores in the Pacific or Europe, climb out of it after a five-minute "dog fight" mopping their faces.

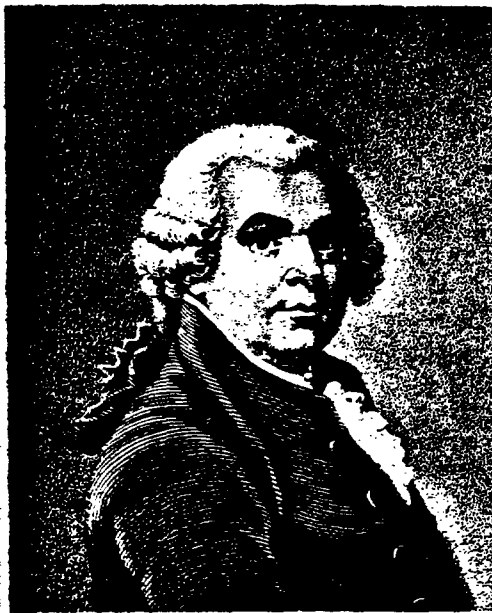
Broad Applications

Synthetic training, as exemplified by these devices, is not a new idea. Golfers drive cotton golf balls across the yard to smooth out their swing. Surgeons knot and untie bits of string in their coat pockets to keep their fingers supple. The British put it to excellent use in the early days of the war, when the Luftwaffe kept their training planes on the ground.

But never before, in warfare, has the basic principle been so widely applied as it is today. As a result, it is paying enormous dividends in the war — in time and money saved in training airmen, in numbers of trained and skilled technicians reaching the fighting fronts. If this is the case in war, what then of peacetime tomorrow?

Here with a group of officers and men at the Drew Field (Florida) AAF base is the Edna Pat, which recently set a new "endurance" record — 1,314 hours of flight without a single engine overhaul





JOHN ADAMS

John Adams RUNS THE NAVY

By John L. Thomas
Lieutenant U.S.N.R.

FOUND! THE MISSING RULES THAT RULED
THE NAVY—DRAWN UP BY OUR SECOND
PRESIDENT—LOCATED ONLY RECENTLY

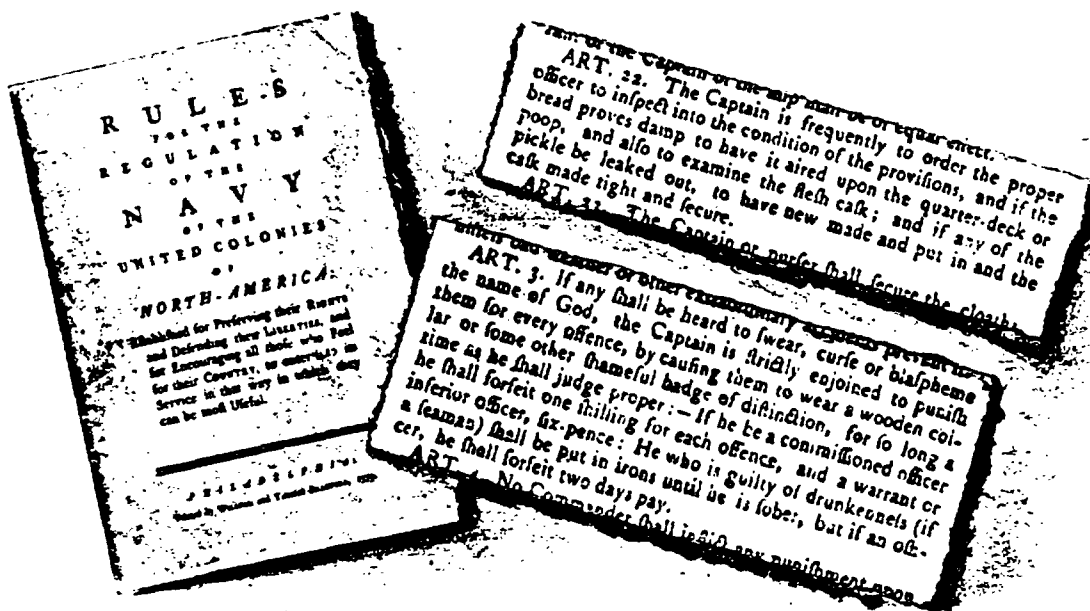
MOST OF THE 3,200,000 men and women in Uncle Sam's Navy have probably never suspected that the rights and privileges they now enjoy derive largely from a little piece of paper 170 years old—the actual whereabouts of which the Navy itself did not know until just a few months ago.

Printed in 1775, the long-missing publication is titled: *Rules for the Regulation of the Navy of the United Colonies of North-America*.

This is now recognized as the first printed document relating to the United States Navy. It is also the basis by which the service has been continuously governed for the past

170 years. Yet, if it hadn't been for a chance incident, perhaps no one would even have known it was missing!

It began with a simple inquiry that came in to the Navy Department in Washington, from a man in Philadelphia. He was working on a historical novel, about one of the first naval



*The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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captains. There was something he needed to know about an early regulation of the Navy. Could the Navy help him out?

In routine fashion, the query came to the desk of an officer in the Office of Naval Records and Library. The point was not a difficult one to solve, for early histories of the Navy contained references to the rules, and at least one reference book printed them in full.

This was, of course, second-hand information. To make sure, the officer reasoned, why not look up the original rules themselves? A reasonable enough idea — except that the longer he looked, and the more inquiries he made, the more evident it became that the Navy did not have a copy of its own original rules.

Perhaps, the officer figured, it was like the Declaration of Independence and the Constitution and other historical documents — maybe you could find them in some place like the Library of Congress.

The Library of Congress promptly reported back: No, it didn't seem to have a copy. Nor were the rules listed in its Union Catalogue, which lists the major holdings of all U.S.

libraries. Had the Navy looked in the bibliographies? These large volumes, which list the name and title of every known publication, usually tell also where at least one copy can be found.

A quick search revealed that the rules were listed — but apparently their whereabouts was a mystery, for not one bibliography told where a copy could be found.

By this time the officer's curiosity was intense. Anything that important historically couldn't just disappear into thin air. He started writing to the big libraries of the country, from New York to San Francisco. The New York Public Library reported: "No copy known." The library of the United States Naval Academy at Annapolis reported: "No copy known." The same reply came in from other big libraries.

The mystery deepening, the officer settled down to his search with a vengeance. He queried all the sort of special, semi-private libraries he knew — places like the John Carter Brown Library in Providence, and the William L. Clemens Library, places where only scholars are permitted to enter — by special permis-

sion — but which are sources of rare Americana. Again, no luck. Stranger still, none of them had any idea where a copy might possibly be found.

About this stage most of us would probably have been glad to call it a day and conclude sadly that all copies of the original rules had (a) been destroyed by fire, (b) gone down with a ship, or (c) just never existed.

The officer, however, was just getting off to a good start by now. At odd intervals during the following months, whenever he came across the name of a bookseller or dealer, he wrote him a note inquiring whether the dealer had a copy of the rules, or knew where one might perhaps be available.

Letters by the score went out, and months went by. Then one day this long shot of long shots paid out.

It was a bookseller in a back-country town in Connecticut who answered. Yes, he had had a copy. No, he didn't have it now — but he thought he knew where it was. He suggested that the officer write to Yale University Library, in New Haven; he had sold them his copy just a while ago.

THE MEN OF JOHN PAUL JONES' SHIP, THE BON HOMME RICHARD, SHOWN HERE IN HER FAMOUS BATTLE WITH THE BRITISH FRIGATE, SERAPIS, WERE AMONG THE FIRST AMERICAN SAILORS TO BE GOVERNED BY THE NAVAL RULES LAID DOWN BY JOHN ADAMS





A contemporary engraving of John Paul Jones pictured him thus, aboard a captured enemy ship

Quick inquiry to Yale developed the fact that the bookseller's lead was correct; the library did have a copy now. With Yale's permission and cooperation, photographs were made of the old pages. Line cuts were made from these, and a limited number of facsimile reprints were immediately made by the Naval Historical Foundation.

Probably the first thing you would notice on reading these early rules of the Navy is that more than half of them are concerned with the feeding, care, rights, duties and punishments of the ordinary sailor.

Commanders of all ships were "to shew in themselves a good example of honor and virtue." They were to "take care that divine services be performed twice a day on board,

and a sermon preached on Sunday, unless bad weather or other extraordinary accidents prevent."

Sailors were to be punished for swearing by the wearing of a wooden collar "or some other shameful badge of distinction," but the extreme punishment which an officer might inflict on any seaman was "twelve lashes upon his bare back, with a cat of nine tails."

Rations were fixed for each day of the week. Saturday's, for instance, consisted of "1 lb. bread, 1 lb. pork, half pint peas, and four ounces cheese." Each seaman was given a half-pint of rum a day, with a "discretionary allowance on extra duty, and in time of engagement." However, sailors were to be put in irons for drunkenness, and officers guilty

of the same offense forfeited two days' pay.

It was the captain's duty "frequently to order the proper officers to inspect the condition of the provisions, and if the bread proves damp, to have it aired upon the quarter-deck or poop."

A pay table provided that able seamen and marines were to be paid a monthly wage of \$6.67, and the captain made the top pay of \$32. A bounty of \$400 was to be deducted from the proceeds of prizes and paid to the commander, in all cases where he lost a limb in the engagement or was incapacitated from earning a livelihood; if the commander was killed, an equal amount was to be paid to his widow. Minor officers under the same circumstances received proportionately smaller sums.

These rules, which were in force throughout the Revolution, were drawn up by John Adams, who later became our second President. Their origin is largely British, Adams adapting the penal sections from "An Act . . . relating to the Government of His Majesty's Ships, Vessels, and Forces by Sea," passed by Parliament in 1749, and the rest of the rules from "Regulations and Instructions Relating to His Majesty's Service at Sea," of 1772. The U.S. code was, in general, a little less stringent.

Although it has no more than a tenuous lead to go on, the Navy believes that one other copy of these early rules exists in the country, even though it has not yet been located.

The 170 years that have elapsed since these rules were written have seen the Navy grow from a fleet of less than a half-dozen vessels to one that now numbers 56,000 ships and more than 30,000 planes. In the process, the rules that govern the Navy have expanded somewhat, too. The original version took up six pages. Today's rules run to over 700 pages.

COAL TURNS ON THE HEAT

By Wanda Jablonski

THAT a three-cornered fight for the postwar home-heating market is brewing, is obvious from the present-day plans of equipment manufacturers and dealers in the three major fuels — oil, gas and coal. But in this race, the coal industry, long regarded as a "backward" brother to the more modern fuel oil and gas heating organizations, can be expected to play a much more aggressive role than it has in the last twenty years.

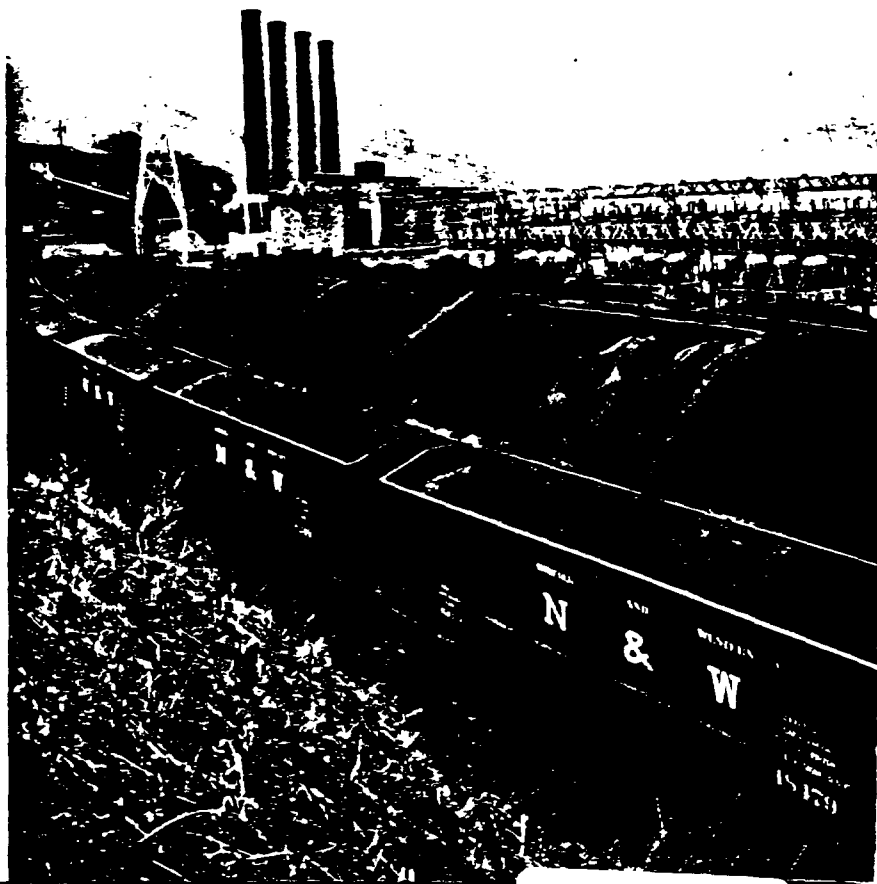
In many ways the coal industry of the postwar era will differ radically from the industry of the past. Spurred by the relative prosperity of the war years, it appears to have taken out a new lease on life.

All signs now indicate that it will be more progressive in its management, better organized, more aggressive in sales promotion, put greater emphasis on modern, automatic equipment, and lay more stress on good public relations — in short, that it may follow the pattern used so successfully by the fuel oil industry in capturing a large share of the home-heating field.

Determined never again to be elbowed out of the heating market by fuel oil and gas on such a vast scale as they were in the 1920's and 1930's, coal men have put in some hard thinking on their postwar future. They have taken stock of their position, analyzed their shortcomings and developed plans for making a

Editor's Note: When the war began, it called an abrupt halt to oil's march of progress in the home-heating field. New oil burner production was suspended. Fuel oil consumption was sharply rationed. Home owners who had been using oil were urged to convert their furnaces back to coal. In the past year, of course, the severity of these restrictions was somewhat relaxed, and the war-enforced trend to coal has probably been halted.

Meanwhile, however, the industries behind the three major heating fuels — oil, coal and gas — have been busy laying their postwar plans. They are looking ahead to the time when ample supplies are again available and normal competitive conditions prevail. Many of our readers are familiar with the postwar plans for fuel oil and oil burners — but what are oil's competitors planning? Coal, notably, has been the chief beneficiary of the wartime dislocations in the home-heating field. Thus, believing that a report on the coal industry's postwar planning would be of interest, the following article is presented.



strong bid for a larger slice of the postwar market.

Three major developments have taken place in the solid fuel industry in the last few years which promise to have an important postwar effect:

(1) It has developed revolutionary innovations in heating equipment — both for anthracite and bituminous coal — which it claims will approach, or equal, oil and gas equipment in convenience and compactness at lower heating cost.

(2) It has become better organized.

(3) It has laid plans for new methods of sales promotion, many of which are the first of their kind in the coal industry.

New Blood in the Industry

Perhaps the most far-reaching change that has occurred in the coal industry, however, is a more fundamental one and lies at the root of its brighter postwar outlook. This is the change that has been taking place slowly but surely in its management with the influx of younger blood.

Many of the older executives who were in control when coal still had a virtual monopoly of the heating market in the earlier 1920's, and who have long been criticized for lack of cooperation and for not adapting themselves to changed, competitive conditions, have now been succeeded by sons and younger men in their organizations.

For all practical purposes, the coal industry enjoyed a monopoly of the heating market up to about 1926. This did not provide much incentive for improving equipment, marketing or cooperation, and it has been stated that the industry made little progress along these lines during the last century.

With the arrival of aggressive fuel

oil and gas sales organizations on the field, coal was unprepared for such competition, and sales went down rapidly. From 1926 to 1938, for example, the tonnage of anthracite shipped by rail fell from 67,000,000 tons to 35,400,000, even though the country's population increased. Faced with a bleak future, a spirit of defeatism pervaded the industry.

Now, however, many younger men have won their spurs in the lean years, have tasted prosperity and the effectiveness of industry cooperation during the war, and have recently attained positions of top management. They are planning the industry's future from a fresh viewpoint and are quietly effecting a revolution in its policies.

Realizing that coal must be prepared to offer the convenience of modern oil and gas installations if it is to hold its own, the industry has spent considerable money the last few years on a comprehensive research program.

Almost overnight, far-reaching, revolutionary innovations in heating equipment have been produced. As a result, the coal industry is now prepared to put fully automatic, more efficient and smokeless equipment on the postwar market.

Perhaps the most revolutionary of all developments in coal history is a new principle of anthracite combustion developed by Anthracite Industries, Inc., and turned over to equipment manufacturers last August.

Utilization of this principle will make it possible to produce an automatic central heating furnace measuring 2 by 2 by 3 feet, suitable for heating the average-size home. Weighing only about 75 pounds, it will surpass the efficiency of the large 1,000-pound present-day furnaces.

Basically, the new principle of combustion is almost a complete

reversal of that currently utilized in anthracite-burning equipment. It substitutes a concentrated, fast-burning fire of great intensity in a miniature firebox measuring 6 or 8 inches by 18 inches, in place of the present method of burning a large body of anthracite slowly in a large firebox.

As a result, the burning rate of coal is increased more than 5 times, heat liberation per pound of coal is raised about 10 times, heat absorption is increased 7 to 8 times, while coal consumption is decreased materially.

Known as "Anthratube," the mechanism for applying the new principle looks more like an ordinary kitchen meat grinder than the traditional concept of a furnace. It consists simply of a hollow tube 6 or 8 inches in diameter and 18 inches long. The coal is fed automatically into one end of the tube by a revolving worm directly from the bin, it burns in the center of the tube, and the ash is discharged automatically at the other end into an enclosed container or a pit outside the house.

Versatile Unit

Effective with either hot water, steam or warm air systems, the water or air is circulated around the hot part of the tube in a small jacket and carried throughout the house in the same manner in which it is distributed by present-day heating systems. Draft is provided by air which enters at the ash end of the tube and is drawn through the incoming coal by an induced draft fan in the smoke pipe.

All complicated flue passes or secondary heat-absorbing surfaces have been eliminated, as it was found that anthracite, composed of almost pure carbon, can be made to burn to complete combustion within its own area without the necessity for

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secondary air or combustion spaces. The efficiency of the unit is further heightened by the fact that the coal does not clinker.

This new development, the anthracite industry maintains, will offer the following advantages to consumers:

(1) Considerably lower installation cost than any automatic equipment now in use for any other domestic fuel.

(2) Greater efficiency and smaller coal consumption than with current anthracite units, and possibly the lowest operating cost of any heating unit now in use in the anthracite market area.

(3) Enormous reduction in size and weight of the firebox, saving space and eliminating the necessity of a basement.

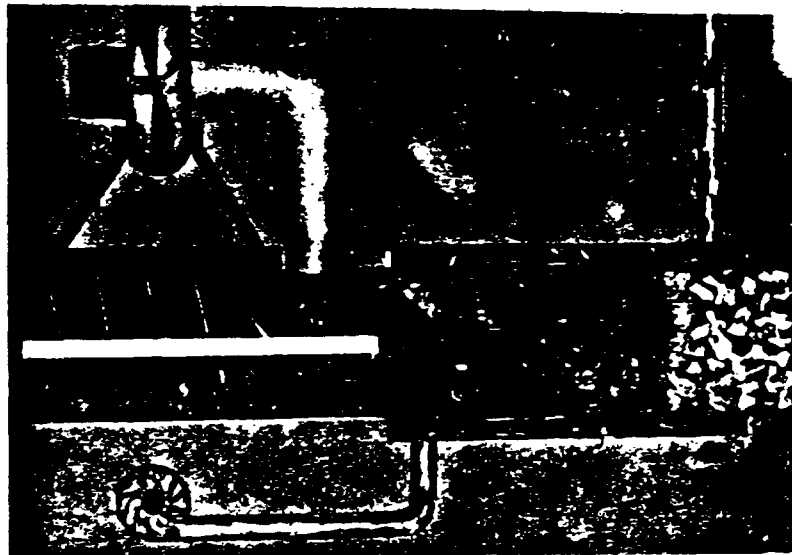
The industry believes that this development will give it a great competitive weapon it has never had before and will play an important role in expanding the anthracite market in the postwar era.

Since it represents a principle of combustion rather than of equipment design, it is believed that the flexibility of its application is practically unlimited. Many engineers even maintain the new principle has possibilities of revolutionizing the entire hard coal combustion field in the future.

Not to be outdone, the bituminous coal industry has also come forward with a new principle of soft coal combustion, ready for incorporation into new postwar heating units.

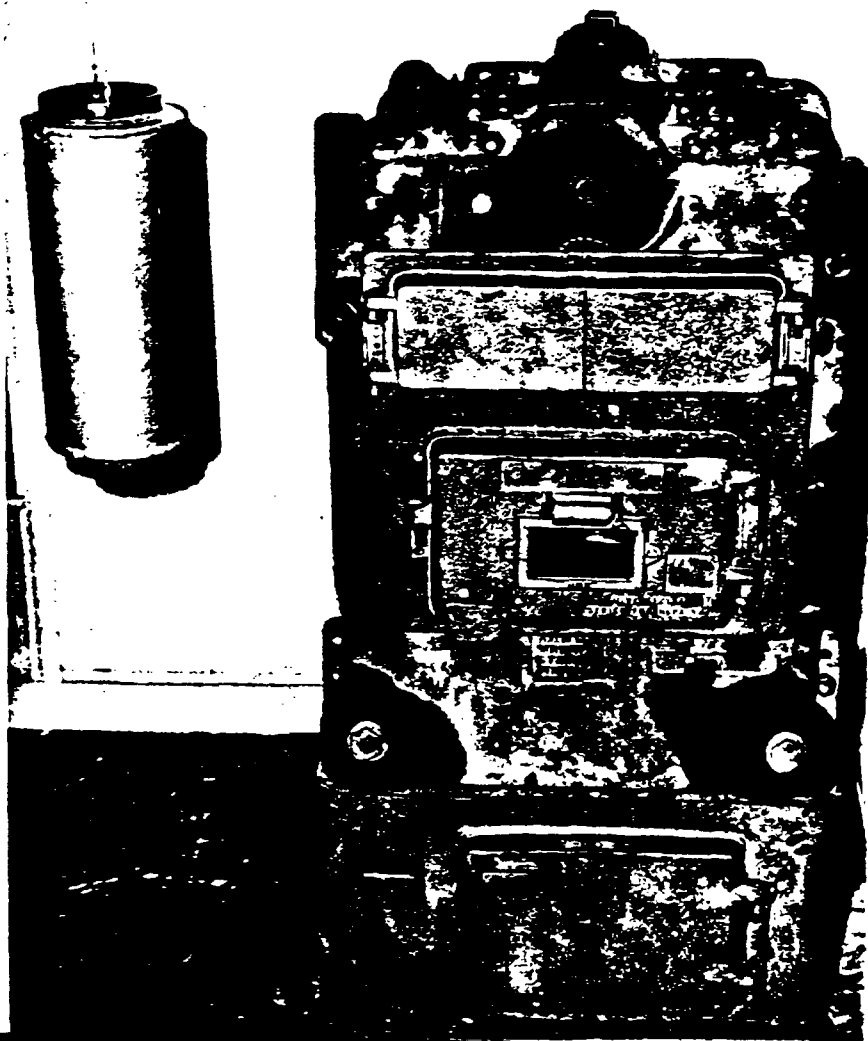
This new principle "eats up" the gases and smoke from soft coal, thus not only eliminating most of the smoke but also effectively recovering a much higher percentage of the heat value of the coal.

One application, a magazine stove for heating the average four- or five-



A schematic design of the Anthratube shows how the coal is automatically forced through the tube by a worm gear, burned to complete combustion, and the ash passed out

Below, left, is the new anthracite unit (shown schematically above) compared with a present-day furnace. Its new principle of combustion makes it vastly more compact



room house, has already been designed and tested, and will sell for less than \$100.

The first major improvement in coal stove design since Benjamin Franklin made his historical contribution to the art of home heating over 200 years ago, the stove has a capacity of 100 pounds.

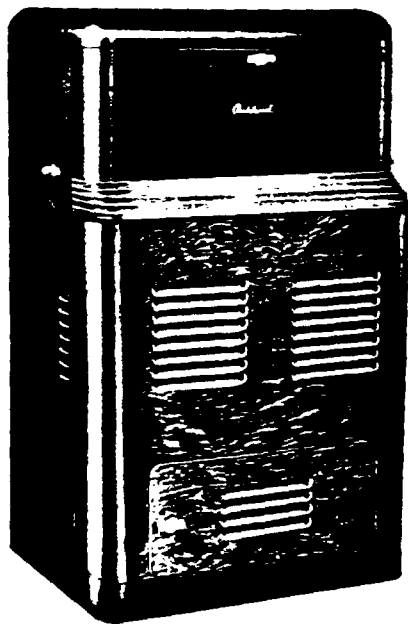
Such new magazine stoves and furnaces will be the soft coal industry's primary bid for the new home-heating field. Among the advantages claimed for these units are: a fuel cost lower than that of oil or gas, steadier heat, and complete smokelessness.

New Automatic Stokers

New types of bituminous coal stokers which come under the classification of "fully automatic" have also been developed recently for burning a wide variety of coals.

It is believed, however, that most of the stoker companies will probably concentrate on selling both

Bituminous coal's postwar heating units, of which this is one, will be smokeless, economical, efficient



these and the hopper models primarily for conversions from hand-fired coal equipment or from oil and gas-burners, rather than go in for building complete boiler and stoker units for new homes. The latter are still considered too expensive to offer much competition to oil and gas furnaces.

The second important development which has taken place recently in the coal industry is a marked trend toward trade cooperation and organization.

The experience of the war years has clearly demonstrated to coal men the value of industry organization for improving their position, and postwar plans now call for continuing and strengthening the associations formed during the war.

For example, dealer associations in the New England and Middle Atlantic States were organized for the first time just prior to the war into one association, the Eastern States Solid Fuels Conference, for the purpose of presenting a united front to Governmental agencies. This has been found so mutually beneficial that the organization will no doubt be continued.

In addition, the American Retail Coal Association, representing mid-western dealers, has been considerably strengthened and expanded, while individual state dealer associations have also been invigorated. To cite only one case, the Fuel Merchants Association of New Jersey, which prior to the war represented not more than 30 to 40 per cent of the dealers in that state, now has a membership of practically 100 per cent.

Plans for improved sales promotion in the postwar period have also been made. These include extensive programs by many leading producing companies for expanding sales through better dealer education and

servicing, as well as through advertising and continued research on new equipment.

Dealers, for their part, are portraying great interest in the new heating equipment and many are planning to go in for selling stokers and the new "Anthratube" units after the war.

New Accent on Service

Recently, too, they have become much more "servicing"-conscious, and have been very active in promoting the sale of heat thermostats to their customers. Some have also adopted the "degree-day" system used by fuel oil men in keeping consumers adequately supplied with fuel, though on the whole, this method does not adapt itself as readily to coal as to oil, since consumption in hand-fired coal units is not automatically controlled.

Another new development has been the formation of a company to sell automatic anthracite equipment and to provide complete firing and maintenance service — on a daily, weekly, or any other time basis.

The first of its kind in the coal industry, the project was set up by a group of hard coal producers to promote maximum consumer satisfaction and enlarge the industry's postwar market. Methods of operation are determined from the dealer viewpoint and developed in consultation with local retail dealers.

About 3,000 families in three states are already included in its rapidly growing account, and the organization plans to expand throughout the entire anthracite market area after the war. When manufacturing restrictions are lifted, a drive will also be launched to introduce modern, automatic, thermostatically controlled anthracite equipment throughout the Northeast and Middle Atlantic area.

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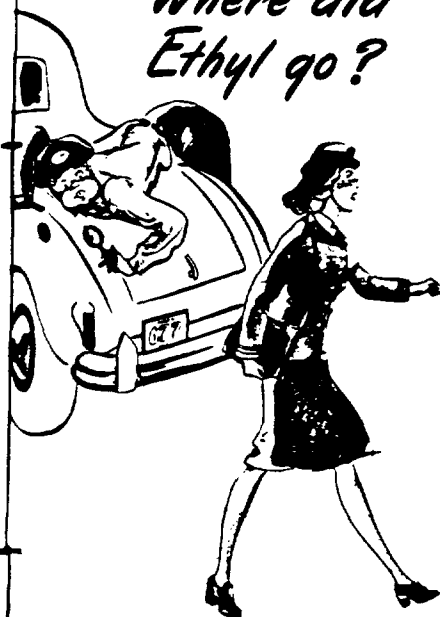
THERE may be a dearth of Ethyl gasoline for civilians—but there is no limit to the ingenuity being used to explain the shortage to the public. Any number of oil companies and dealers have found many sprightly ways to tell motorists why their Ethyl pumps are sometimes dry.

Following the drastic cut in civilian supplies last Fall (which has since been somewhat eased), a number of service stations in St. Louis blossomed forth with this sign painted on their windows: "ETHYL HAS GONE TO WAR." "Ethyl is a WAC" — "Ethyl is a WAVE," other station placards explained. But for motorists who came to call at one station in New Jersey, a simple sign informed them, "Ethyl is out."

In a brightly written pamphlet, the Aetna Oil Co., of Louisville, Ky., asks, "Where did Ethyl go?" — and then goes on to explain, "Why — Ethyl's gone to war."

"Of course it's hard for you to find that gasoline gal called Ethyl," the message declares. "She's vitally needed at the war front to help power the attack!"

*Where did
Ethyl go?*



"You're hearing about her now . . . for Ethyl is sky-high in Super-Fortresses, Liberators, Mitchells and many fighter planes! She's also doing her bit in tanks, jeeps, army trucks, etc., and you'll find her aboard P-T Boats, Destroyers, Battleships, etc. In fact, she's everywhere that super-powerful gasoline is a wartime must!"

"But . . . don't be jealous! She'll be back after the war . . . and, in the meantime, remember her kid sister, Aetna Regular? Well, she's grown-up now . . . has plenty of zip and go! So — put *her* in your car. You'll not only like Ethyl's kid sister, but you'll get a *real* kick out of her! Just ask any Aetna representative to introduce you!"

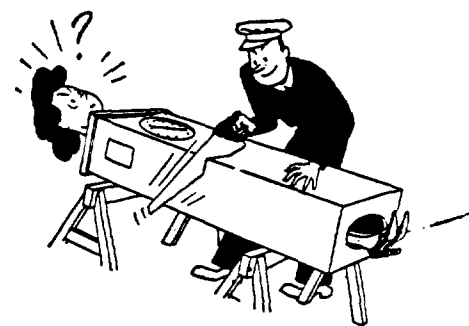
Using a cartoon-takeoff of a man sawing a woman in half, the *Cincinnati Enquirer* told its readers thusly why some service stations are offering their customers half Ethyl-half regular gasoline:

"Cutting Ethyl in half is not just a perverse whim of your filling station man. The high-test stuff is flying high over Germany just now. There's not much left for his tank — or yours. So when he asks his Ethyl customers to please take half-and-half (half regular, half Ethyl), he's just making sure everyone gets his share . . . and that there'll be some Ethyl left for you next time you drive in."

The Power of Faith

Then there's the story of a former minister, now a counsellor on church budgets, who *was* able to get a tankful of Ethyl. Stopping at a service station one day, he had been told, as before, "Sorry, no Ethyl." Just then, the clergyman opened the luggage compartment of his car, to test the air in his spare tire, when the station attendant spied a copy of the Bible inside.

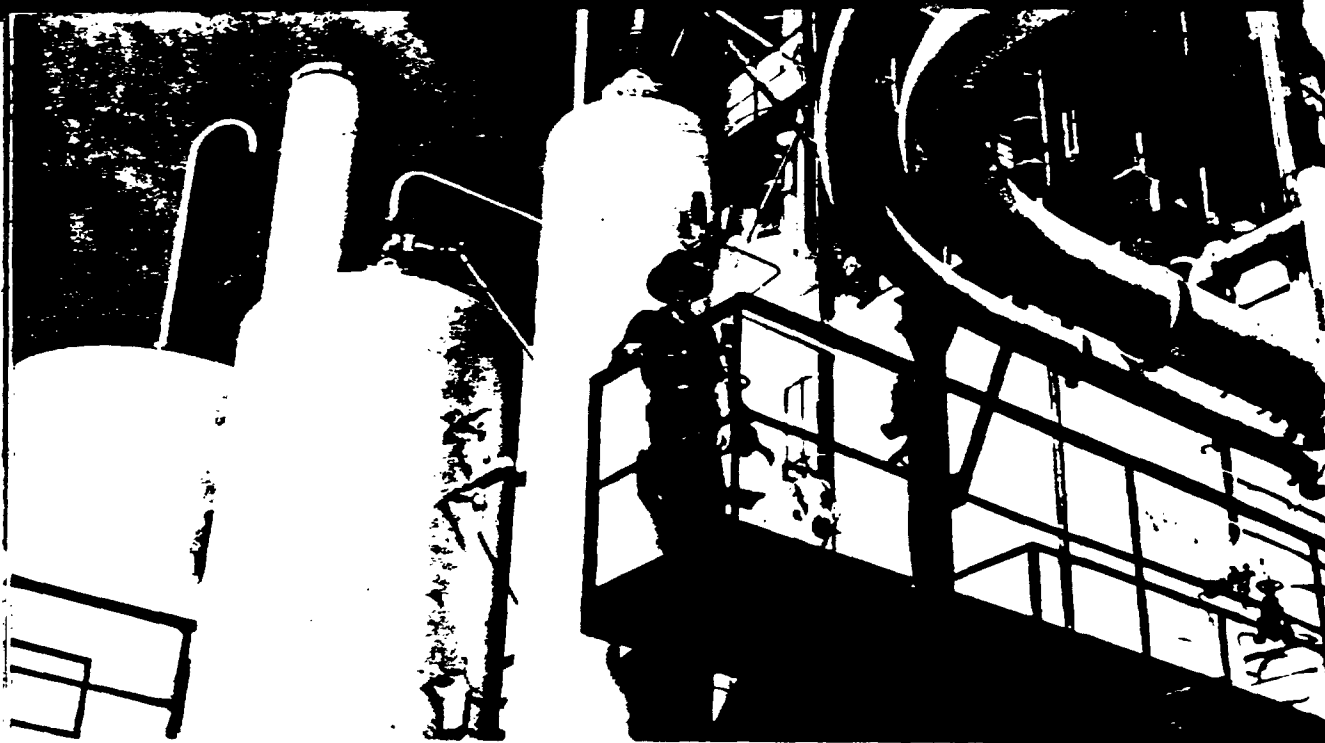
"Do you go to church?" the attendant asked. Informed that his customer was a clergyman, the at-



CUTTING "ETHYL" IN HALF

tendant then said, "Just wait until these other fellows are gone and I will fill your tank with Ethyl."

Said the minister, summing it all up: "The Bible has been an invaluable aid to me all through life, but this is the first time it ever filled my gas tank with Ethyl."



A Netherlands East Indies cracking plant — before the war. Destruction and damage inflicted on East Indies oil installations will require a vast job of reconstruction

The comparative accessibility of the East Indies, the fact that Japan had included them in her grandiose "Co-Prosperity Sphere" and their proved ability to supply oil in more than ample quantity for a war of long duration, made them a prime objective. The Japanese struck first at Brunei and Sarawak, British protectorates in northwest Borneo, where the Seria and Miri fields are located. Their next blow was directed at very valuable Tarakan off the east coast of Dutch Borneo.

Moving down the eastern shores of Borneo, the Japs then took the more highly productive Samarinda and Balikpapan fields and later engulfed Sumatra, richest of the Indies in oil and with fields stretching from Palembang in the southeast to Pangkalan Brandan in the northwest. Subsequently Java, Ceram and New Guinea, all with proved or prospective fields, also fell.

The Japs did not acquire the fields and adjacent refineries intact, because many of the oil installations

had been damaged or destroyed before they could be taken.

Facilities which remained undamaged and those that have been rebuilt by the invaders will probably be destroyed by the Japanese themselves when they evacuate the islands. Another destructive force that has attacked these installations is the U. S. Army Air Corps, whose long-range bombers have struck several times at Balikpapan and Palembang. At any rate, these various forces will require the construction of much new refining capacity after the war.

The other need, that for new reserves, will be filled by the exploration program interrupted by the war. This program will undoubtedly be renewed with increased vigor, when conditions permit, for the markets which the East Indies supplied in the past will require more oil in the future. Exploration elsewhere in the South Pacific, notably on New Zealand, has been unsuccessful, so that the Indies seem to have a tight grasp on the oil supply

situation of the Far East. Extensive development will be necessary to retain that grasp, and with so much promising territory available and with ample markets assured, such development certainly will be undertaken.

OUR PICTURES . . .

Cover, courtesy U. S. Army Air Forces. Pages 3, 5 (bottom), 6 (top) and 8-10, Official U. S. Navy Photographs; Page 4 (top), courtesy Packard Motor Car Co.; Pages 4 (center), 5 (center) and 6 (bottom), courtesy Elco Naval Division, Electric Boat Co.; Page 11, courtesy Wright Aeronautical Corp.; Page 12, New York Public Library; Page 13, Naval History Society Library; Page 14, C. W. Drepperd Collection; Pages 15 and 18, courtesy Bituminous Coal Institute; Page 17, courtesy Anthracite Industries, Inc.; Page 20, U. S. Army Air Forces photo through Acme Newspictures, Inc.; Page 21, Sovfoto; Page 22, British Combine; Third Cover, Philip D. Gendreau.

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"... It is for us, the living, rather, to be dedicated here to the unfinished work which they who fought here thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us—that from these honored dead we take increased devotion to the cause for which they gave the last full measure of devotion—that we here highly resolve that these dead shall not have died in vain—that this nation, under God, shall have a new birth of freedom and that Government of the people, by the people, for the people, shall not perish from the earth."



By LAND, SEA, and AIR, millions of gallons of high-octane gasoline are going to our fighting men.

The fighting gasoline our armed forces are getting today is better gasoline than anything ever offered to car owners in pre-war years. From both quantity and quality standpoints, it represents the best part of the American petroleum indus-

try's production—plus most of the Ethyl fluid being manufactured.

But some fine day the Army and Navy will say it's safe to cut back on military production. Then it will be your turn to get all the Ethyl you want and better Ethyl than ever before . . . gasoline that will bring out the best performance of any car—pre-war or post-war.



ETHYL
CORPORATION

Chrysler Building, New York, N. Y.

ETHYL NEWS



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MARCH ★ 1945

ETC 32037



IN THE

ETHYL NEWS

MARCH 1941

Lt. Commander Raymond H. Luke, formerly of Ethyl's Atlanta Division, has been awarded a Bronze Star for meritorious service during the European invasion.

The medal was bestowed for his work as executive officer of a Naval Amphibious Base in England. In presenting the award, Commander C. Z. Crane, U.S.N.R., said:

"In the name of the President of the United States of America, it gives me great pleasure to award this Bronze Star to Lt. Commander R. H. Luke, for Meritorious Service, as Executive Officer of his base, in preparing facilities of a Naval Amphibious Base on the English Channel coast for its part in the invasion of France, despite damage to his ships and docks by enemy bombing raids before D-Day."

A graduate of Annapolis, class of 1925, Commander Luke joined Ethyl Corporation in 1941. Shortly after Pearl Harbor he was commissioned a Lieutenant (SG) in the Navy and was stationed in New Orleans. Following a tour of duty in Panama City, where he was commanding officer of the base, he was sent to England where he established several bases as executive and commanding officer. Last year he was promoted to the rank of Lieutenant Commander.

INNOCENTS ABROAD

3

In the last war, American servicemen had only a crude vocabulary of foreign languages — but this time they can handle themselves in 23 native tongues . . . even pidgin English. All this is due to an ingenious series of pocket guides and foreign language dictionaries, prepared by the War and Navy Departments.

R. FOR SERVICE

8

Clifford Patton is a man who believes in getting dependable performance from his motorized equipment. Take his stationary gasoline engine, in operation now for 45 years. . . .

THEY'LL SAIL AGAIN

10

The launching of new ships is only one of the production records set by American shipyards. Equally impressive is the number of damaged ships repaired — and sent back into battle. Behind it all is a miracle in ship surgery, a miracle that began at Pearl Harbor.

BITE 'EM BACK!

15

Insects have killed more men than all the wars in history put together. That's why an all-out campaign, as determined as the fight against the Axis, has been launched against plague and pestilence.

HIGH ROAD TO CHINA

18

The new Ledo Road, triumph in gasoline and guts, is the second of three new transportation arteries to China blasted open during the war. And besides its other advantages, it will now bring the cost of shipping oil to China down to earth.

DEATH MADE SAFE

20

Every bomb has an ingenious device to set it off — and wreak a special kind of destruction on the enemy. But equally ingenious are other parts of the bomb — which prevent a premature explosion. That's why even direct ack-ack hits, for example, won't set off a bomb until it reaches its target.

VIDEO AFTER V-DAY

23

The war may have temporarily stunted its growth, but television looks ahead to a bright postwar future. And here's a report of what is in store, based upon current trends.

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

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

Barlo W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzalez, secretary

ETC 32038

1945



Innocents Abroad

Whether it's "Lokanta nerede?"* or "Hoeveel kost dit?"**
 GI Joe knows the answer — in 23 different languages

It won't be the fault of the War and Navy Departments if the 5,000,000 and more men now on overseas duty are not goodwill ambassadors for America wherever they may light.

As far back as the days when the first contingents of American troops were assigned to Great Britain and Northern Ireland, the problem of how to help G.I. Joe win friends and influence people abroad became a prime concern of the Army and Navy.

To "brief" our young men for their overseas missions, Washington went Baedeker by producing a series of guide books to countries on the assignment list and then sup-

plemented this service by arranging to teach them foreign languages in from one to any given number of easy lessons.

Our friends in foreign countries may laugh when our boys in uniform sit down to rattle off simple if not intricate phrases in the language of the realm. They may be amused over some of the clumsy attempts of our troops to adjust themselves to native customs. They may be annoyed if our servicemen show more interest than restraint in the strange manners and clothing of a nation's people.

But no one can blame the War Department in Washington for not trying to teach the Yank emissaries

*Turkish: "Where is a restaurant?"
 **Dutch: "How much does this cost?"



how to make new friends and influence them to the idea that Americans as a general rule are not 100% scoundrels and braggarts.

Twenty-eight guide books have been issued so far in the series, including books on Hawaii and Alaska. As handmaidens to the pocket guides, the War Department has produced 23 books of instruc-

tion on foreign languages, including pidgin English.

You can take the whole set of guide books and fit them into the pattern of America's part, step by step, in the war. First to come off the presses was a guide book to Great Britain, and then, in order, came books on Northern Ireland, Australia, North Africa, and China. From that point on the series was expanded to include guides to Iraq, Iran, West Africa, Egypt, India, Syria, Burma, New Zealand, Italy, Panama, New Guinea, New Caledonia, Netherlands East Indies, Russia, France, Denmark, Belgium, Luxembourg, and Norway.

Straight from the Shoulder

The trooper who carefully reads his guide book before entering a foreign country is "exposed" to some clear-cut reasons for his assignment, and handed some straight-

from-the-shoulder talk on why his conduct abroad is vital to American prestige.

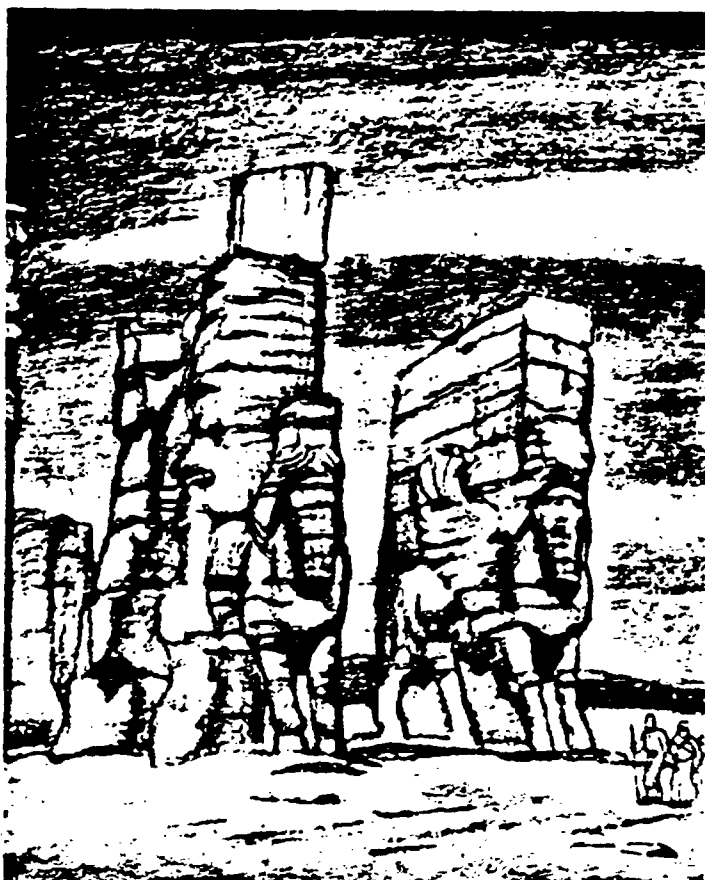
The soldier sent to Iran, for instance, is told this:

"Because of its prime strategic value, Iran is the only country in the world where the armies of three of the United Nations — Great Britain, Russia and the United States — are operating in daily touch with each other. This combination of great powers, cooperating in the defense of Iran, is a clear-cut indication of the decisive importance of the task you and your outfit have been called upon to do.

"You, as an American, have a responsibility that goes beyond the ordinary military duties required of you. Your country has a reputation throughout the world for decency and unselfishness in its dealings with other nations. That reputation is a major asset for us in this global war. By your actions you can uphold it or destroy it. Accordingly, it is part of your job to establish and maintain friendly relations with the soldiers of our Allies — Russia and Great Britain — and with the people of Iran. Most of those you meet won't know very much about Americans except by reputation. They will watch to see how you act and what you do and probably say to themselves: 'So, this is what Americans are like.' And what they think of us will have much to do with our military success or failure."

Not much mincing of words there for G. I. Joe in Iran.

Each of the guide books is a marvel of compactness and clarity. In 48 pages, for example, the guide to Syria covers the history of this ancient holy land, describes its important cities, tells about the people (how they act and live), discusses the climate and sanitary conditions, explains the nation's currency,



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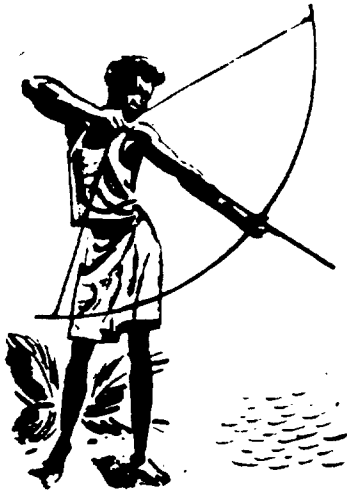
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weights and measures, and even takes up the Arabic language by giving hints on pronunciation, as well as translations of useful words and phrases. An important section



in each guide book is a glossary of words and phrases.

Language in the guides is earthy — simple and plain enough for any soldier or sailor or marine to understand without recourse to a dictionary of two-dollar words. Even in the guide book to Great Britain, the first in the series and a bit more restrained than its successors, there is sound advice that pulls no punches:

"Don't be a show-off. The British dislike bragging and showing off. American wages and American soldiers' pay are the highest in the world. When pay day comes, it would be sound practice to learn to spend your money according to British standards. . . . They won't

think any better of you for throwing money around . . . The British 'Tommy' is apt to be especially touchy about the difference between his wages and yours. Keep this in mind. Use common sense and don't rub him the wrong way."

The bright young men who wrote the guide book on New Caledonia used the tricks of a Chamber of Commerce publicist to "sell" this interesting and little-known country to the visiting servicemen. And, incidentally, the claim is made that it is the first guide book of any kind ever published to inform Americans on New Caledonia.

"This island of the Free French," the book points out, "has been the home of Frenchmen for more than a century, but few Americans have been there, and few know anything

Pacific lifeline which joins our strength with Australia and with the Dutch who still give battle to the enemy in some of the islands of the East Indies.

"You are fortunate that this island is to be your station for the time being. New Caledonia is the only island in the western South Seas which is wholly free of fever."

How to be a good listener was the advice given to the soldier assigned to Northern Ireland:

"They may expect you to brag about New York's big buildings. Don't do it. . . . There are Irishmen who emigrated to the United States as boys and who have returned, near the end of their lives, to the little villages they left long ago. Some of them are unpopular because they talk about skyscrapers, express high-

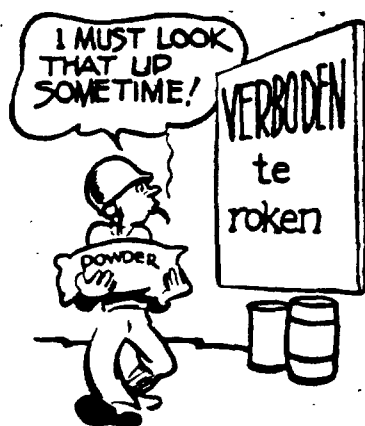


about it. . . . The position of this island is of great importance to the security of our country. To win the war, we must keep the freedom of the seas and continue the movement of our fighting materials for our allies and to our own forces. New Caledonia stands guard over the

ways, modern plumbing; they boast about the wonders they have seen and shared. The Irish, being proud people, resent comparison in which Ireland seems to come off second best."

And, of course, no guide book for American servicemen would be





complete without some discussion about the women in strange lands. In all the books there is at least one section designed to tip off the boys on how to behave, and to teach them some of the customs regarding the distaff side of life.

Here is what the book on North Africa has to say about women — a subject which is obviously close to the heart of a lot of servicemen on the loose in a foreign country:

"The social life of North Africa is very much different from our own, not only because of its leisurely character but because Moslem men do not make companions of their women. . . . It is not conventional for men and women to make dates. Should a respectable woman be found conversing with a man not of the family, scandal will result and sudden death is apt to overtake one or both parties. When a woman walks abroad with a man — even though he be a member of the family — she keeps several paces behind him so that people will not notice them together. Ladies never attend parties with men and seldom eat or drink with them even in the family."

More sprightly — but somewhat discouraging — is the advice on women in the guide to Hawaii:

"Girls are scarce in Hawaii. When

you've been off the boat for as long as 23 minutes, you'll find that telephone numbers here carry the same classification as war plans. They're marked 'secret' and kept in money belts. If, by hook or crook, you latch on to a few numbers besides the laundryman's you may wind up with a date. If this miracle occurs, the two of you can go swimming, walk, take in a movie, or dance. If you're numberless, you can still go swimming, walk, or take in a movie.

"Which is to say that a uniform is about as novel as a light bulb in a pre-war sign on Times Square. And there simply aren't enough wahines (gals) to go around."

Backshish, the serviceman who reads the book on Egypt is told, "means something free, a tip, a gift of money, some extra reward. It is probably the first Arabic word you'll hear as you land in Egypt. Partly because you are a well-paid soldier, but more because of the careless lavishness of pre-war American tourists of the wealthy type, you will be fair target for cries of Backshish. Don't be a sucker. To fling out coins and watch the boys scramble madly is small-town stuff. And you'll have a mob following you that'll ruin the rest of your day."

Egypt's book also has some appropriate advice on the art of "bartering."

"Bargaining," it says, "is a national Egyptian pastime, sport, art, and safety valve. Thanks to American movies and tourists you'll always be asked more than a Briton or Frenchman. But it is only the asking price. Offer one third what you're asked. Than haggle, without losing your temper or being discourteous. You can use the old American custom of horse-trading to good advantage in your dealings with Egyptian merchants."

Similarly, there is this tip-off on the famous Chinese "squeeze" system outlined for the information of troops assigned to China:

"You have probably heard a good deal about the 'squeeze' system in China. The Chinese, being intensely practical people, have recognized this human tendency to take a 'squeeze,' or a commission, and consider it legitimate. That is, you must expect anybody who does buying for you, however large or small, to add 5 or 10 per cent to the price for himself. If he takes no more than 10 per cent, he is within the Chinese law, or at least the law of century-old customs. Once one accepts this custom, a good deal of fret may be avoided. The 10 per cent squeeze also explains why servants can afford to work for such low wages for you."

How to spot a Jap from a Chinese is told in strip cartoon technique in the guide book to China. Given half a chance, the Jap will try to represent himself as a Chinese. The Jap will be short, squat, with almost no waistline; his skin lemon-yellow, his whiskers fairly heavy, his eyes slanted toward his nose. There will usually be a wide, calloused space between his first and second toes where a thong ran to bind his sandals before he began to wear shoes. He can't pronounce our liquid "l" and he hisses on any "s" sound, so try him, urges the guide, on "lala-palooza."

Wherever Moslems constitute a large part of the population of a country, servicemen are warned to mind their p's and q's and be respectful and understanding of a native's religion. In fact, they are told, it is bad medicine for a visitor to get too close to a Moslem mosque anyway, as the guide to West Africa cautions:

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lems in a community, there you will find a mosque. This is their church and they are very touchy about it. Never enter a mosque unless a Moslem asks you to go in with him, and when you do, be sure you take off your shoes. Don't loiter about a mosque; don't try to peek inside. You may run across groups of Moslems reading the Koran and glorifying Allah with chanting and drumming. Don't get too near; don't laugh; don't try to take pictures, or you may have to defend yourself against an angry mob. They take their religion very seriously."

The Aussies and Anzacs

Americans have much in common with the people of Australia and New Zealand, according to the guide books to both countries. In fact, the Aussies and the Anzacs, the American serviceman is told, have been doing a spot of fighting themselves. Here's what the guide book authors told the Yanks assigned Down Under:

"There is one thing to get straight, right off the bat. You aren't in Australia to save a helpless people from the savage Jap. Their soldiers, in this war and the last, have built up a great fighting record. They've fought on nearly every battlefield of the war; they've suffered heavy losses; and they're still in there pitching. The Australians need our help in winning the war, of course, but we need theirs just as much. You might remember that when you get into an argument about 'Who's going to win the war?'"

Two years before Pearl Harbor, Military Intelligence Division of the War Department entered the battle of words with plans for a series of foreign language pocket dictionaries for the use of servicemen abroad.

With the assistance of a group of scholars, poets and litterateurs, the

dictionary project gave birth first to handy little translations in Spanish, Portuguese, German, French, Italian and Russian.

As war's tempo speeded up, dictionaries were printed in Dutch, Malay, Chinese, Cantonese, Bulgarian, Icelandic, Swedish, Hungarian, Greek, Albanian, Serbo-Croatian, Persian, Rumanian, North African, Arabic, Danish, Turkish, and Japanese.

Adjunct to each foreign language edition is a set of records to which the serviceman may listen while he is studying his dictionary. The "kits" come equipped with a set of recordings and 200 technical manuals so that soldiers may study a language in groups.

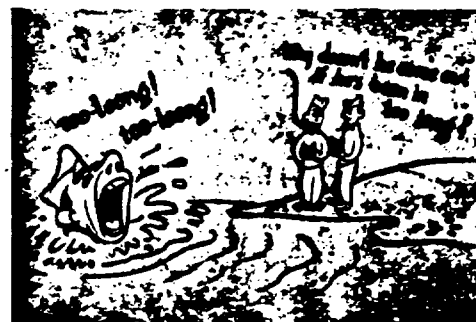
The pocket dictionaries run to about 60 pages of text, and throughout most of them are generous sprinklings of humorous cartoons to aid visually in teaching the soldier. Each guide includes brief instructions and tips on pronunciation of the language, and translations of useful words and phrases such as how to ask for the location of a restaurant, and how to order a meal.

Uses of the handbooks for intelligence and combat officers have been found to be practically unlimited, says the War Department. They have been valuable in deciphering documents and interrogating prisoners. They have facilitated communication with inhabitants of occupied territory, whether friendly or enemy. They have been important also in helping soldiers learn the different parts of foreign weapons, mechanized equipment and machinery.

If he carefully digests the material, the soldier should have no difficulty in picking up a smattering of a language that will get him by in the land where he is assigned.

Unsung heroes of the war, the

G-2 boys of the War Department are fighting a mighty battle of words with their useful pocket guides and dictionaries for global warfare.



Humor helps a soldier get the point of foreign tongues





FOR SERVICE

By Meredith Littlefield

CLIFFORD J. PATTON is a man who believes that things should be built to last, whether you are dealing with an intangible something like a man's character or a physical object like a gasoline engine. At 77 years of age, he can look back upon a unique experience in both directions.

Out on his Kerrig Mawr ranch in Kelseyville, California, Mr. Patton has a stationary gasoline engine that has been in continuous service for 45 years. In all that time, it's been a faithful workhorse, for the most part pumping water for a dairy and truck garden on the ranch.

Originally the engine, an Aermotor, was designed to operate a windmill on still days. This was back in 1900. But from the very start it was used to pump water for a dairy farm, 12 hours a day.

The engine was in operation for 14 years when it came into Mr.

Forty-five years is a long time to keep a gasoline engine going — but it's all in the know-how, says this septuagenarian

Patton's possession back in 1914. For the next 11 years, it ran ten hours a day, supplying all the water needed for the dairy and truck farm. Thereafter it worked an average of five hours a day.

The engine continued to live a quiet, though useful, life until early last year when at last it began to show signs of old age. As Mr. Patton explains it, "The engine was getting tired and hard to start, so I began to look for one to take its place." "However," he adds, "I wanted one that would last this time."

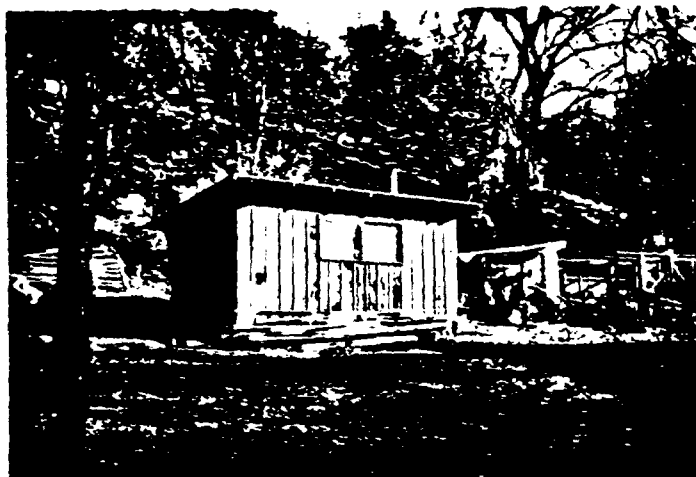
Mr. Patton couldn't find the engine he wanted, so he began thinking about rejuvenating the old one. Previously, its manufacturer had informed him that it no longer made replacement parts for its 1900

model. Whereupon, Mr. Patton declares, he went ahead on his own changing the motor from a make-and-break ignition system to a Ford spark arrangement. "It is now working 100% and may last another 4 years," Mr. Patton says.

For the last 11 years, Mr. Patton has been using Ethyl gasoline exclusively in his stationary engine. Moreover, he has kept it well oiled, and covered it in stormy weather, which is another reason why it continues to give dependable service after all these years. "This engine," he says, "shows what can be expected of a piece of machinery that is cared for properly. So many owners of machinery blame the makers, while it is careless use that causes trouble. Like the case of the balky horse, 99 times out of 100 it is the fault of the balky driver."

But Mr. Patton's "Old Faithful" engine reveals only one facet of his interesting personality. Another becomes evident when he tells you about the homeless boys he and his wife have sheltered and raised. In the last three decades, the Pattons have reared 45 homeless boys and given them their start in life.

Back in 1915, when the Pattons took up farming, their love for children manifested itself. Through arrangement with the authorities, they began to take in boys who were homeless, or wards of the state, and give them a home and educa-



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tion. Three boys at a time were taken in, usually between the ages of 11 and 13. When the first three had completed their education, another three would join the family. Separate barracks, with all the comforts of home, were built for the youngsters. And though they shared

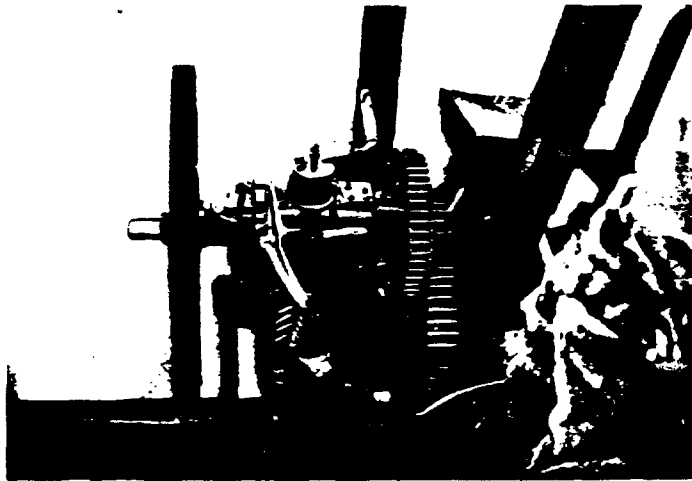
Chicago. At the conclusion of the Fair, he was one of those chosen to go to school and study to be an Army teacher. After receiving his commission, he went from one Army post to another, finally winding up in the Philippines. There he was wounded, and invalided out of

Later, when he decided to swap teaching for farming, it was natural that his fondness for boys should prompt him to open up his home as he has. A few years ago, he retired from active farming to devote his time to raising pedigreed cocker spaniels.

Today, when a visitor drives up to the Patton ranch, he'll be cordially greeted by Mr. and Mrs. Patton and their three current boys. There's one member of the Patton household, however, who's nowhere as cordial as the rest. He is a goose.

The goose has a fierce and fond attachment for Mr. Patton, follows him around like a dog wherever he goes, and answers to his call. Visitors talking to Mr. Patton have to be careful not to gesticulate with

Here's the indomitable engine, still going strong, after 45 years of service



in the farm chores, it was not in the capacity of employees — they were members of a large and growing family, all boys.

Mr. Patton's urchin brood has been growing ever since. Today, 45 men and boys can look back upon the Patton ranch as the place where they got their start in life — and only two of them ever strayed from the straight and narrow path. More than 25 are in the service, with ratings and ranks up to that of Major.

Clifford Patton himself had a long record of military service that began in 1886. He took part in some of the final Indian campaigns. Then in 1893, he won a competition to play with the Army band that performed for the Columbian Exposition in

the Army. He retired with the rank of Major.

Back in the United States, he accepted a teaching position in a high school. His love for boys soon made him Dean of Boys at the school.

their hands. Mistaking the gestures, the goose is sure to come tearing in, snapping at anyone whom he thinks is about to harm his master.

Yet the goose, though a fiery old brute, proves one thing about Mr. Patton. He has a rare understanding — of engines, animals and men.



Here on a tour of inspection with his master is Mr. Patton's pet goose

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ume of damaged ships than any nation has ever handled before — and you have a combination that's impossible to beat.

Last year, some 15,600 new ships were constructed in our expanded shipbuilding industry. That is a top record. In the same period, however, our ship repair yards took in more than 23,000 ships and made them completely seaworthy again. That's another world's record!

Miracles in dry dock have become commonplace, yet the facts are not generally known. A new ship is launched with ceremony, music and a flood of inspired oratory. A ship is repaired without fanfare or headlines. Our genius for making ships fit for service is a typical American one that utilizes old methods, plus amazing new and efficient techniques, and the most modern equipment possible to devise. It's an industry that is managed by men with a strong backlog of "know-how" that comes of wide experience and training.

No Easy Job

Repairing a ship that is badly damaged is a major project. It is one that is involved and curiously complicated by many factors.

A badly blasted ship, a semi-victim of an enemy sub, bombs, mines or shellfire, manages to reach port. Parts of the ship are jumbles of twisted steel and shattered plate. Piping — and there are miles of it on a big ship — is twisted like a tangle of yarn — an incoherent, broken mass of metal tubes of various sizes and manifold uses. Electrical systems, air ducts and machinery are a maze of unidentified metal. It's a mess, no question about it. All damaged parts must be renewed and correctly and properly installed.

This, in itself, is a tremendous job, even if the repair yard is fortu-

nate enough to have the working drawings or plans of the ships. However, often the plans for the ship are not readily available. They may be in Glasgow, Milan, Singapore, or points in between. That makes it tough.

But the naval architects and marine engineers in the repair yards never let a lack of plans delay the work. These men are shipwise, shrewd as to ship design, instinctively correct in visualizing the proportions of the damaged parts of the ship. They have to be. A ship, aside from being one of the most complicated structures made by man, is also one of the most delicately balanced things in the world — and this the repair people have to keep in mind at all times.

Some of the things this industry has accomplished border on the miraculous. Once, in the South Atlantic, a sub sent a heavily loaded torpedo into the exact midship section of a tanker. It must have been heavily loaded, because the resultant explosion destroyed an area of 150 feet, bending and shattering the

hull and damaging the machinery.

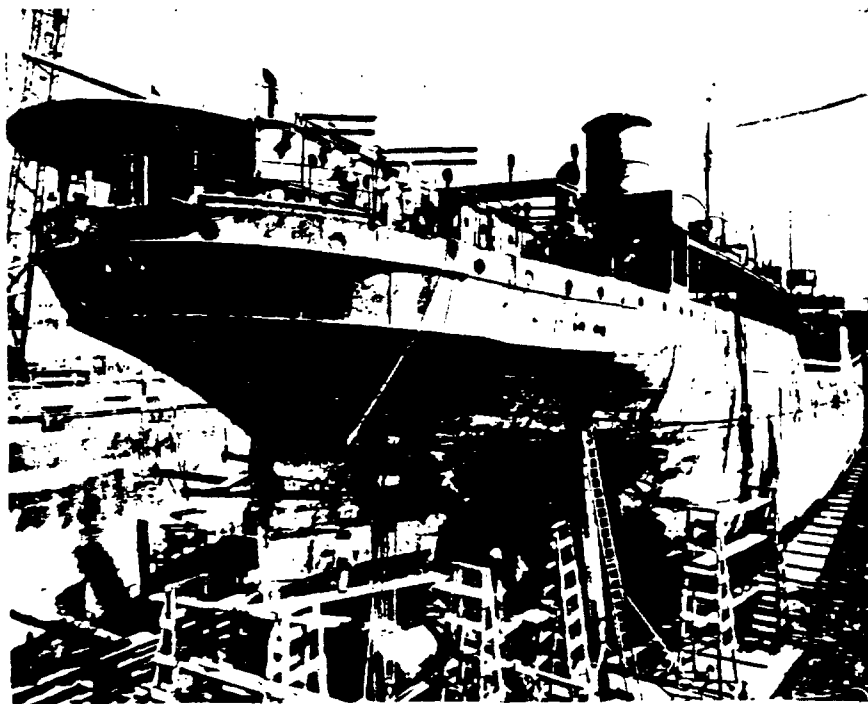
Yet, the ship did not sink. It was towed into a South American port where some pretty crude but effective surgery was done. The entire 150-foot section was removed. The two remaining ends of the tanker were pushed together and joined.

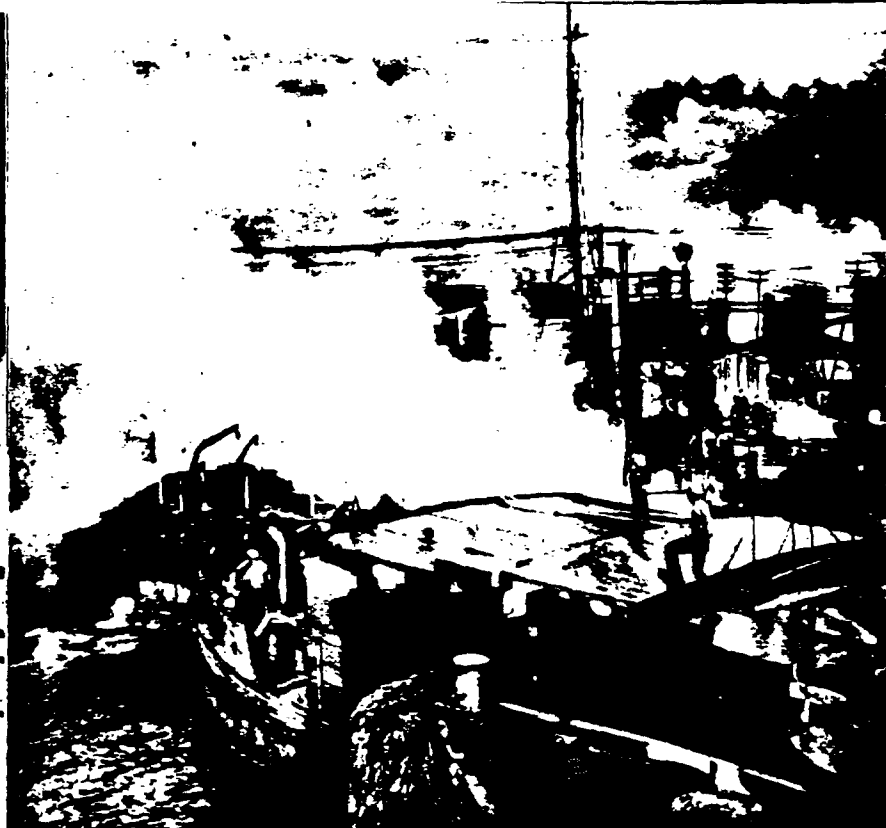
Made Port On Her Own

The ship started for an American ship repair yard under her own power, a most peculiar-appearing ship and one calculated to cause comment and speculation in maritime circles. She made port. Then, came another major operation, plus a grafting job. The two halves were cut apart. A new 150-foot section had been pre-fabricated, and this was pushed into dry dock, too. The ends were welded on this new section — and it fitted to within a fraction of an inch! That's real planning. Soon the tanker, as sound as ever, was back at sea in active service. You can't keep 'em down!

Ships come in with strange and savage wounds. Sometimes they reach port under their own power,

Victim of a sub, this ship still lived to sail again — thanks to the ingenuity of ship repair methods and men





Repairing a ship frequently begins from the moment of damage, with skilled repair men rushed to the scene

This gaping wound is but a routine job to the men in the shipyards, armed with new repair techniques



sporting gaping holes in the hull through which a truck could be driven. One wonders how the ship managed to survive. Regardless of their condition, the ship repair industry soon has them patched up and back into service.

The repair people are specialists and experts. You will find about seventy skilled trades working in a yard. Each phase of the work not only requires careful planning, but calls upon many trades.

Damaged warships, our own and those of the other United Nations, naturally demand special techniques. A part of the work is done in Navy yards, but a high percentage is done in privately operated ship repair yards.

Surveyed Damage by Air

Illustrative of the techniques employed is the story of a damaged American cruiser, on the receiving end of some Jap shells in the South Pacific. As she was limping toward the West Coast to refuel before going through the Canal, experts from the Philadelphia Navy Yard flew to the Coast, met the ship, surveyed the damage, and took closeup photographs of it. They immediately flew back and went to work on their plans.

When the cruiser nosed into dry dock in Philadelphia, every phase of the repair work had been carefully planned beforehand. Workers in certain trade classifications were ready and waiting; every item of material, equipment and machinery needed was on hand, placed where it could be reached without delay. Every working schedule had been set up. That fighting ship was back into service in jig-time. It was a shrewdly planned operation.

The ship repair people also convert ships to purposes other than those for which they were originally

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built. At the outbreak of the war, these American yards handled a terrific volume of conversion work, all carrying an URGENT tag. There were luxury liners to be converted into troopships, yachts to be made into submarine tenders, cargo ships to be

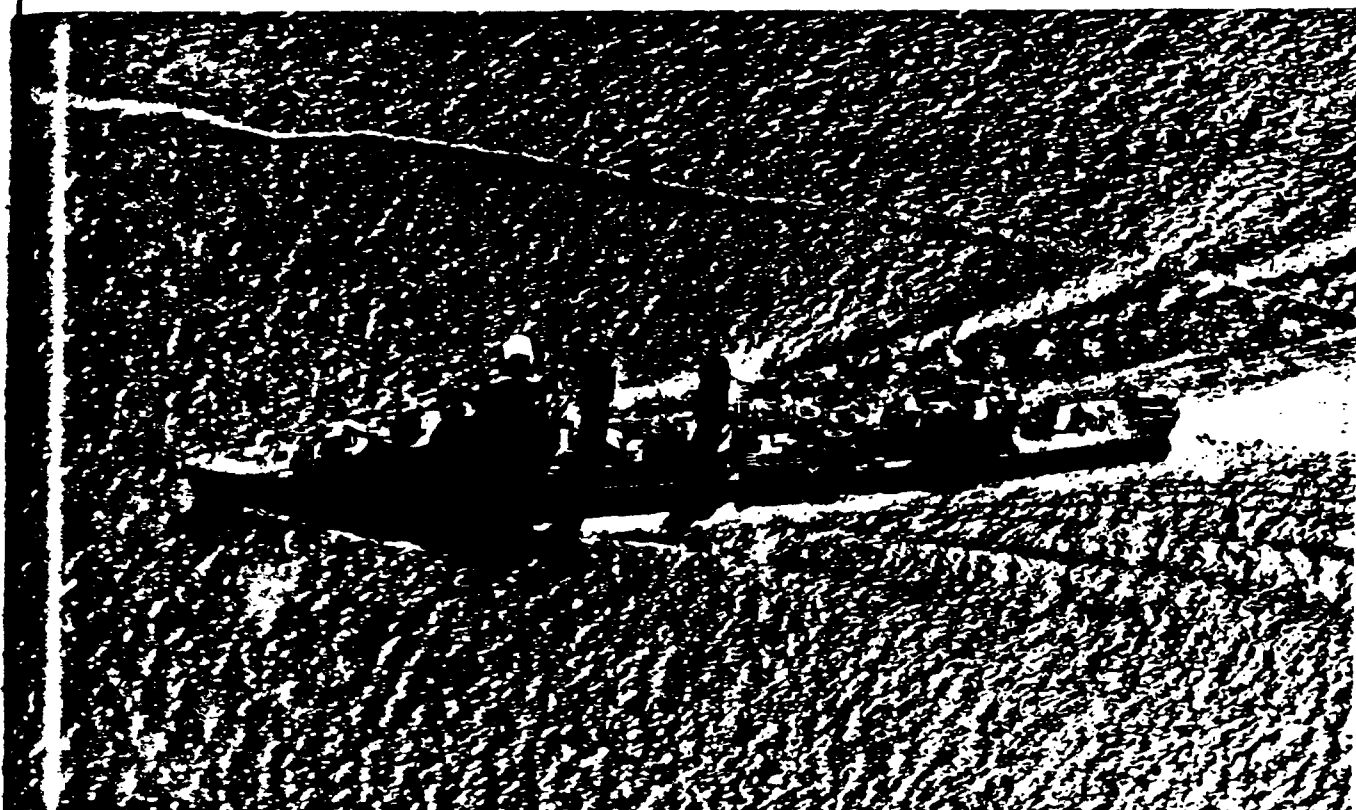
were raised, repaired on the spot, or sent to repair yards in this country. Today they are better fighting ships than before they were sunk — for they have been modernized, strengthened in every respect.

Take, for example, the *Nevada*, a

tions. In a war where logistics play such a major part, the ability to repair damaged ships and quickly put them back into service has been a vital factor in our military and naval progress in every theatre of war.

The ship repair people operate a

The destroyer Shaw, damaged at Pearl Harbor, was fitted with a temporary bow, sent to the U. S. for final repairs. And here she is — as she went forth to the wars again



made into hospital ships, fruit carriers to be converted into ships known as "refers" — refrigerated units suitable for transporting perishable foods to our troops overseas.

Virtually every warship sunk at Pearl Harbor went back in active service although several have since been decommissioned as obsolete. The salvage job was the greatest the world has ever known. The ships

battleship that had been a victim of the sneak attack. She's seen plenty of combat service since. At Attu she took some large bites out of the Japs; she played an important part in both invasions of France, and her gunnery commanded the respect and admiration of those taking part in the biggest invasion ever known.

Today, we are the ship repair headquarters for the United Na-

hospital where every patient must be cured. They never know what the next job will be, or when it will arrive. No two jobs are alike. They live and work in an atmosphere of extreme emergency. The men who repair ships cruelly smashed by the enemy have no illusions about this war and its toughness. It is very real to them. Possibly that is why they do such a superlative job.



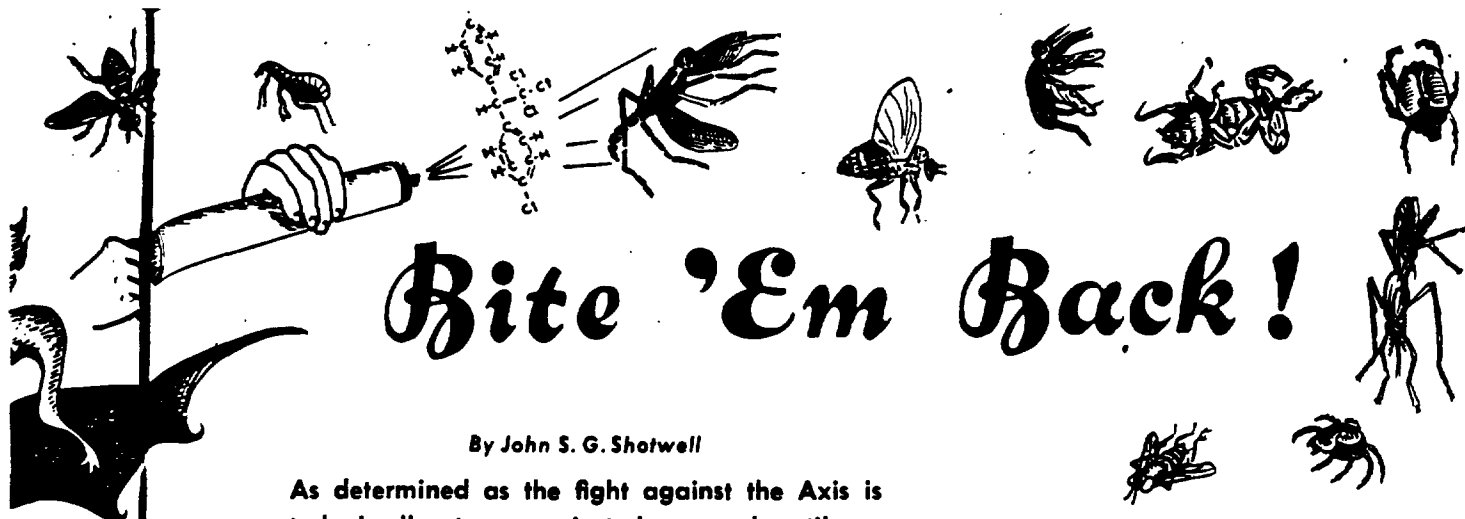
Biblical Jerusalem and Seventeenth Century London Suffered Great Pestilence



An Eighteenth Century Plague Doctor

Napoleon in Joffa during the Bubonic Plague





Bite 'Em Back!

By John S. G. Shotwell

As determined as the fight against the Axis is today's all-out war against plague and pestilence

INSECTS have killed more men than all the wars in history put together.

Epidemics caused by the creepers and crawlers, jumpers and dive bombers of the insect world have often swept across continents, destroying nations and civilizations. Malaria-carrying mosquitoes were partly responsible for the decline and fall of the Greek and Roman empires. The blood-sucking louse and flea are said to have contributed to the disintegration of the Arab world into its present relatively minor role.

Epidemics of insect-borne diseases have often accompanied military campaigns — and robbed the victors of their spoils. Alexander the Great died at the height of his career from a mosquito bite. Yellow fever and malaria held back development of Central and South America by the European powers after they had conquered the New World. Influenza and typhus epidemics and the bubonic plague have relentlessly swept across Europe, visiting death upon victor and vanquished alike.

The war between man and insects has been going on ever since the first man took the trouble to scratch himself. But it has remained to the 20th century for man largely to wage this war successfully.

The first large-scale campaign began with the construction of the Panama Canal, and freed the Canal Zone of yellow fever. Indeed, the building of the Canal has been called a triumph in sanitary engineering first, in civil engineering second. The U. S. Army, which did both jobs, drained the swamps, cut down underbrush, and sprayed with oil all pools, stagnant water and soggy ground. The Canal Zone, however, is a relatively small territory, and while other small regions have since been cleared of death-dealing insects, no large area was freed until

EDITOR'S NOTE: *The author, in civilian life a consulting chemical engineer, served with the U. S. Army Forces in Australia as a lieutenant colonel. There he had an opportunity to learn at first hand the many diseases faced by troops stationed abroad — and what has been done to check them. In this article he discusses some of the recent progress that has been made.*

the present war came along.

World War II will, in fact, go down in history as the start of the biggest concerted drive ever launched against our insect enemies. As never before, our medical men have gone all-out against the louse, the flea, the tsetse fly, and the deadliest of all, the anopheles mosquito. How successful they have been to date is apparent in the hordes of fighting men who have been saved from the ravages of disease. The results thus far accomplished give every reason to believe that many insect-borne diseases, frequently fatal, will be controlled and eventually wiped out.

Ironically enough, when the war broke out, it made our fight against disease-carrying insects doubly



hard. The war in the Pacific, on the one hand, brought our men into contact with tropical diseases — some of them new and baffling — on an unprecedented scale. At the same time, the Jap conquests of the Netherlands East Indies and other places cut short our supplies of botanical drugs, the standby weapons against these insect-borne diseases.

But since Pearl Harbor, there's been a feverish search for substitutes, for replacements, and for entirely new weapons to combat our insect foes. Even old and discarded chemical formulas have been dusted off — and freshly studied for new applications. It was in this way that one of the war's most spectacular bug killers was uncovered. That bug killer is DDT.

DDT is the abbreviation of its

chemical name, dichloro-diphenyl-trichloroethane. It was first discovered in 1874 by a young German chemist named Othman Ziedler who, after making the discovery and describing its preparation and chemical properties, promptly buried it in the scientific archives.

There it remained for more than half a century, until one Paul Müller, an employee of the J. G. Geigy Co., Ltd., in Switzerland, began using it as an agricultural insecticide in the late 1930's. Its effectiveness was proved when it saved the 1939 Swiss potato crop from destruction.

Then in 1942, a small sample of the substance was sent to Geigy's New York offices, together with some descriptions of the Swiss experiments. The U. S. Army, learning of the insecticide, became inter-

ested in its possibilities as a delousing agent. The Army experimented with DDT on its own, found it acceptable. This led to the placing of orders in quantity — to its use among troops overseas — and finally, DDT came into its own.

Perhaps its most spectacular use was in stopping the typhus epidemic that swept Naples in 1943. The epidemic came on from the population having had to sleep night after night in underground caves, to escape the bombing raids. But there have been many more successful applications, big and little, of this miracle-working chemical.

Take, for example, the time it helped two U. S. Army officers to score an important diplomatic coup.

The officers arrived at the camp of a none-too-friendly Arab sheik and found him in an exceedingly ungracious and uncomfortable mood. He was busy scratching himself. The men persuaded him to let them dust him with a few puffs of DDT from their "gun." For a few moments the sheik kept on scowling, but then a look of wonder crept over his face, and finally he broke into a broad smile of delighted comfort. His favorite horse was immediately brought in, next his wives, children and servants in their order of favor. The next day the remainder of the camp lined up, and the supply of DDT rapidly dwindled. It was the first time in their lives that these people had been entirely free of lice and fleas. DDT won staunch new friends for the Allied cause.

The popular notion that DDT will kill all harmful insects in sight, however, is wrong. It has its limitations.

It effectively destroys mosquitoes, fleas, lice and other blood-sucking insects — also potato bugs, Japanese beetles, codling moths,

To fight Naples' wartime typhus epidemic, DDT and talc were made into a dusting powder in this cement mixer



and such household pests as flies and cockroaches. But it is relatively ineffective against such agricultural pests as Mexican bean beetles, red spiders and cotton boll weevils. In large amounts, or when too-strong solutions are used, it will poison animals; but when properly compounded for use as a dusting powder or insect spray, it is harmless to humans and domestic animals. DDT is soluble in many oils but is insoluble in water. Hence, plants, clothing, buildings, ground and even ponds and lakes may be rendered insect-proof by DDT without the danger of losing its protection by rain or washing.

It was in much the same way as DDT that an important new war use was discovered for another chemical compound. That chemical is Freon — the non-toxic, non-flammable refrigerant — which was invented by the late Dr. Thomas Midgley, Jr., and which is the leading freezing agent used in refrigerating and air-conditioning systems.

The Aerosol Bomb

Earlier in the war, it was discovered that Freon made possible a potent new weapon against malaria: the aerosol bomb. The bomb, which is in reality a spray gun, is loaded with a mixture of pyrethrum extract and sesame oil, together with a charge of Freon. When ready for use, the Freon vaporizes the mixture, and forces it out in a high-pressure spray. That spray saturates every crevice and corner of a tent or foxhole — bringing sudden death to malaria- and other fever-carrying mosquitoes. But while deadly to insects, the insecticide is entirely harmless to humans.

The war against disease-bearing insects begins even before our troops leave for overseas. Every serviceman receives his quota of

inoculations — and further shots against any particular disease to which he might be exposed in a given climate. The men are thus protected against yellow fever, typhus, cholera and bubonic plague — diseases which in previous wars have taken a greater toll of armies than their human enemies.

Overseas, these inoculations are repeated at stated intervals, to preserve the troops' immunity to infection. At the same time, the men are supplied with delousing powders, such as DDT, and aerosol bombs in tropical countries. Furthermore, thoroughgoing sanitation measures are instituted. The drinking water and food are purified, barracks are screened, stagnant pools and other sources of infection are cleaned up. Such protective measures as these have helped to curb the incidence of disease and to prevent the outbreak of epidemics.

In the early stages of the Pacific war, an even greater threat to our forces than the Japs were such diseases as malaria, dengue fever and amoebic dysentery. Of the first 20,000 casualties suffered in the New Guinea campaign, for example, fully 17,000 were caused by malaria. Now, thanks to the potent weapons in our chemical arsenal, these diseases have largely been checked. Many of the islands where our troops are stationed, formerly pestholes, have been cleared of their deadly insect life, along with the Japs. Saipan is a recent and vivid example.

Of all the tropical diseases, malaria is by far the most prevalent and persistent. As with dengue fever, there is no known inoculation to prevent it. To guard against it, however, troops stationed in the tropics take prophylactic doses of quinine or atabrine.

Before the war, quinine was the

standard cure for malaria — but with the Jap occupation of the East Indies, fully 90% of the world's supply was lost to the Allies. Since then, the planting of cinchona trees (whose bark yields the quinine) has been stimulated elsewhere. Too, after years of effort, quinine has at last been synthesized in the laboratory, although its commercial production in this manner is said to be a long way off. Meanwhile, however, there is an effective substitute for quinine in atabrine, and that synthetic today is serving on all the tropic fronts.

The possibility that many veterans will be returning with tropical diseases is being met by medical authorities. Each returning veteran undergoes careful examination and treatment, if necessary, while preventive measures previously taken overseas have already cut the incidence of disease tremendously.

They'll Bite the Dust

Measured in terms of success against our insect enemies, the post-war world will be very different from the pre-war one. The mosquito, flea and fly will have disappeared from many areas, and be rare in others. Then, such scourges as malaria will no longer attack two hundred million people annually, as before; similarly with yellow fever, dysentery, typhus and the bubonic plague. Moreover, the potato bug, the Japanese beetle, the codling moth, and other pests will no longer be the bane of the farmer's and gardener's existence. The boll weevil and corn borer, too, will bite the dust, no longer destroying millions of dollars worth of crops each year. The native of equatorial Africa will cease to be a victim of sleeping sickness, carried by the tsetse fly, and the Arab may once more regain his place in the sun.

High Road

THE NEW STILWELL ROAD REPRESENTS

The Japs' 32-month land blockade of China was broken when this first convoy completed the trip from Lado to Kunming



Everybody helped — even this native Lisu woman — to build the Lado Road



A China-bound truck stops for gas at a point along the thousand-mile highway

oad to China

PRESENTS SIGNAL VICTORY OVER THE JAPS

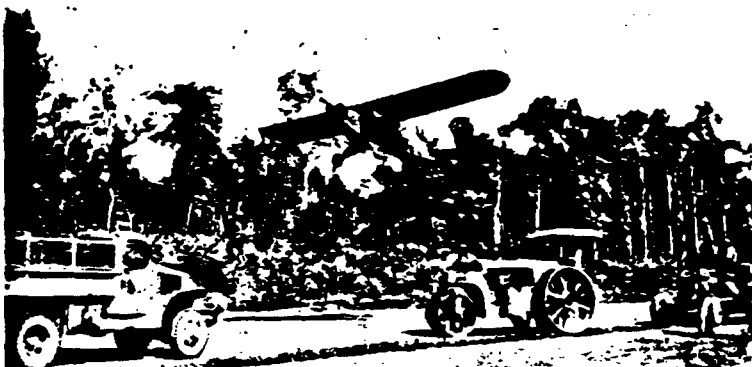
The highway project, completed by Brig. Gen. Lewis A. Pick and his men, was accomplished despite terrific odds, ranks as a great engineering achievement

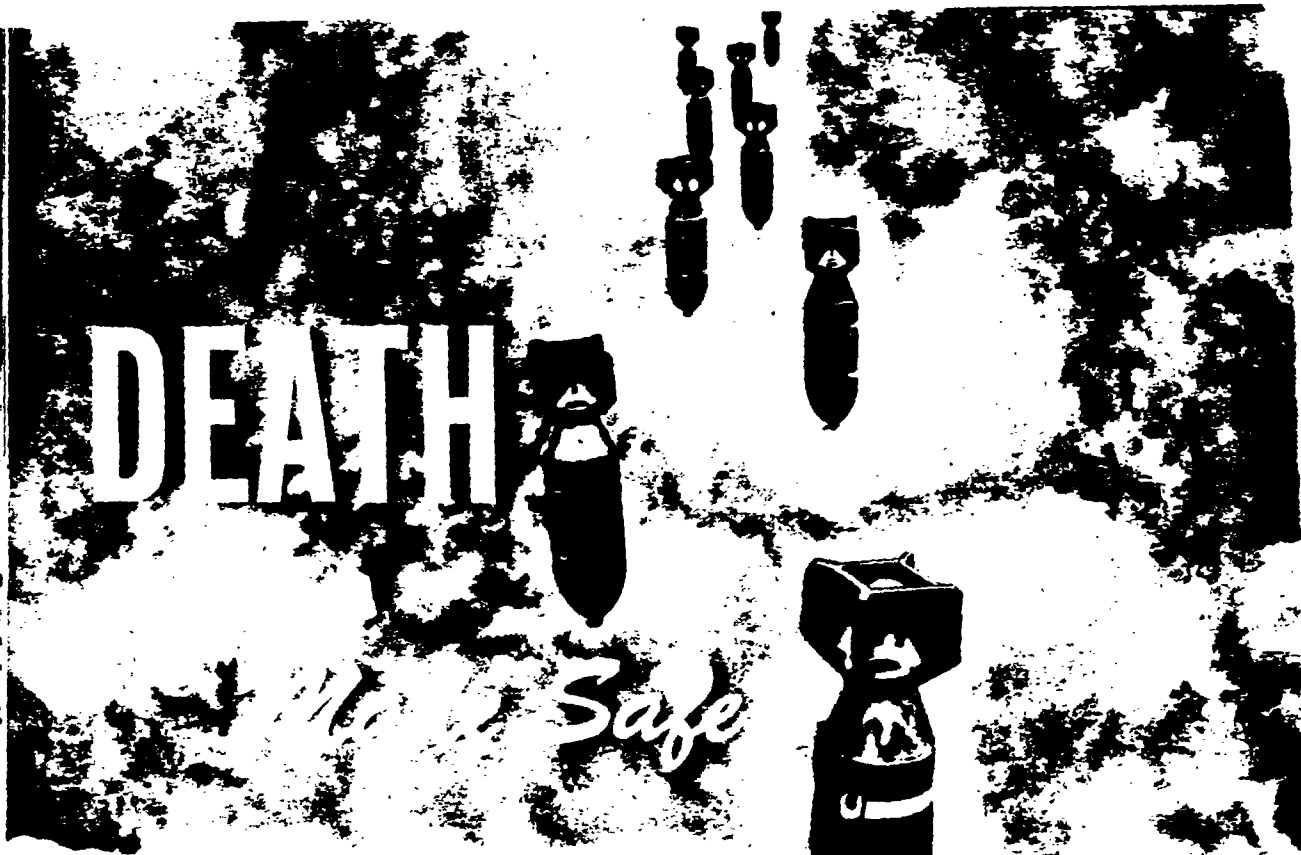
THE NEW Ledo Road brings the cost of transporting oil to China down to earth.

The most needed weapons of war in China today are cars and trucks and the fuels to run them. Heretofore this cargo has had to be flown over "The Hump" into China. Besides the great danger of flying the Himalayas, it has been estimated that it cost as high as \$40 a gallon to deliver gasoline in Kunming, approximately \$50,000 to deliver a truck. Now, this vital cargo will travel over the Ledo Road in an unending caravan, at a fraction of the former cost.

The new Ledo Road — officially called the Stilwell Road — marks the second of three transportation arteries to China that have been opened since the war. The third will be the new CBI pipeline — 1,800 miles long — which when completed will pipe oil supplies from Calcutta into central Yunnan Province.

Through mountains, jungles, rivers and Japs, the Ledo Road was pushed. And now, a new pipeline, being built, will provide a third route to China





By North Clarey, Jr.

Even direct ack-ack hits on our bombs won't set them off — before they reach their target

HE's one of the boys you know in the Army Air Forces — let's say he's in the crew of a B-29 super-fortress. His plane is over Nagasaki, ready to drop tons of high explosive bombs on the steel works there, and they're catching the devil from flak and fighter planes. Every so often he'll hear a thud; the plane will shudder. Fragments will ricochet off the very bombs beneath him with a sickening *ding!*

How is he — and the rest of the crew — taking it? Will that scrap iron, beating against the tons of super-TNT in their bombs, set them off?

Well, no airman likes flak, but when they hear a piece bang into

one of their bombs they think to themselves: "That's *one* that didn't have our number on it!" They're not crazy. They just know that all their cargo of stepped-up TNT, the most violent form of death in the world, will not explode until it lands on the ground below them.

What's inside that package of death, and why won't it go off? You've seen pictures of bombs, heading earthward, in the magazine advertisements — drab olive watermelons, streamlined, with a yellow ring on their noses and a box-like set of fins on their tails. Each one is a metal shell poured full of molten TNT, or TNT mixed with something more potent, and fitted with a

complicated fuse mechanism which will touch off the hellish explosion just at the point when it will do the most harm. Even Goebbels has confessed, long before the invasion started, that our bomb was blowing the Heil out of Hitler! And yet, for our men who drop it on Axis land it has been made *safe*. It's as harmless as a sleeping lion.

How is this miracle accomplished?

By a long chain of ingenious and precision-built safety devices. By mixing a lot of common sense into the sinister chemistry of explosives. By infinite surveillance — checking and double-checking the elaborate safety measures in each step of manufacture, shipment, and handling of all military explosives. Even in brief outline, it's a fascinating story.

Take one of those bombs in your

friend's B-29, high over the razor-backed mountains of Japan. It illustrates a basic principle in American ordnance: the more deadly a shell, a rocket, or bomb that we make, the more elaborate are the measures we take to see that it doesn't go off until it reaches the enemy. Look at the outside, the metal shell. It will rupture into a hail of murderous fragments when the bomb explodes — and yet it is tough and thick enough not only to batter its way into the innards of a ship, tank, or fort without smashing, but to protect the explosive inside it from being set off in a plane by anti-aircraft fire.

Stable Charge Needed

The second element of the bomb is its explosive or bursting charge. We can tell you, within the bounds of military security, that the bursting charge is either highly explosive trinitrotoluene, or "TNT" blended with something that has still more kick and needs the stabilizing influence of TNT to keep it well-behaved. TNT is not too sensitive to shock or heat, in spite of its destructive power. We know of many more compact, more violent explosives, but they are unstable, unreliable; and we don't want to gain such an advantage at the cost of American lives. We could make nitrogen iodide, for instance, which will go off almost if a fly sneezes on it — but that's a little too touchy.

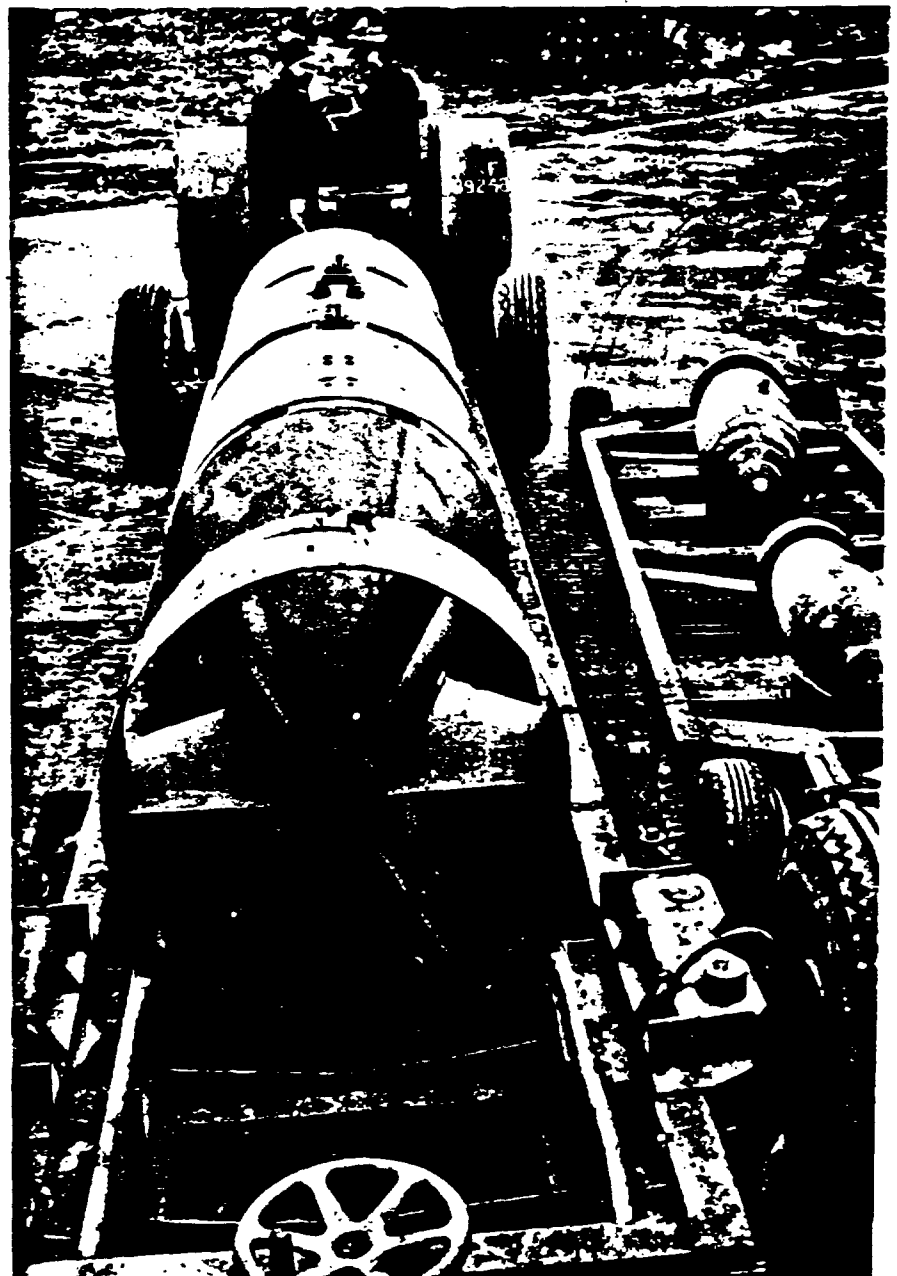
The Germans aren't so careful. When the Allies captured their robot-bomb launching sites on the French coast, we learned that the super-high-explosive which had enabled their buzz-bombs to wreak such tragic destruction in London had also taken a heavy toll of German soldiers from premature explosions.

Going back to our bomb, we

come to the fuse itself — the nerve center that controls the rest. Here you see our twin principles of destructiveness and safety closely coupled. Fuses are tailor-made to suit their jobs. If your aviator friend in the B-29 wants to spray shell fragments over enemy personnel on the ground, he'll use a time fuse which sets off the bomb just before it reaches the ground. If he wants to knock out a train or tank he'll

use a fuse which goes off on contact — or set an adjustable fuse to do so. If he wants his bombs to go off *after* they have penetrated the armor of a ship or fort, he'll employ a delayed-action fuse. If he were out bombing subs, as Navy planes do, he'd be using hydrostatic fuses that go off at a certain depth under water. And of course you remember, from the London blitz, those long-time bombs which may not go off

A 12,000 lb. bomb passes its 100 and 500 lb. cousins, as it starts on its way to Berlin





The woman at the left is inserting a booster charge into a bomb, after a workman, right, pours in molten TNT, the main explosive

for days, paralyzing all human traffic in that region in the meantime. Well, he could do the same to the plant at Nagasaki by using a similar fuse — an arrangement timed by the slow corrosive action of acid on metal.

But how are all these fuses made so they won't go off prematurely, from rough air, or if through some fluke the bomb should hit a friendly plane below you? A shiny little propeller, sticking out the end of the fuse, is the answer — and it's all the same whether your bomb is fitted with a nose fuse, a tail fuse, or both. An "arming wire" passes through the propeller while the bomb is in its rack on the plane, so it can't turn — but when the bombardier drops his stick of bombs the arming wire on each is pulled clear and the propeller begins to spin, unscrewing itself so that after several hundred yards of fall it drops

off. This removes a mechanical block from the firing pin, so that on impact it will snap against a small, sensitive "primer" of lead azide or fulminate of mercury. This tiny explosion ignites the "detonator," a larger charge behind it — and that touches off a still larger charge, often of tetryl, known as the "booster." It's just like pushing over a row of dominoes. When the booster lets go, it explodes the main charge, anywhere up to three tons of souped-up TNT, in the bomb itself . . . and another Nipponese war plant ceases to exist.

Precise Devices

Mechanical fuses are built with the precision of a watch — which is one reason why lots of watch companies have not been making watches lately. And they're packed, like all ammunition except bombs and projectiles, in weather- and

shock-resistant containers. When shipped, they're handled like eggs and guarded like jewels — as is all ammunition in this country. And finally, to forestall accidents at the airfield itself, fuses are not screwed into place until the bombs are loaded in the racks under the plane. They *can't* go off until the bombardier drops them from the air.

Suppose, however, that our B-29 had run into engine trouble and had jettisoned its load of bombs over friendly Chinese territory to get home safely. They can be kept inert simply by not withdrawing those "arming wires" from the little propellers — and will bury themselves, bounce around, even crack open, without exploding.

There's your miracle. Death in its most sudden and violent form — for the little men with the almond eyes — has been made safe for our boys.

What will television offer the American public after the war? Here's a report based on present-day trends



VIDEO AFTER V-DAY

By F. Richard Anderson

IF, as that old Chinese proverb says, "One seeing is worth a hundred hearings," it is easy to grasp television's potentialities after the war.

It may eventually be vastly more important than any other present form of broadcasting.

It has an unsurpassed entertainment and educational value to the American family.

It has enormous possibilities for advertising and selling merchandise.

And here's what it will offer you:

Right into your own home will be telecast public events, forums, parades, exhibitions — as they occur. You will be able to see a new President take office, Congress debate an important measure, the World Series won. Plays, concerts, shows, soap operas and all the entertainment now offered by radio will take on new meaning — and form. Teaching by means of visual demonstration to a mass audience will become an integral part of education. Stores and companies will parade their wares before your eyes in the most effective way imaginable. All this will be yours, at the twist of a dial.

Already, there is ample evidence of what Mr. and Mrs. America (and



Mobile television units pick up on-the-spot events, relay them to the broadcast station for transmission

Looking out from the control room as a television program is broadcast from a CBS studio in New York



Junior) want to see and hear after the war.

According to the General Electric Co., which for four years has been making a continuing weekly survey of its television audiences, here are the program preferences: Sports programs rank high, variety shows are good — and more popular than dramatic, musical or educational programs. Light opera ranks high because it combines action, sound and plot.

Motion pictures are well accepted, but other things being equal, live studio programs are preferred. Motion pictures may rate better when more are made expressly for television.

Among musical programs, vocalists are outranked by instrumentalists, and soloists seem to be preferred over orchestras. And the reason for this, interestingly enough, is that television affords good closeups of the performing artists.

In the field of dramatics, comedies seem to be the most popular. Mysteries come next — and they have real possibilities. This is because television lends itself to so much trick stuff. Some weird and eerie effects can be obtained from double exposure of films, for example.

Naturals for Television

And speaking of trick stuff, puppets are a natural for television, says Robert L. Gibson of GE. "Puppets are too small to be seen on a stage but are wonderful on television," he declares. "And the actors don't have to learn their lines — they can read them as on radio. Puppets might be good to bring newspaper comics to life. Puppeteers may come into their own with television, as well as magicians and jugglers."

On the serious side, map talks are good in presenting news, GE finds, and newsreels are well received.

Educational programs are also welcome, especially if they cover a subject in the news.

In general, audiences prefer a master of ceremonies to having shows announced by titles or unseen voices. And announcers must be more accurate in describing performers than over the radio. Once, a television announcer glibly introduced an artist as "a very beautiful young lady." She wasn't — and in poured the complaints.

Commenting upon the GE survey, Mr. Gibson declared, "In reviewing what the audience likes or dislikes, we recognize that what the audience prefers is influenced largely by how well we have done certain shows. So let us consider these findings as straws in the wind — as indications and not as conclusions.

"It is my own personal guess that television may never be on the air throughout all hours of the day, as in radio. The necessity that listeners concentrate on the program may reduce the size of the audience, on the one hand, but by the same token, surely make advertising messages more effective.

"There is also the possibility that expensive studio programs will be repeated. New shows may not be put on the air each day any more than is being done in a motion picture house. Listeners are, we feel, more likely to 'plan' their listening; therefore, a good play might be put on several evenings of the same week."

If television causes the radio audience literally to sit up and take notice, as it will, even greater changes are in store in the broadcasting studio itself.

Many of today's radio stars, for example, are not noted for their beauty or their quick learning ability. But live talent television will call for real acting ability combined

with good looks, plus an ability to learn parts quickly. Many of today's radio stars will fall by the television wayside or play character roles in which their personal appearance will be to their advantage. Moreover, many of today's stars of mystery and adventure shows very likely will be called upon to dress — and look — their part. Their dramatizations will not be able to draw upon listeners' imaginations, as radio programs now do.

New Twist in Sports Events

In covering local events, many television stations are likely to have mobile televising units, similar to those in use today by radio. These units will contain cameras and other equipment, mounted on trucks, so that sporting events and similar public affairs can be televised as they take place. Conversely, it may be that some time in the future sporting events will be brought to the television camera — and not the other way 'round. This is already being done in GE's television station, where once a month boxing and wrestling matches are held in a regulation ring in the studio.

On the other hand, television has its limitations for shows originating in the studio. Soap operas and other live talent shows, by and large, will have to stick to minor changes in scenery. There can be no quick changes from day to night, or sequences which take place in moving vehicles. The television camera simply can't capture these scenes at present. Revolving stages will make some scenery shifts possible — but they cannot compete with movie films.

Although the war has temporarily stunted its growth, television has already rounded the corner and is a great source of interest and enjoyment to those thousands who pur-

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chased sets before their manufac-
ture was halted.

The nucleus of a television net-
work has been started. Programs
originating in New York are now
being broadcast to that city, to
Philadelphia, Albany, Troy and
Schenectady. Television broadcast-
ing facilities also exist in Chicago
and Los Angeles, and a television
station will begin operating from
Cincinnati as soon after the war as
equipment is available. Applications
for more than 80 new television sta-
tions have been filed with the Fed-
eral Communications Commission.
Inasmuch as television signals are
limited to a radius of about 50 miles,
a great many new stations are in-
dicated after the war, if television
is to blanket a large part of the
country.

Nor are commercial stations the
only ones determined to enter tele-
vision channels. At least four prom-
inent retailers have filed applications
for construction permits with the
FCC. They intend not only to tele-
cast fashion shows and similar pro-
grams, but to have receiving sets
installed, say, in lounges and lunch
counters for the entertainment of
their customers. Similarly, in several
large cities, the local Boards of Edu-
cation have applied for television
stations, to be used for supplemen-
tary teaching purposes. Industry,
too, can be expected to be a large
user of television - to get across its
public and employee relations mes-
sages. To this end, more than a score
of advertising agencies now have
television executives on their staffs,
and a number of corporations have
prepared movie shorts for television
use.

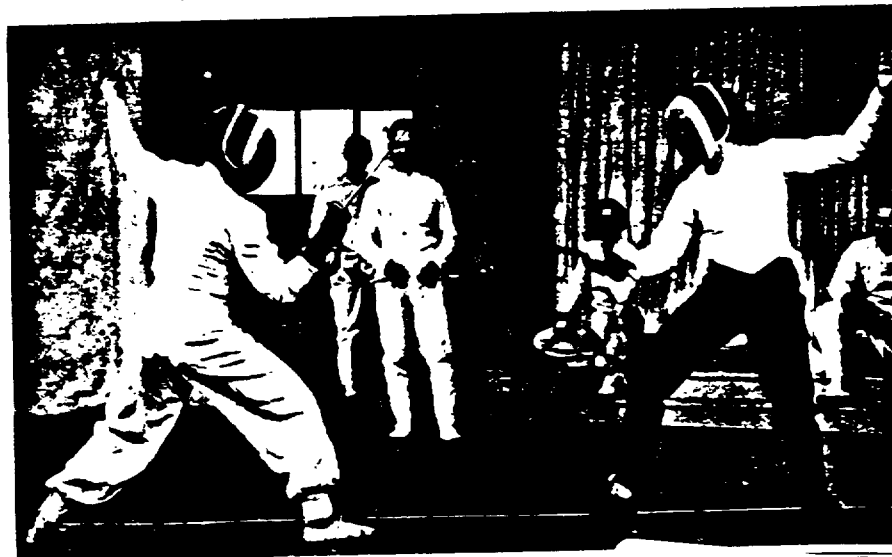
Today, with nine stations in five
cities in operation, television covers
an area inhabited by roughly 27 mil-
lion people living in 7 million
homes. Only a minute fraction of



News programs broadcast by television are popular
when illustrated with maps of the fighting zones



Television can broadcast many events not feasible in
radio — fencing matches, feats of magic, puppet shows



these, however, owns television receivers. Five years after the war, with 100 television stations in service, the potential audience would grow to 67 million people, it has been estimated.

But before the industry can reach that goal, a number of fundamental problems must be solved. Receivers by the million will have to be bought by the public. Continuous entertainment, to justify that public faith, must be provided. And at the same time, the cost of producing television programs must come down. This is the three-cornered riddle of television, in the opinion of informed observers.

Potential Home Market

Still, the industry is attacking those problems energetically, and has high hopes for the future. Take the cost of television receivers, for example.

If a television home receiver can be produced and sold for \$100, according to a survey, more than 60% of the people in the country would be willing to buy one at that price. Two of the largest manufacturers believe sets can be made to sell at that figure — and less — barring unforeseen changes in manufacturing costs.

In its lowest price range, a television set wouldn't be a lavish affair incorporating such extra features as FM and a phonograph combination — but it would reproduce telecasts better than ever before. More than that, broadcasters feel that it is the entertainment and educational value of telecasts that will sell receivers. And sets will probably be of two types, as they are now: one, a direct image unit, which shows the telecast pictures in the set; the other, a projection unit which flashes the image on a separate screen.

As to programs, it is quite likely

that the typical station after the war will telecast some combination of motion pictures, live talent shows, and on-the-spot news events. Motion pictures will certainly be a basic ingredient of television fare.

Full-length films already are a standard part of television programs. One of the chief assets of motion pictures is their ability to attract and hold audience attention. There isn't a chance of an actor fluffing a line and thereby ruining a carefully built dramatic effect. Since Hollywood's business is making talking pictures, film men feel that television is a natural market for them. Although the means employed in television are different from the movies, the end is the same: a talking picture.

Films have a number of advantages over live talent shows. Not the least is the fact that many prints can be made of a picture and distributed to television stations throughout the country. Foreign languages can be dubbed into film for broadcasts in foreign countries, so that the advertiser sponsoring a program can have the greatest coverage possible.

It is true that television can — and will — use a great many more moving pictures than up to now. But the big question to be settled is whether, and how, it will enter into competition with the movies. Lavish Hollywood spectacles are shown in movie houses for paid admissions. For television to offer the same entertainment — gratis — is out of the question in its present state of development. Perhaps television, at least in the first years after the war, will more or less supplement the film fare shown in theaters, offering a "different" kind of picture.

Yet, however these assorted problems are resolved, television is certain to come into its own after the war. It will usher in a new period

of entertainment for the American family — as breathtaking as the original introduction of radio. And will offer tremendous possibilities to the advertiser.

Showroom in Every Home

What will the advertiser get in return for his dollars? By 1955, television will provide an estimated 3 million showrooms in the home — compared with the 1,770,000 retail showrooms used to display the nation's merchandise before the war. "In television," says Thomas F. Joyce, of RCA, "the products can be displayed exactly as a sales manager wants them displayed. They can be demonstrated exactly as he wants them demonstrated. Every impression that the sales manager wants to make on the mind of a prospective buyer can be delivered by television — except one. It cannot put an order blank into the customer's hand. But — with the addition of facsimile to television — electronics may some day overcome this handicap."

OUR PICTURES

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Americans Build World's Longest Pipeline

Running all the way from Calcutta up the Brahmaputra Valley through Assam into North Burma, the world's longest pipeline is now delivering millions of gallons of gasoline for airplanes and motor vehicles at American installations in the North Burma-Assam combat area.

The line, which is longer than even the Big Inch in the United States, will eventually link India and the central Yunnan airfields in China. The construction has been under the direction of American army engineers.



THE BEST



THE BEST GASOLINE



THE BEST GASOLINE IS STILL FIGHTING

By ship, by train, by truck and by pipeline millions of gallons of America's finest gasoline are going to our fighting men.

This fighting gasoline is superior to anything ever sold to car owners. From both quantity and quality standpoints, it represents the best of the American petroleum industry's production, plus the lion's share of the Ethyl fluid being manufactured.

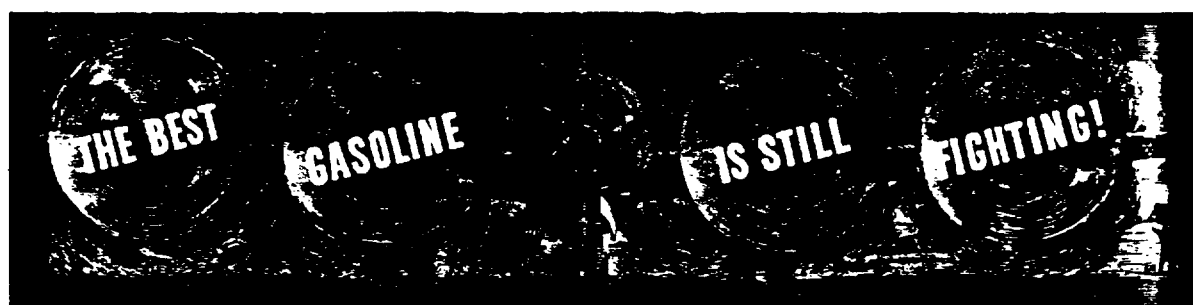
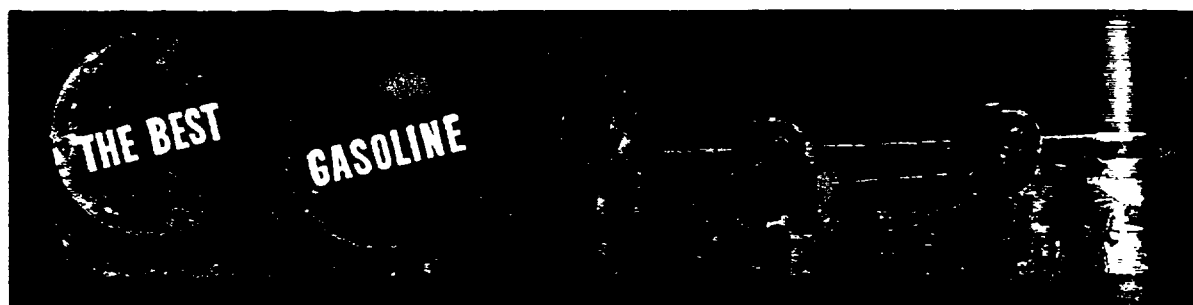
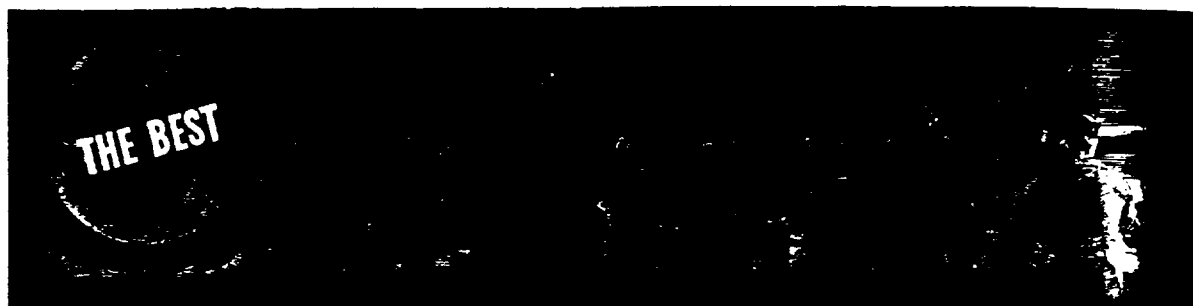
The best gasoline is still fighting—will continue to fight until the Army and Navy say it's safe to cut back on military production. Then you will get all the Ethyl you want and better Ethyl than ever before.

ETHYL IS A
TRADE MARK NAME



CHRYSLER BUILDING
NEW YORK 17, N. Y.

ETC 32062



A single B-29 carries more gasoline than the average motorist would use in ten normal years. What's more, every drop of this gasoline is of super-quality and improved with Ethyl fluid . . . so it isn't difficult to see why home-front supplies of gasoline are short on both quantity and quality.

In fact, there's only one thing that we know of that will greatly improve your chances of getting the gasoline you want. That's complete, final Victory. Only then can you expect unlimited quantities of high-quality, post-war gasoline. Only then can we promise you the Ethyl of the future, the Ethyl gasoline that will bring out the best performance of your car.

Ethyl
Corporation

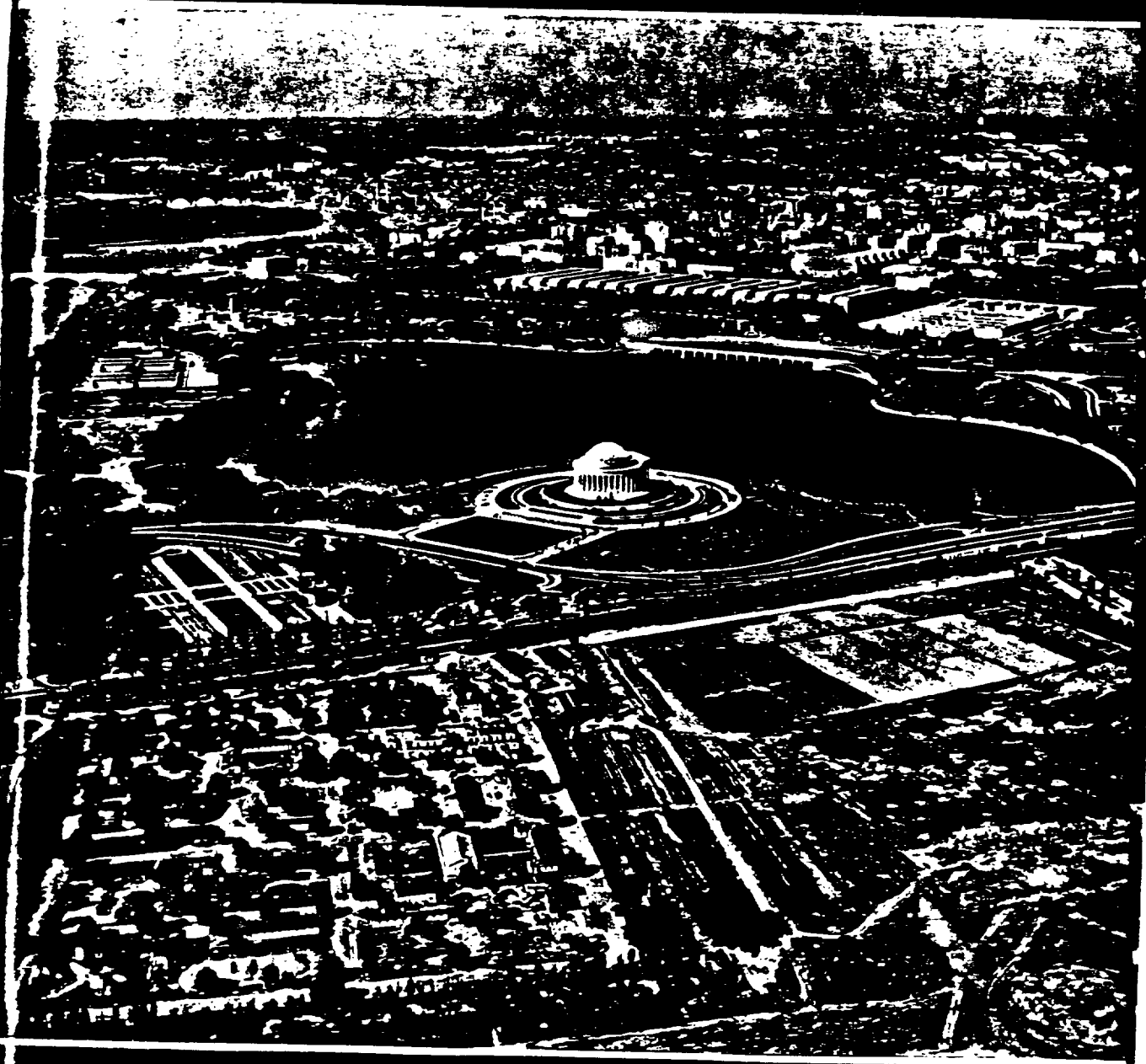


CHRYSLER BUILDING
NEW YORK 17, N. Y.

Ethyl is a TRADE MARK name

ETC 32063

ETHYL NEWS



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APRIL ★ 1945

ETC 32064



IN THE

ETHYL NEWS

APRIL 1945

To the list of Ethyl men and women who have given their services to the Government in the prosecution of the war is added the name of Dr. George Calingaert, director of chemical research.

Dr. Calingaert is now in Europe at the request of the U. S. Army Air Corps serving as an operations analyst for the United States Strategic Bombing Survey. He is a member of the rubber and chemical industries section headed by E. W. Pittman, of Inter-Chemical Corporation. Members of the Survey staff, who will be headquartered in London, will fan out to industrial centers in enemy territory to study at first hand how bombing raids over war plants can be made more effective in crippling the enemy's war effort. What the members of the staff learn and recommend will be put into use to speed up the end of the war in Europe and to increase the effectiveness of air raids over Japanese industrial war plants in the Pacific theatre.

Dr. Calingaert possesses talents and abilities which should make him of singular value to the staff of experts and the Air Corps. He speaks French, Flemish, Dutch, German and Italian and he has traveled extensively over much of the territory which has felt the fury of Allied bombings. His overseas assignment will last from three to six months.

EXPANSION AT BATON ROUGE

3

New plant at Baton Rouge will use a new process for production of ethyl chloride, one of the most important chemicals used in the manufacture of Ethyl fluid. The new process avoids use of grain alcohol or ethylene, both of which are presently in the shortage category.

NEW ROADS DOWN UNDER

6

A network of strategic highways built for war use holds great promise for Australia. A big increase in postwar automotive transportation there may open half the continent previously held back from development.

THE EDITOR IS A LADY

11

Talk about women taking over in the manpower shortage! Here's the story of a 21-year-old girl who edits and manages a weekly newspaper in North Baton Rouge, Louisiana — on her own!

"OLE MISS" DOES A JOB

12

The war has brought the Mississippi river into the spotlight again as a vital transportation artery. And oil is the Number One cargo.

PIPE THE ADMIRAL!

14

Deeply rooted shipboard courtesies in the Navy go back for generations. But with a war on, there've been some changes made . . . and the result is often amusing.

PORTRAIT OF A TINKERER

17

Many oil men know Leland V. Stanford as vice president of Sinclair Refining Co. What many people don't know is that he was one of the first to test Ethyl gasoline on the road. Here's how it happened.

LEAVE IT TO THE MERCHANT MARINES

19

Technically they're non-combatants — civilians in uniform — but the U. S. merchant fleet has suffered a higher casualty rate than any service. Here's the story of how officers of that fleet are trained for action at the Annapolis of the Merchant Marine.

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

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

Earle W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzalez, secretary

ETC 32065

EXPANSION AT BATON ROUGE

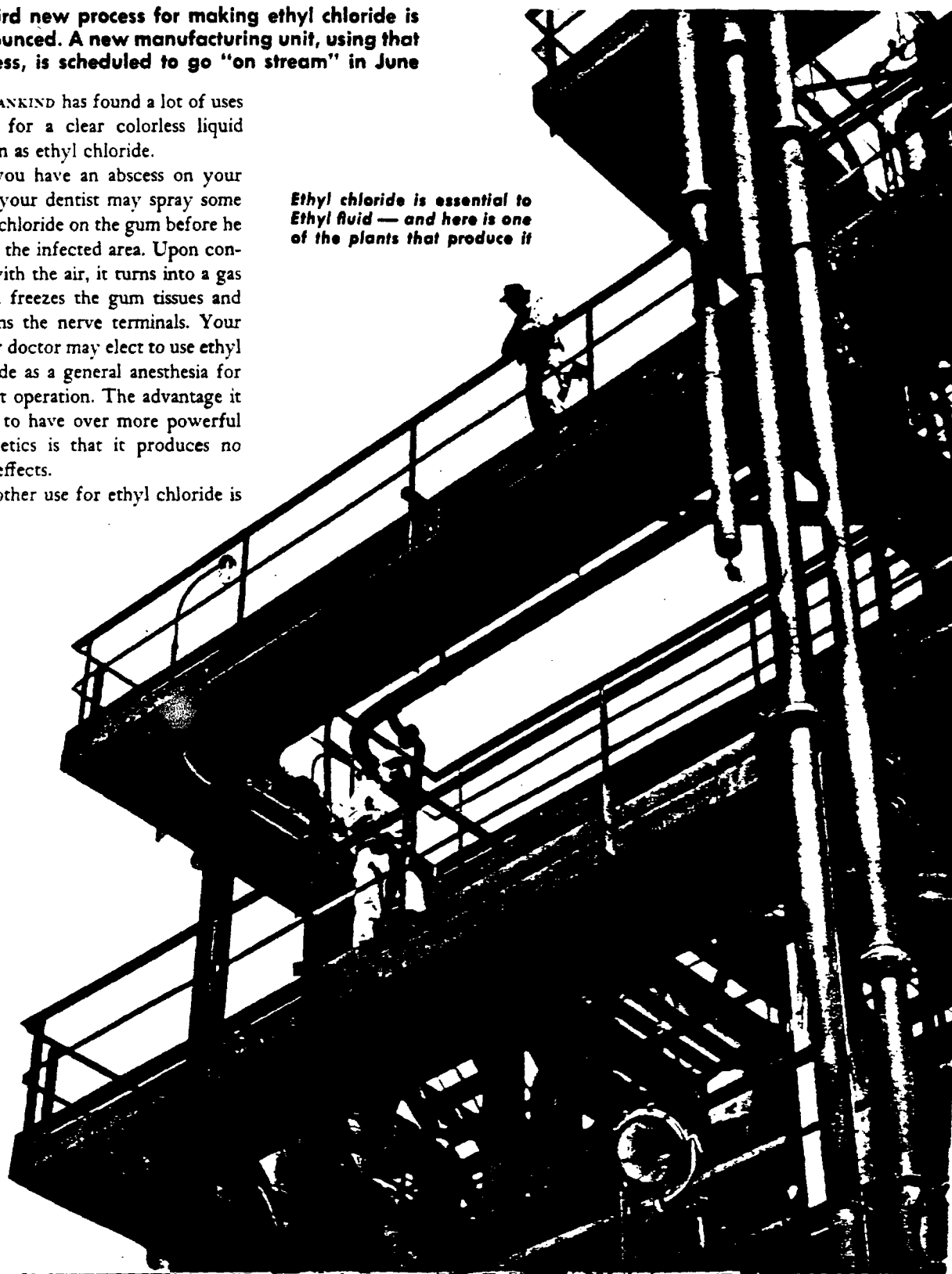
A third new process for making ethyl chloride is announced. A new manufacturing unit, using that process, is scheduled to go "on stream" in June

MANKIND has found a lot of uses for a clear colorless liquid known as ethyl chloride.

If you have an abscess on your gum, your dentist may spray some ethyl chloride on the gum before he lances the infected area. Upon contact with the air, it turns into a gas which freezes the gum tissues and deadens the nerve terminals. Your family doctor may elect to use ethyl chloride as a general anesthesia for a short operation. The advantage it seems to have over more powerful anesthetics is that it produces no after-effects.

Another use for ethyl chloride is

Ethyl chloride is essential to Ethyl fluid — and here is one of the plants that produce it



J. Y.

reary

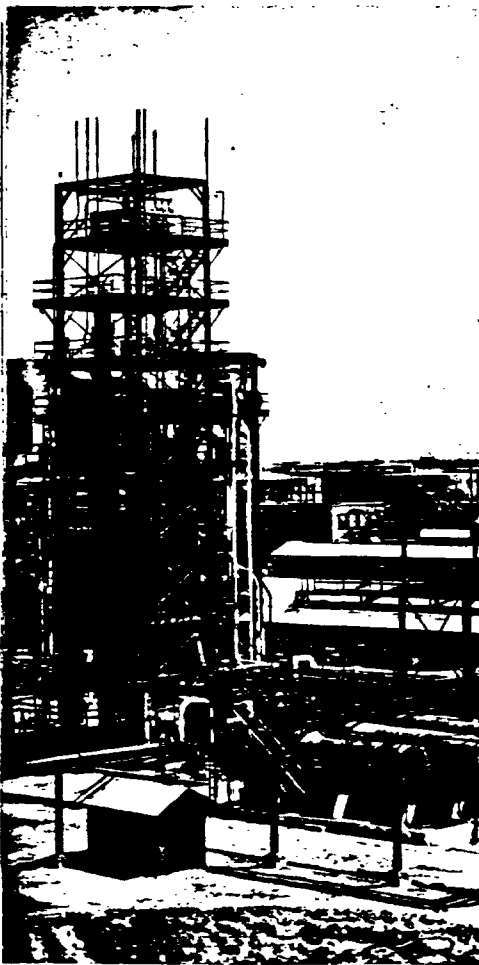
ETC 32066

in the manufacture of ethyl cellulose, the basis for certain plastics. It is used also as a catalyst in synthetic rubber manufacture, as a constituent of cognac essence and, sometimes, as a refrigerant.

More important than all these uses, however, is the place of ethyl chloride in the chemical chart for the manufacture of Ethyl fluid. An alloy of lead and sodium is combined with ethyl chloride to make tetraethyl lead, the ingredient which comprises about two-thirds of Ethyl fluid, and which does the work of taking out the "knock" in gasoline.

Because of the enormous requirements of ethyl chloride in the manufacture of tetraethyl lead, Ethyl Corporation is the world's largest producer and consumer of this

One of the Ethyl plants which make ethyl chloride by the ethylene process



chemical compound. Three ethyl chloride manufacturing units at our integrated Ethyl fluid plant in Baton Rouge, La., and two units at the Deepwater, N. J., plant produce from 80 to 90 per cent of the world's supply.

In the face of a serious shortage

Clinton W. Bond, resident manager for Ethyl Corp. at its Baton Rouge operations



of alcohol and ethylene — two compounds now used in producing ethyl chloride by means of two present processes — Ethyl Corporation's Manufacturing Department has designed a third and entirely new process to increase the production of ethyl chloride and thereby make possible the manufacture of more tetraethyl lead for Ethyl fluid. A new \$750,000 unit to make ethyl chloride by the new process is now being built at our Baton Rouge plant and will go "on stream," it is expected, in June of this year.

The new process yields ethyl chloride by reacting chlorine with waste products from one of the present ethyl chloride units at the Baton Rouge plant. Chlorine, a



John H. Schaefer, vice president of Ethyl Corp. in charge of manufacturing

greenish-yellow poisonous gas with suffocating odor, is produced by breaking salt electrically into its two parts — sodium and chlorine. The sodium produced by this electrolysis is used in the manufacture of tetraethyl lead after it is combined with metallic lead to form a lead-sodium alloy.

When the new unit is in operation there will be three distinctively different processes employed at Baton Rouge to make ethyl chloride.

The two processes now used are based on (1) the hydrochlorination of alcohol, known as the Frei process, and (2) the hydrochlorination of ethylene, known as the ELA process. (ELA stood for Ethyl Louisiana on the original blueprints and the abbreviation has stuck to the process as a name.)

In the Frei process, ethyl alcohol vapor and hydrochloric acid combine in the presence of a catalyst to form ethyl chloride and water.

In the ELA process, ethylene gas is mixed with hydrogen chloride gas in the presence of a catalyst. The two gases are first passed through a reactor where the hydrochlorination takes place. Later they pass through

a "flash drum" which distills off the lighter ethyl chloride fractions, leaving the heavier polymer fractions. The ethyl chloride is then purified by fractionation. The first of two units using the ethylene process was built in 1939 and represented the first commercial development of this method of manufacturing ethyl chloride.

The manufacture of ethyl chloride by Ethyl Corporation has created continuously difficult production problems as the wartime demands for Ethyl fluid have increased concurrently with rising demands for raw materials used in making ethyl chloride.

Take chlorine for instance. Prior to the war, all the chlorine obtained from the electrolysis of salt was converted to hydrogen chloride for use in the manufacture of ethyl chloride, and this supply was supplemented by additional chlorine purchases from outside sources.

But the war brought on a twin dilemma. On the one hand, supplies of chlorine were growing increasingly scarce, due to the intense pressure of wartime demands. On the other hand, Ethyl was in need of increased supplies of chlorine for its own purposes. The problem was solved by several steps.

First, in 1941, sodium was overproduced — and the surplus amount placed in storage — in order to obtain more chlorine. This made it possible for Ethyl to produce the chlorine it needed for its own operations without further open market purchases.

This was of only temporary benefit, however. As nationwide supplies of chlorine became critically short, Ethyl Corporation embarked upon an expansion program, both at Baton Rouge and Deepwater, to substitute hydrochloric acid for chlorine in its process. While chlorine was scarce,

hydrochloric acid could be freely produced from sulphuric acid and common salt. A hydrochloric acid plant was completed at Baton Rouge in September 1943 with the result that the Ethyl Corporation thereby solved its own supply needs.

But then other raw materials, besides chlorine, became scarce as wartime uses increased. One of the earliest shortages occurred in ethyl alcohol, which is used in the production of butadiene for synthetic rubber, and used extensively in the manufacture of detonating powders. This immediate shortage was overcome by the construction of a second ethylene plant.

Later in the war, ethylene jumped on to the list of shortages, a scarcity that developed to a large extent because Ethyl was using more of it than ever before in its ELA units.

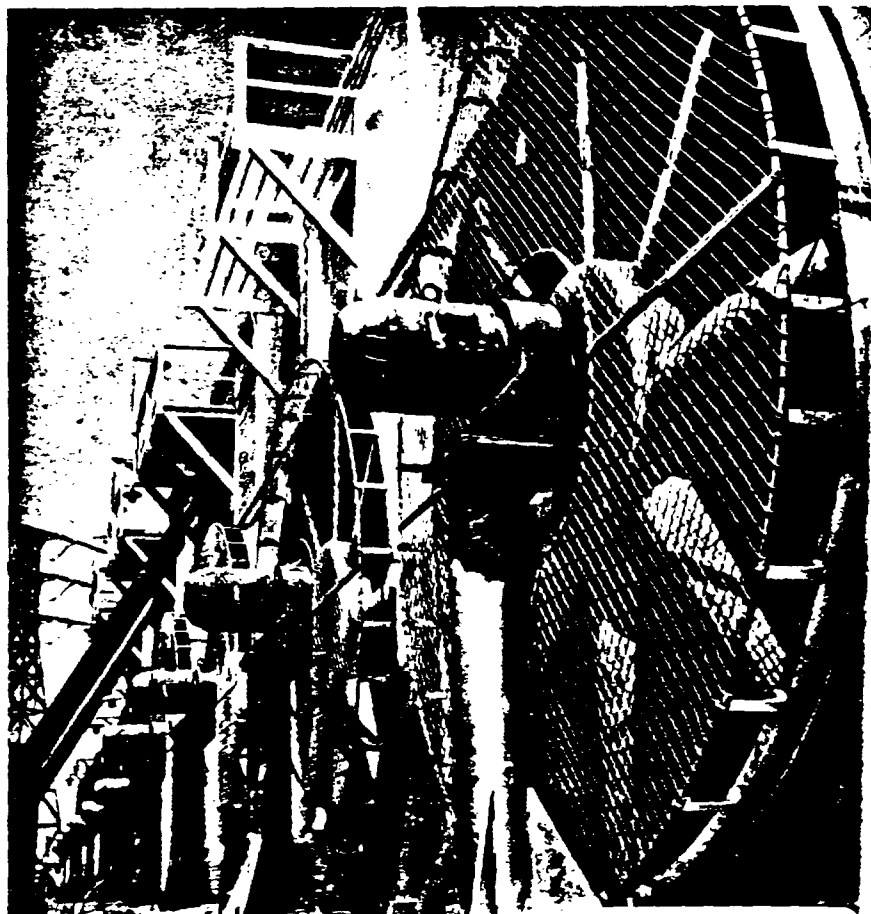
Having scraped the "bottom of

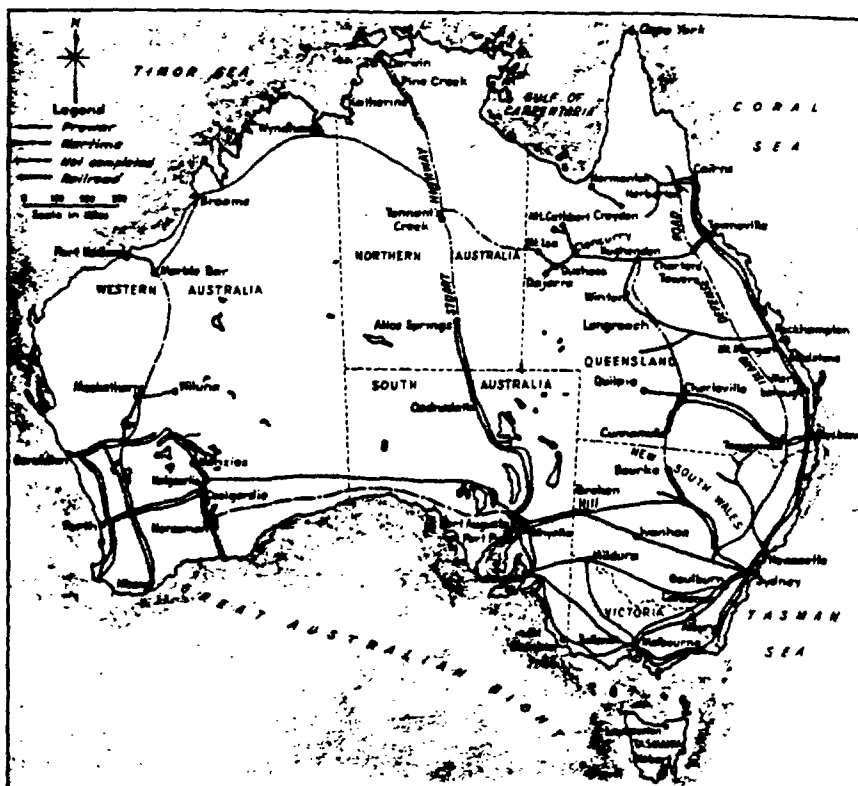
the barrel" of raw materials, Ethyl Corporation's Manufacturing Department began its search for new methods of producing ethyl chloride without using either alcohol or ethylene. Its efforts resulted in the construction of a small-scale pilot process plant to make use of waste products.

Process design for the full-scale plant now under construction was completed by the Manufacturing Department of Ethyl Corporation, and the engineering design was assigned to the Stone and Webster Engineering Corporation.

When the new ethyl chloride unit is in operation, Ethyl Corporation expects to meet fully all the increased demands for ethyl chloride in the manufacture of tetraethyl lead without any additional drain upon available supplies of alcohol or ethylene.

These fans are part of the cooling water system of the ethyl chloride operations at Baton Rouge





NEW ROADS DOWN UNDER

By John S. G. Shotwell

AUSTRALIA is like America in so many ways, even on a map. Take a map of either country and turn it upside down — you'll find it a reasonably good facsimile of the other. About the same size as the United States, although a little more square, Australia is 2,400 miles wide east and west and 2,000 miles long north and south.

But the lack of one thing has kept Australia from being a second United States. It has no Mississippi river. And instead of fertile farming country, fed by a central river system, there are vast reaches of dry land called the "outback." This, the bush country, is inhabited chiefly by nomadic bands of native aborigines (called "abos") and the kangaroo, cassowary and rabbit.

It is this "empty heart of Australia" — the Great Plateau, cover-

A network of strategic highways, built during the war, holds great postwar promise for Australia

ing practically half the continent — that has confined the great bulk of the population to the arable coastal fringes in the east and south. Due to this vast expanse of arid land, on the one hand, and the lack of internal transportation arteries, on the other, more than half of the country has been held back from development.

Far Corners Joined

But now, all that is being changed. A network of strategic highways has been built — for military purposes — which holds much promise for the land down under after the war. Tying all parts of the country

together — north and south and east and west — these roads presage a great and more uniform growth of Australia's economy.

These roads compare with the Alcan and Pan American highways of North America. But they are possibly of even greater importance because they open up more than a million-and-a-half square miles of almost virgin territory. By providing new interior transportation lanes, long the bottleneck to Australian progress, they will permit the development of the country's untapped reserves of strategic metals, will open up vast stretches of potential farming country for cultivation, and

will furnish swift routes to market for the great cattle and sheep stations (ranches) of the country.

The roads consist, first, of the Stuart Highway, which joins Darwin in the far north with Alice Springs, a thousand miles south.

The four-lane asphalt highway was built in the record time of 90 days, dating from the time of the first aerial survey until the first caravan of trucks rolled through. At Alice Springs, a railroad connects the highway to Adelaide and the industrial south. But the North-South Road, as it is also called, is being extended as a through road to Port Augusta, thus bringing the sparsely settled north within a few days' motor travel of the densely populated southeast.

About halfway between Darwin and Alice Springs is the second road, which juts off eastward to the mining center of Mt. Isa. There it connects by rail to Townsville, and thence down the coast to Brisbane, the capital of Queensland and Australia's third largest city. This is a three-lane asphalt highway which traverses the rich black soils of the Barkly Tableland, one of the richest pastoral districts in Australia, but one whose development has been retarded by lack of transportation. Now, the great cattle stations of the region will have a new quick route to market for their livestock.

The third road joins the Stuart Highway just north of the second. But instead of running east, this road travels westward to Wyndham and Broome on the northwest shores of the country. This road, while not as yet improved to the state of a highway, nevertheless furnishes much better transportation than existed from the fertile grazing lands of the Orde and the large cattle stations such as Victoria Downs.

The final road through the north

country, which connects with the aforementioned one, runs from Marble Bar in northwest Australia down across the desert to Meekatharra (where it connects by rail to the western and southern coasts). Although it crosses some of the most desolate of the bush country, it has already opened up extremely important mineral regions that have furnished basic chemicals for the war in the Pacific.

In other sections of Australia, two additional important highways have been built.

One is a strategic road running north from Brisbane to Cairns along the eastern coast. Routed along a mountain range, this "Inland Defence Road" was built primarily for military purposes. But as a result of it, the vast tropical hardwood forests of Queensland and the rich but inaccessible central valleys have now been opened up alike for industrial development and tourist travel.

Finally there is the so-called East-West Road across the southern part of Australia, which connects Port Augusta with Norseman in western



Building Australia's new roads was a formidable task, but they open up 1,500,000 sq. mi. of virgin land

A convoy passing through the North-South Road. Note the contrast between the road and adjacent countryside





An oil flotation tank at a gold mine. The discovery of gold in 1851 attracted immigrants by the thousands

Australia (and in turn with Perth on the west coast). Cutting across the Nullarbor ("No-Tree") Plain, the road improves existing rail transportation facilities between the rich wheat lands of western Australia and the eastern states.

These new highways are of great importance to Australia. But to catch their full significance, take a look at the country's topography.

Besides being shaped like the United States, Australia has a mountain range along its eastern coast not unlike our own Alleghenies. East and south of this Great Dividing range has the great bulk of the people perforce been clustered, because only in these coastal areas have there been sufficient water supplies the year round. During the last year, however, Australia has suffered from a great drought in the normally well-watered states of Victoria and New South Wales. West of the Great Dividing range is the Great Plateau — a vast expanse of arid land (with an average altitude of 1,000 feet) extending over half the entire continent.

Throughout this entire region — where there is less than one living

person to every eight square miles of land — there is very little rainfall (less than ten inches a year) over a good deal of it. Many rivers and lakes shown on maps actually exist only intermittently during the year — for a short time during the rainy seasons. The rest of the time they are dry, dusty beds.

The never-never land, however, is not entirely a desert, but rather a vast undulating plain broken with low hills and almost completely covered with vegetation. Its spinifex and Mitchell grass, mulga shrubs and salt bush make excellent cattle fodder, though the lack of surface water

during most of the year restricts the carrying capacity of the land.

The short intense rains of the wet season transform the lowlands into veritable quagmires, the dry river beds into raging torrents, and cover the whole country with a verdant carpet. The livestock on the huge northern stations quickly fatten on the rich forage and become ready for market. But unfortunately, their market is thousands of miles away over trails that become dry and dusty before the end is reached, and the once fine cattle arrive thin and stringy. They then require refattening but never regain their original quality.

Yet at the same time there are nine areas throughout Australia which hold huge stores of subterranean water. Created by surface rivers, these underground water sup-



plies are tapped by boring — in much the same way as a well is drilled for oil. The largest of these immense artesian areas underlies 600,000 square miles of land, mainly in Queensland and central Australia. Boring of these reserves has turned once arid soil into rich pastoral land.

Loading bales of wool for shipment to market. Australia is the world's largest wool producer



Australia's vast dry outback is the reason why most of its people have been confined to the coastal plains, particularly in the east. Of a total population of 7,000,000 people, more than 4,500,000 live in cities and towns. Two cities, Sydney and Melbourne, hold a third of the entire population.

Similarly with transportation. Australia has few inland waterways of any consequence and the railroads do not cross the barren center of the continent. In fact, most of the railways lie outside the dividing



Australia's steel industry centers around Newcastle



Forestry is an important industry in Australia. The eucalyptus (gum) tree is the most abundant

Australia's sheep stations are vast and sprawling



manpower and materials are available.

For the foregoing reasons, fully half of all Australia depends upon highways for transportation. And even in highways, Australia has been deficient. Take the densely populated eastern seaboard. Its four eastern states — Queensland, New South Wales, Victoria and South Australia — had only some half million miles of roads when the war began. Less than one-fifth were first class highways; the rest were county and development roads. Western Australia, encompassing a huge area, had fewer highways and was more dependent upon unimproved and semi-improved roads. The northern territories—which include the whole center of the continent — had only 300 miles of semi-improved roads. Mileages were impressive when considered in relation to population, but inadequate for the vast distances to be covered.

Thus it becomes obvious what the new network of highways opened up by military necessity holds for Australia's postwar future. Among other things, they will spur the industrialization of the land down under.

Wheat and wool long ago made Australia famous throughout the

mountain ranges. A further complicating factor is that five different gauges of track are used. This is because each Australian state, in building its railroad system in the last century, built it independent of any other state's; that's why a railroad trip from Cairns to Perth requires five different changes of trains. The war has focused attention on this, and gauges of main strategic railroads and industrial links are to be unified as soon as



The Editor is a Lady

THERE ISN'T anyone with printer's ink in his veins who doesn't at one time nourish a secret ambition to publish a small-town community newspaper. He could be a leg man, a police reporter, a feature writer, even an editor in his present job. But one day he's going to chuck the grind and grime of big city life to chronicle the doings of some small town or hamlet.

Yet publishing a small-town newspaper, for all its appeal, requires a prodigious amount of hard work. In the case of a "one-man paper," that man must be editor, reporter and columnist all in one; must do his own leg-work in chasing down stories; must read copy, write headlines, correct galley proofs and make up the page forms, and finally put the newspaper to bed. And if that isn't enough, he must frequently be his own advertising and business manager as well, soliciting advertisements and subscriptions, paying bills and adjusting complaints, and doing the thousand and one odd jobs that go into newspaper making.

Such seasoned versatility normally comes only after long years of newspaper experience. But down in North Baton Rouge, La., where an Ethyl Corporation manufacturing plant and other oil company refining facilities are located, a 21-year-old girl is holding down all the major jobs on the town's weekly newspaper, the *North Baton Rouge Journal*.

That girl is attractive Virginia L. Brueck, who for two years now has been editing the local newspaper.

Talk about women stepping into men's shoes! Here's a 21-year-old girl who edits a weekly newspaper — on her own

In all that time, she's had complete charge of the paper — and hasn't missed an issue.

These days, it's common enough for a girl to take over a man's job. But in Miss Brueck's case, she's replaced two men — twin brothers Rolfe and Ralph McCollister, who were respectively editor and business manager of the *Journal* before they entered the Army back in 1943.

Miss Brueck's association with the McCollister brothers in their publishing ventures dates back to the time when all three were still in their teens.

At that time, the neophyte publishers printed on their own hand-press a little advertising leaflet called "The Buyer's Guide"—and Virginia was hired to sell advertising space in the paper. Later, when this was expanded into a four-page newspaper, she turned to reporting for the paper. And then, when that paper evolved into the present *North Baton Rouge Journal*, she added the job of society reporter to her editorial duties.

Since 1943, however, when the McCollister twins entered the Army

(they are two of six brothers in service), Miss Brueck has had complete charge of the paper. As its editor and general factotum, she covers local events, writes general news stories and feature articles, serves as advertising manager, and generally is responsible for getting out the paper week after week. And the paper has continued to thrive under her direction — so much so that she has had to hire two girl assistants to help with the daily routine. Today, the *Journal* is an eight-page newspaper of news and general features, written for the families of North Baton Rouge, and with special emphasis on the local news of interest to any community.

Besides her manifold newspaper jobs, Miss Brueck takes a keen interest in community affairs, is secretary of the Baton Rouge Advertising Club and State President of the Young Women's Auxiliary of the Baptist Church of Louisiana. But newspaper editing appears to be her main interest. And now that she has jumped feet first into the field, she intends to make it her postwar career.



world. But contrary to popular impression, it is not alone the world's Number 1 sheep raiser and third greatest producer of wheat. It has also important manufacturing industries that take in 27,000 separate factories producing some \$2.5 billion worth of goods a year in normal times. Even in pre-war days, there were more Australians earning their living in industry than working as cow cockies (dairy farmers) or squatters (sheep farmers).

Australia's industrialization began with gold. Back in 1851, 62 years after the first white man arrived in the home of the kangaroo, gold was discovered in the Bathurst district of New South Wales. What the California gold rush did for the west coast of America, the Bathurst strike did for Australia. In a few years, the population doubled and redoubled. Adventurous immigrants from all over the world flocked into the country, hungry for gold.

The Bathurst strike was only the beginning. Even greater discoveries were made shortly thereafter. One was in Ballarat, once the richest gold field in the world; another was at the famous "Golden Mile" in Kalgoorlie, western Australia, where miners picked chunks of gold the

size of their fist off the ground. The Kalgoorlie mines are still the biggest Australian producers; the Golden Mile alone has yielded \$600 million in gold.

Following the discovery of gold, subsequent exploration led to the discovery of other valuable minerals, and by the time World War I came along, the mining of silver, lead, coal and copper was well established.

That war gave Australian industry its first big push, and World War II has carried it immensely further. Now, for the first time, the country is turning out completed tanks and aircraft of all types, even some engines. This is a great achievement for a country which in pre-war days had only assembly and body building plants. To help build her military highways, presses and machine tools for making construction machinery were lend-leased from the United States. Now, Australia is making trucks, tractors, bulldozers, carryalls and other earth-moving equipment. There is even considerable talk that Australia, after the war, may produce its own automobile.

Australia's new roads will greatly aid its manufacturing industries after the war — and lead to the creation of new ones. Further, it will promote the development of hitherto inaccessible deposits of strategic metals and chemicals. Already, the great "salt pans" of the northwest form the basis of a well established, heavy chemicals industry. Deposits of tungsten, vanadium, manganese and tin have been opened up and worked. New deposits of copper,

iron and zinc have been surveyed, and power sites investigated. All this will tend to make Australia more self-sufficient in industrial raw materials. Of the principal ones, she lacks only domestic supplies of oil and nickel.

Moreover, the new roads give the Australian cattle stations up north a new ready access to market for their herds. Instead of winding their way, mile by mile, to the distant stockyards, the cattle can be driven swiftly to market in their prime, or slaughtered locally and their dressed carcasses shipped in refrigerated trucks.

And perhaps of greatest importance, the new roads may promote the extensive irrigation of arid but otherwise fertile land in the northwest. Already, several truck farms have been started experimentally — one at Darwin and another at Whychiff in the "dead heart" of Australia. They have shown amazing results, and indicate the possibilities for upwards of a million square miles of undeveloped land in the tropical (northern) belt of Australia.

Thus, out of the war, Australia has forged a vastly important network of highways — one to which her postwar progress is tied.

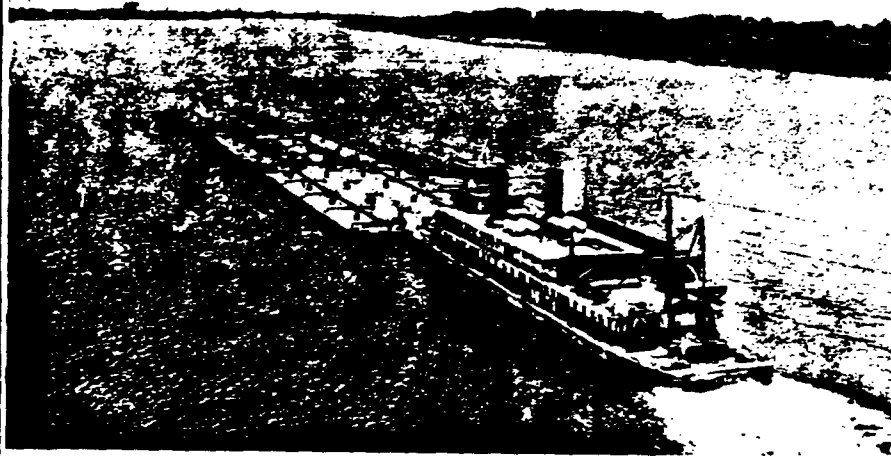
The Australian koala bears are loved the world over



The curious baobab (bottle) tree is found in Australia

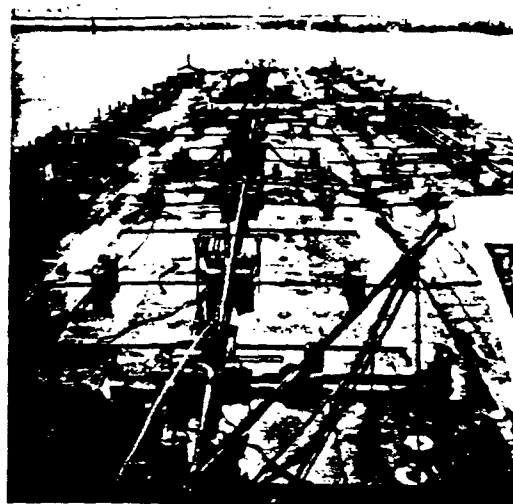
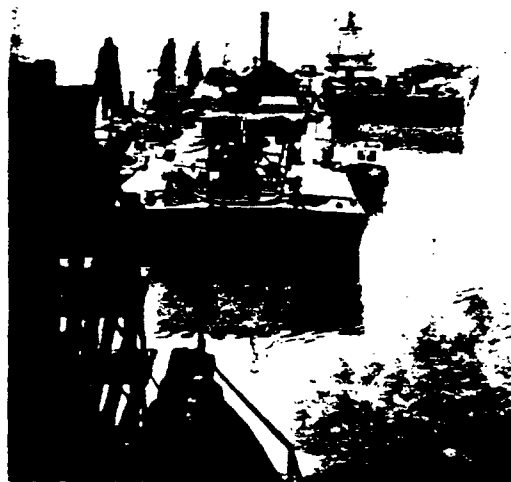
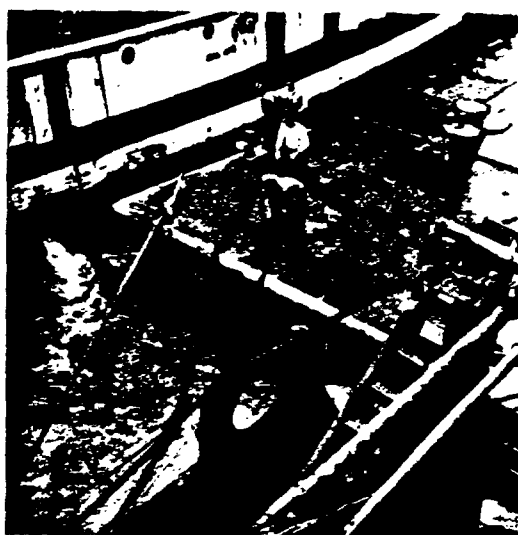


ETC 32074



"Ole

A towboat pushing its charge of oil barges along the river



Miss" DOES A JOB

The Mississippi comes into its own again as a vital transportation artery — and oil is its big wartime cargo



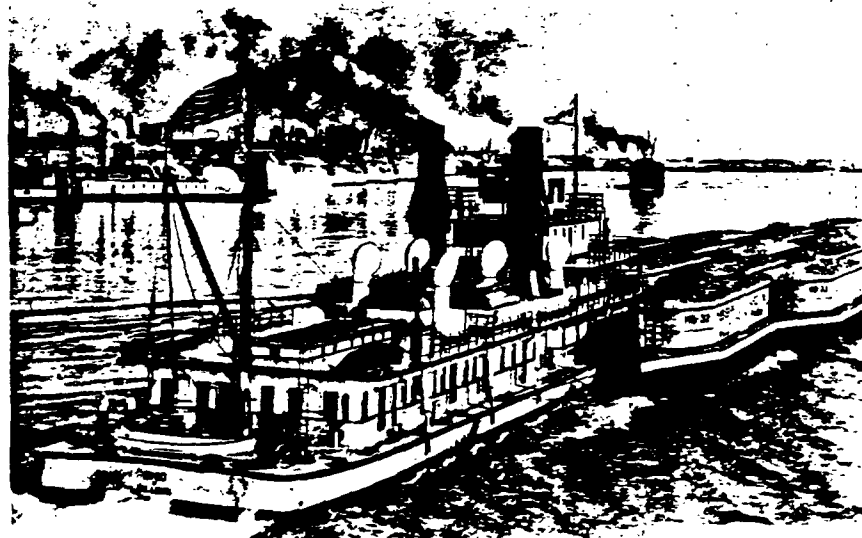
Above at a lightering dock is the Sprague, the world's largest towboat, which is owned by the Standard Oil Co. of N. J. Below, metering valves of the Plantation Pipe Line system at Baton Rouge

WITH the passing of the Spring thaws and accompanying floods, the upper reaches of the Mississippi again become navigable, the oil and general cargo trade moves northward from the southern streams . . . and 'Ole Miss' enters upon its fourth wartime year of service to the nation.

The war has lifted the Mississippi into a state of perhaps even greater importance than existed in the hey-day of the stern wheeler. And, interestingly enough, oil is the principal wartime cargo being carried up and down the river.

Most important port along the entire Mississippi river, of course, is New Orleans — the heart of the world's most extensive inland waterways system. At New Orleans, the Mississippi is connected with the east by the Intra-Coastal Canal.

Some 80 miles north of New Orleans is Baton Rouge, another important oil port, the home of Ethyl's Louisiana manufacturing operations, and the site of other oil and chemical company installations. Refined petroleum products from this area are shipped to the east, principally by the pipe line of the Plantation Pipe Line Co.



← Scenes along the Mississippi, busy at its wartime job of transporting oil



Pipe the Admiral!

by John A. Thomas*
Lieutenant, USNR

WHEN WAR and traditions meet head on, there's generally a little give and take. But more often than not, war does the giving and the traditions just take it. It's like that old saw about the man who learned the secret of getting along with his wife. "We compromise," he said. "We always do things her way."

The Navy has a similar realism in wartime, despite the fact that it is deeply rooted in traditions and ceremonies that go back through the years. Somehow, shipboard has always lent itself to more colorful forms of ceremony than has dry land, and as a result many naval customs have a quaint and gaudy picturesqueness about them.

But both afloat and ashore, Navy customs and etiquette have changed during the war. The principles remain, and many of the customs will undoubtedly be revived after the war. Meanwhile, there's been a little adjustment.

The greatest modifier, of course, is battle. Other influences are also having their effect. Modern inven-

The Navy's courtesies and traditions haven't walked the plank — but there have been some changes made!

tions have changed custom just as they have changed war. Many of the wartime conditions and restrictions that affect civilian life have also changed Navy customs ashore. And there are 84,000 women in the Navy today — a new development which is a welcome one, but was not exactly foreseen in the military courtesy books.

Wardroom Etiquette

You can get a fine view aboard any Navy battleship or aircraft carrier of what happens when custom runs up against battle conditions. One of the most tradition-bound sectors of a ship is its wardroom — the commissioned officers' mess and lounge room. Its customs and etiquette are handed down from one generation to the next. They are drilled into each midshipman long before he leaves Naval Academy for his first ship. Even the seating arrangements of the mess are strictly prescribed by Navy Regulations.

One of the long-established wardroom rules is: "Don't sit down to meals before the presiding officer does." If you were to follow that literally today, you'd be a mighty hungry man. Mealtime in war zones will often find your presiding officer, as well as yourself and your comrades, topside at battle stations. Once General Quarters is sounded and men prepare for possible encounter with an enemy, regular mealtimes go out the window.

Or take a similar wardroom rule: "Never be late for meals." The same conditions polish that one off, too. Many a Navy officer can testify that, far from attending wardroom meals on time, he has subsisted on sandwiches and coffee served topside whenever he could snatch a hasty bite.

Another tradition of the wardroom is "Don't talk shop continuously." That was a good sound rule — in peacetime. It took men's minds off their work, provided relaxation,

*The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.



directed their talk toward subjects of wider interest. Today their reaction would be, "What else is there to talk about?" or "What's more important right now than that?"

Men who've spent months or years in the Pacific see no point in asking each other, "What new plays have you seen lately?" But they do want to know how the other guy made out on his mission, what sort of opposition the Nips put up, who did what to whom and who got the worst of it (preferably with gestures). Talking shop is their chance to exchange those odd bits of information and latest "dope" that widen a flyer's experience and make him more combat-wise.

Even the traditional seating arrangements of the mess have gone by the board. Navy regulations prescribe that the officers be assigned permanent seats at table, in order of rank, to right or left of the presiding officer (second ranking officer to the right, third to the left, etc.). The mess treasurer always took the seat opposite that of the presiding officer.

Not only have irregular meal-times and frequent General Quarters broken this up, but many ships now scatter their higher ranking

officers among several tables, instead of concentrating them where a single chance hit of torpedo, shell or bomb might wipe out all at once. On ships where eating is done in shifts, it is sometimes the custom to "cross section" rank among the various shifts, for the same reason.

They Carry Their Own

Navy customs ashore have undergone similar changes during the last few years. It used to be strictly *verboden* for an officer to be seen carrying bundles. That was in the days before it became patriotic, not to say downright necessary, to "carry your own." Any Navy officer these days who wants to get stuffy about carrying his laundry home had better develop some way of teaching it to walk home by itself. Otherwise he is likely to wind up with his dignity intact but his linen missing.

Both military men and civilians (which, incidentally, is what 90% of us were before we put on uniforms) have long observed the custom of taking off the hat, or skimmer, in elevators when ladies were present. City life, with its impersonal hotel and skyscraper elevators, had already started to put the skids

under this ancient courtesy. War-time, with its jam-packed elevators, put the finishing touch on it for a while when it became obvious that raising your hand to take off your hat was (a) a difficult maneuver at best, (b) took up too much room, and (c) was likely to put some unoffending passenger's eye out. Some elevators now have signs pleading with you *not* to take your hat off.

Incidentally, if you see a Navy man talking to a lady in the street with his cap on, that's not forgetfulness — it's official custom. Strictly speaking, officers and men do not uncover in the open except for divine worship, funerals and other religious ceremonies.

Nor do they tip their hats to ladies. They salute. The military salute is regarded as the traditional mark and privilege of the military man, and has been ever since the custom of tipping the hat or touching the bill of the cap went out as a form of salute. No avoidance of courtesy, the hand salute is the highest honor that servicemen can pay their national colors or their commander-in-chief.

There was a time when a Navy officer could whip off a pretty snappy sword salute, but the war put an end to that, too. On the 15th of October, 1942, the Secretary of the Navy abolished the sword as a part of the uniform of Navy, Marine Corps or Coast Guard. Although it was the traditional symbol of authority, and man's most-used weapon for thousands of years, the sword became one of the early casualties of this war and went the way of all flash. Other formal Navy customs, such as the making of formal social calls and the leaving of visiting cards, are also more or less in abeyance during wartime, although they will probably become a part of peacetime etiquette again.



One modern development which the old traditions didn't foresee was the radio. According to Navy Regulations, all officers and men must come to attention "whenever the national anthem is played." You can probably visualize the effect on crowded city streets if all uniformed personnel did that whenever a radio store happened to pick up a broadcast of the national anthem. The rule, fortunately, is now interpreted to include only actual playing on the spot (unless you are present at a public gathering where the playing of the anthem is broadcast as part of the ceremony).

When women became part of the Navy, some complications of courtesy came in with them. The relationship of seniors and juniors in the military world is the foundation of military courtesy, and hinges on strict observance of precedence. But courtesy to women was also a pretty old habit, and it would have been possible to run into some amusing "After you, Alphonse" situations if people had to stop at every doorway and figure who should go through first.

Since running a Navy was a military job and not a social one, the solution was military. Waves had been accepted into the Navy; they

would follow the same rules as everyone else. Be it said to the credit of the Waves, that's the way they themselves want it, too.

However, how about social occasions, as opposed to military? Does a senior officer, for instance, take the inside position when walking with a Wave, and stalk through doors first, as military rules would dictate? Or does he yield such courtesies to the woman? Common sense solved that one nicely, too. The decision: on social occasions, follow social custom. Dinner - and - the - movies, it was agreed, is no place for rank.

While modern conditions have thus changed some customs, there are other examples where the tradition lives on long after the apparent need for it has disappeared. Take the colorful custom of "tending the side," for instance - that nautical courtesy by which visitors entitled to honors are piped over the side by a boatswain and a certain number of side boys, depending upon the rank or official status of the visitor.

In the days of sail, it was customary to hold conferences on the flagships, and sometimes the weather necessitated hoisting the visiting officer aboard in a boatswain's chair. The bosun used his pipe as a signal,

first to blow "hoist away" and then, to stop, "avast heaving."

Members of the crew did the hoisting, and from their aid in tending the side, the custom grew of having a certain number of men in attendance. The sails and the original custom are gone, but the bosun's pipe and the side boys still survive, and it is still done as a courtesy even though the situation that originally created it is long since gone.

That fine line between a functional act and a courteous one is sometimes not too easy to discern, which is perhaps how we once acquired one of our most famous Pacific possessions. Not so very long ago, climaxing a year of offensives that had carried them 4,000 miles across the Pacific, our Central Pacific forces swarmed ashore on Guam to retake from the Japs the first American territory they had conquered from us in this war. Our original 1898 "conquest" of Guam, however, was a good deal less costly and considerably more amusing, thanks to a slight confusion of naval etiquette.

When the Spanish-American War broke out, an American expeditionary force was sent to the Philippines. It stopped at Hawaii en route and then continued on to the Spanish-owned island of Guam. The Navy cruiser *Charleston*, which was convoying the expedition, anchored off Guam and fired a few shots.

This brought an unexpected apology from the Spanish commander (who did not know that war had been declared). He had heard the American "salute" but would they be so good as to forgive him? A shortage of ammunition prevented his returning it!

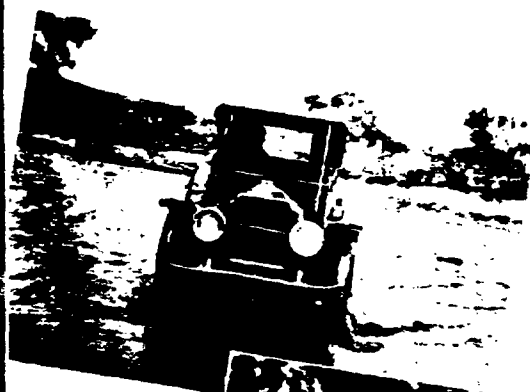
P.S. We got the island. And who says military courtesy doesn't have its uses?





Leland V. Stanford as he is today

Step up and meet Leland V. Stanford, vice president of Sinclair Refining — and one of the first road testers of Ethyl gasoline



Portrait of a TINKERER

LELAND V. STANFORD, vice-president of the Sinclair Refining Company, is a tinkerer. And being a tinkerer with few opportunities to work at it, he is a man with a suppressed ambition.

When he gets time, he says, he is going to build his own automobile engine. And like many a full-time automotive engineer, he is going to mount it in the rear of the chassis and take advantage of all the available power in the driving shaft.

Mr. Stanford has been in the petroleum business all his life. He cut his eye-teeth on a "go-devil" when he shot his first well in 1903, near his home town of Independence,

Kansas, in the center of the first big oil-producing area in the country. And ever since his roustabout days in the producing end of the business he has had a yen to take things apart and put them together again — with a few Stanfordinized refinements.

He is something of a pioneer, too. He believes he was the first intrepid adventurer to cross the Rocky Mountains in an automobile, a revolutionary event in 1910, that marked a milestone in automotive history. He did it in a Stoddard-Dayton, and to make the trip he was equipped with tackle, chains, towing rope, and canvas (for extraction from mud-holes and sand), and all the other

An intrepid adventure in those days was Mr. Stanford's trip across the Rockies in 1910. He is at the right in lower photo

accessories a well-prepared adventurer would take along on such an arduous journey over mountain trails and through forbidding passes.

And because he is a tinkerer, there is one experience in Mr. Stanford's life that is of special interest to the Ethyl Corporation. He was one of the first road testers of Ethyl gasoline.

It happened this way: At about the time the Sinclair Refining Company purchased the Union Petro-

leum Company at Philadelphia, the late W.E. Perdeu of Union, a prominent figure in the petroleum industry, received a confidential letter from his friend, the late Thomas Midgley, Jr., asking him to try out a sample of the tetraethyl lead which Midgley had developed as an additive to gasoline to increase power and eliminate knock.

Mr. Perdeu knew this was right down Mr. Stanford's alley. He secured Mr. Stanford's ready consent to make the test, and arranged to have Mr. Midgley send a small bottle of Ethyl fluid to Mr. Stanford.

Accompanying the precious bottle of Ethyl fluid was a letter giving definite instructions as to how many drops were to be added to a gallon of straight gasoline, but leaving it to Mr. Stanford to work out just how the test would be made.

Mr. Stanford owned a Nash touring car equipped with a Boyce motormeter. Being the tinkerer he is, he had an auxiliary one-gallon tank made and mounted on the car to contain the leaded gasoline.

He selected a road in Fairmount Park running along the Schuylkill River in Philadelphia. At the end of a 200-yard stretch of level road there was an abrupt turn up a steep hill. To get as accurate a test as possible, he had the car thoroughly warmed up and then stopped the motor. The carburetor was connected with the gasoline tank containing regular (California grade) gasoline. He measured off a distance of 200 yards from the turn on the level stretch of road, stopped the car, put it in high gear, and anchored the hand throttle at a fixed position, approximately half open. Starting the car in high gear, he went along the 200 yards of level road and made the turn up the hill, allowing the car to run until it stopped. The motor, Mr. Stanford reports, "knocked perceptibly."

He marked off on the hill the exact spot where the car stopped on regular gasoline.

He then went back to the starting point on the level road, drained the gasoline from the carburetor, connected the auxiliary tank containing the Ethyl gasoline, and proceeded to make the road test in the identical way he had used regular gasoline.

More Power With Ethyl

To his astonishment, he reports, he went up the hill 50 yards farther than with the regular gasoline and the knocking "was almost entirely eliminated." To make sure there was no fluke to the test, he did it over and over again setting his throttle at fixed positions. And every time results were the same. "The car, when using the gasoline with Ethyl fluid," he reports, "showed a much superior performance."

His confidential report was sent on to Mr. Midgley by Mr. Perdeu, and later he was informed that his was one of the first road tests that

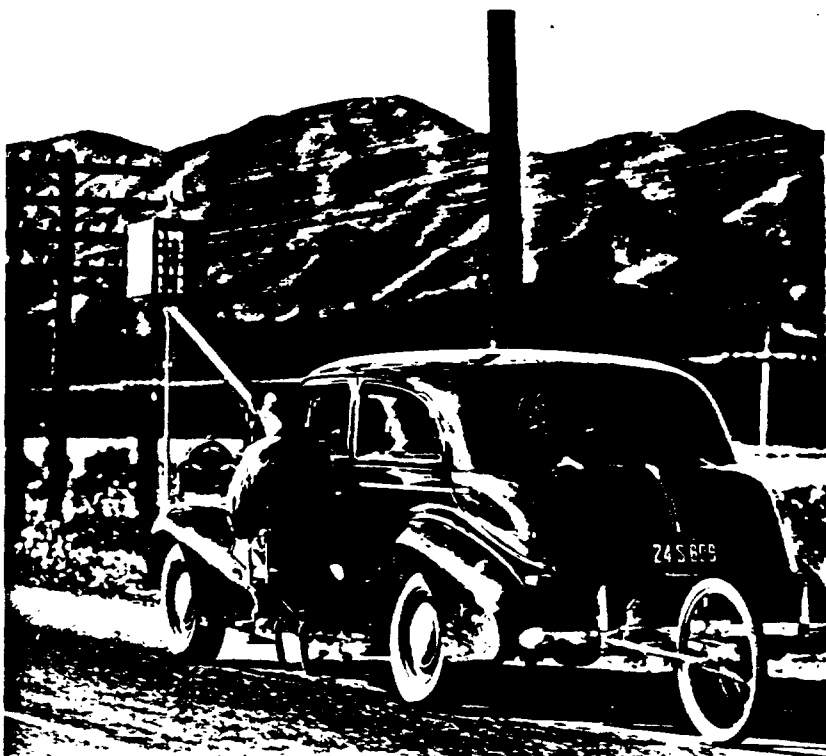
had been made with Ethyl gasoline.

On February 2, 1923, Ethyl gasoline went on sale for the first time at a small station in Dayton, Ohio.

Leland V. Stanford is a director of the Sinclair Oil Corporation and an assistant to Mr. H. F. Sinclair; and his brother, G. T. Stanford, who is chief counsel of the Sinclair Oil Corporation was one of the original organizers of the company. Both were boyhood friends of Harry F. Sinclair, and Leland joined the company at Chicago. For many years he has been actively identified in the export field in charge of Sinclair sales throughout the world. In addition, much of his time is also devoted to Sinclair crude production in various foreign countries.

As he turns a nostalgic eye toward colored maps of producing areas abroad, he probably cherishes the desire to don a pair of dirty overalls and do some tinkering around a drilling rig. And do a bit of day-dreaming about his home-made automobile engine.

Road testing of Ethyl gasoline has developed into an elaborate science since the days when Leland Stanford first tried it out. Below, a road test at Ethyl's San Bernardino, Cal. research laboratory



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LEAVE IT TO THE *Merchant* MARINES

By North Clarey, Jr.

Side by side with the Navy, in every theater of action, serve the officers of our cargo fleets, trained at the Annapolis of the Merchant Marine

YOUNG ED O'HARA, the engine-room Cadet-Midshipman, was only nineteen when it happened. That was three Septembers ago. A little American freighter was feeling its way through the fog one morning, when a pair of Axis surface raiders cut through the mist and opened fire. One of them had heavy guns; the other swept in close and sprayed machine-gun fire over the American's decks for a half-hour. Gamely the Navy gun crew, in their exposed gun tub aft, answered shot for shot with the raiders.

Then a horrible slamming, ringing explosion staggered the little freighter. Bitter yellow-white smoke drifted over her. A direct hit had exploded the ammunition near the after gun. The gun itself stopped firing.

Young Ed O'Hara looked aft. The gun did not resume firing. A sad little wisp of smoke curled up from the muzzle.

Jamming his hat down, he dodged and twisted through the debris on

the after deck to the gun platform. The heavy gun tub was battered and torn. The gun was damaged. Her crew, the Navy boys, were dead or dying.

But there was still some ammunition in the readybox. The Cadet-Midshipman swung open the hot breech and slid a shell home. By hand he cranked the wounded gun around until she bore on one of the raiders, and fired. It was a hit. He fired again, then again. He got five shots off, scoring direct hits near the waterline, before he crumpled and dropped to the deck next to the Navy boys.

Soon afterwards his ship went down. Her masts had been shot away, her boilers exploded and engines destroyed; she was blazing from bow to stern. But those of the crew who got away in a lifeboat under cover of O'Hara's fire saw one of the raiders go under before their ship did.

Now Ed O'Hara was not a gunnery officer. He was not even an

officer — just a student, a Cadet-Midshipman — but he had studied gunnery as well as engineering for three months at the U. S. Merchant Marine Cadet Basic School, San Mateo, California, before he began his tour of sea duty as a Cadet-Midshipman. For his prompt and gallant action that September morning they gave him, posthumously, the highest decoration of the Merchant Marine — the Distinguished Service Medal.

An even more impressive memorial has been created, however, in O'Hara Hall — a handsome and spacious new gymnasium for the 2,400 cadets at the U. S. Merchant Marine Academy in Kings Point, N.Y. Here, on a rolling lawn that rises from the south shore of Long Island Sound, the government has built a training institution for future officers in the growing American merchant marine. Nearly two dozen fine new buildings have been erected; there are some 40 in all. The grounds, about 60 acres, include the former estate of Walter

P. Chrysler, together with the property of famous ex-neighbors of his such as Nicholas Schenck, movie mogul, and Tom Meighan, star of the silent films.

Kings Point is the Merchant Marine equivalent of Annapolis, West Point or the Coast Guard Academy. Young men from 17 to 23 are given a 24-month course (of which half a year or more is spent on cargo vessels or tankers at sea), which trains them as Third Mates or Third Assistant Engineers. To qualify, they must pass the standard government examinations for these licenses. Upon graduation, each cadet is also given the rank of Ensign in the U. S. Maritime Service and commissioned as Ensign (inactive) in the U. S. Naval Reserve.

Because the Cadet-Midshipmen are being trained as naval reserve officers at the same time they learn merchant seamanship, they are designated as "Cadet-Midshipmen" of the U. S. Merchant Marine Cadet Corps. This leads to all sorts of confusion. People get them mixed up with the Marine Corps, the Navy, and whatnot.

Just what is their status, then? Where do they fit into the over-all picture, especially in relation to the armed forces?

In a few words, the American Merchant Marine is a vast, non-combatant fleet of cargo and passenger ships, tankers, refrigerated food vessels, lumber schooners, tugs and so on, which in peacetime is owned by many private, independent shipping companies. In this war the government has taken over all vessels under the American flag, and operates them through the War Shipping Administration. Many ships, of course, were taken over directly by the Navy or Army to be used as fleet auxiliaries or transports.

Now, qualified officers of these merchant marine vessels may join the U. S. Maritime Service, a unit of the training organization of the War Shipping Administration. Membership allows them, but does not compel them, to wear uniforms and insignia which are enough like those of the Coast Guard, Navy, or Army Transport Service to confuse non-seafaring folk. Even though they wear uniforms, merchant seamen are not, contrary to many people's ideas, in the armed forces. (Sailors of draft age *are* exempt from selective service as long as they follow the sea.) Technically, merchant mariners are civilians, but since their work involves close cooperation with the armed forces in combat areas (they form the bulk of every invasion, for instance) they are given special "service ribbons" of their own — different in design from those worn by soldiers and sailors, but a testimony to the same combat experience.

Highest Casualty Rate

Here's something you probably didn't know. These "civilian" sailors have lost — according to *Yank*, the Army newspaper — *ten times* as many men out of every hundred as any of the armed services! Today our expanded Navy and improved convoy techniques have beaten down the sub-and-plane menace, but there was an awful time, not so many months back, when each darkened ship that put out to sea was literally starting a run through an unholy gantlet.

It was in those early days that Ed O'Hara, and over a hundred fellow Cadet-Midshipmen still in training, gave their young lives in the fight to get our food and our weapons across the oceans.

In charge of the Academy that trains these Cadet-Midshipmen is a

Commodore in the Navy who had distinguished himself as a merchant marine shipmaster before the war — Giles C. Stedman, former master of such U. S. superliners as the *America* and *Washington*. Commodore Stedman, a Naval Reserve officer, wears the coveted Navy Cross for having rescued 22 of the crew from the sinking *Exeter City* in 1933. And back in 1925, as Chief Officer of the old *President Harding*, he personally ran a lifeboat through a 75-mile gale to rescue 28 lives from the foundering Italian liner *Ignazio Florio* — a feat which won him a silver medal from Italy. He knows the sea, and makes sure that a salty brand of seamanship is drilled into his student officers.

These lads are drawn from every state in the Union. They are first given a four-months' course in U. S. Merchant Marine Cadet Basic Schools at San Mateo, California, Pass Christian, Mississippi, or at Kings Point itself. They are then shipped out as Cadet-Midshipmen on merchant vessels, either tanker or dry cargo ships, for at least six months — and if their boat happens to get stuck on a Pacific or Mediterranean "shuttle" assignment, they may be out well over a year.

Half of them are preparing to be deck officers, half of them engineering officers. About 1,500 cadets are sent out for training each year from the West Coast school, 900 from the Gulf school, and 750 from New York — better than 3,100 in all. One out of every three or four cadets is assigned to a tanker for training. From 750 to 1000 future officers are, at this moment, learning their profession with our tanker fleet.

This is a valuable part of their training, for it's the bedrock of experience on which all their book work is based. They work as one of the crew six hours each day, and

they work hard — scaling paint, chipping rust, outfitting the lifeboats; handling tools, tackle, ropes, mooring lines and monkey wrenches. Cadet-Midshipmen will help the mates supervise the stowage or cargo, help the engineers take apart and repair an ailing ice machine or dynamo. Deck Cadet-Midshipmen learn to shoot the sun with a sextant or an Axis raider with a 3" 50 gun, and they are taught visual signaling, first aid, rules of the road, and customs requirements. Engine-room Cadet-Midshipmen learn about the innards and the eccentricities of boilers, diesels, pumps, turbines, reciprocating engines, condensers, main bearings and butterfly nuts. Cadet-Midshipmen aboard tankers learn the special skills of topping off, trimming ship, or telling how many hours Number 4 starboard tank has to go by spitting into it. By the time they come back to Kings Point they have learned to work, think and act like seamen; to bear responsibility.

Textbook Study, Too

Aside from the six hours' physical work they do each day, Cadet-Midshipmen put in more than four additional hours on textbook study. This is a stiff assignment for youngsters on their own, but they always have before them the printed admonition of the Academy: *"The urgency of the war effort will impress worthy Cadet-Midshipmen with the necessity for more and harder work on their part. The unworthy ones will not be certified as graduates."*

And there's no fooling about that. One-third of each class is washed out before graduation day.

After their period at sea, all the Cadet-Midshipmen return for a twelve-month course at the Academy itself to complete their academic studies. They study Navigation, Communications, Naval

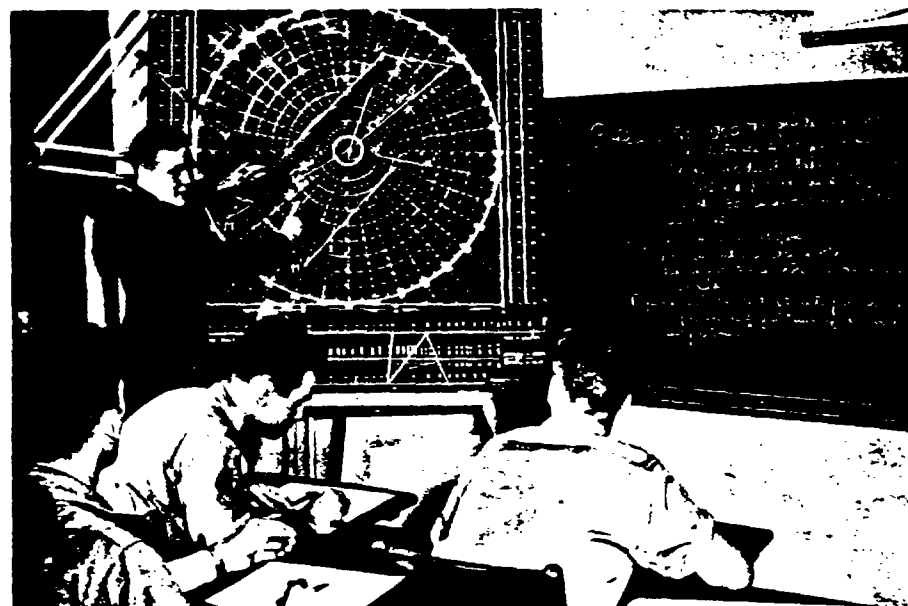


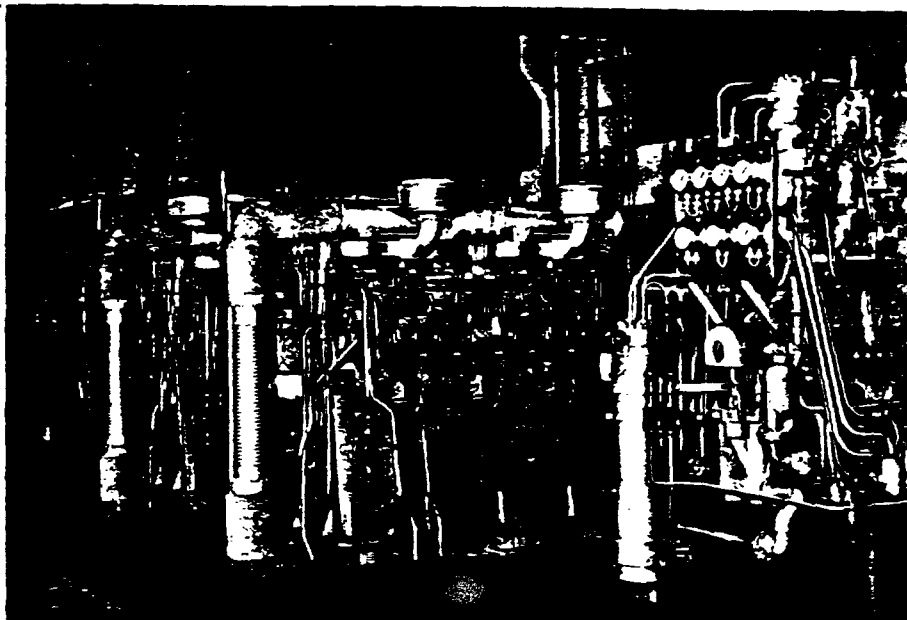
Every phase of seamanship, from handling a breeches buoy on down, is taught the men at the Merchant Marine Academy



Athletics round out the Cadet-Midshipmen's training at the Kings Point Academy, fit them for their strenuous jobs ahead.

Below, a class is initiated into the intricacies of a navigation chart. This and a host of related subjects are taught





The Merchant Marine Academy is completely equipped to teach our future officers every skill they need to know

Science, Seamanship, Cargo Handling, Steam and Diesel Engineering, and a host of related subjects. They drill in formation, learn more about guns and small arms, go on overnight lifeboat trips, work out in O'Hara gymnasium or on some of the Academy athletic teams. They go in for athletics with the same earnest purpose; just last January the wrestling team defeated Yale, 16-12, after Yale had won the nine previous matches in a row.

What lies ahead for them as officers? They will be well paid, not overpaid. It is impossible to say "a third mate will average so much a year," for wages vary with different companies, types of ships, cargoes carried, overtime pay, and so on. An important part of each check is from various bonuses paid for undergoing special hazards — carrying

gasoline or explosive cargoes, undergoing attack by submarine or airplane, sailing in waters designated as "combat areas."

Wages in themselves are good, but there is much to mention on the negative side of the picture too. What with vacations, transfers from one ship to another, time off to study and take examinations for advancement, or time ashore for illness, an officer or sailor will average only ten months of the year aboard ship — and he gets no pay for the other two. He is subject to all the withholding taxes and other income taxes of any civilian, without the special exemptions of the uniformed Navy sailors that ride the same ships he does. He receives no workman's compensation, no unemployment compensation. He rarely has a pension to look forward to. It's a funny

thing, but whenever a Navy officer and a merchant marine officer get to talking about their respective wages, each one winds up convinced that the other is better off.

At any rate, as far as the Cadet-Midshipmen are concerned, the big rush is not to earn, but to learn.

After the war is over the rushing tempo of Kings Point will slow down to a quiet, businesslike routine, and the hard-working young men will have more time for diversion or gaiety. The course will be expanded to cover four years. Instead of commissioning 250 to 280 cadets each month, that same number will graduate once a year. All the dormitory rooms will go on a two-man basis, with half the bunks removed; the enrollment will drop from 2400 to 1200 cadets.

And the impressive buildings, the handsome grounds and view will make a spacious, handsome *alma mater* for the coming officers of America's great peacetime merchant marine.

But the war is a long way from being won, and no one knows it more than these Cadet-Midshipmen — most of whom, being upper classmen, have spent at least a half year out in the thick of it. It is their own creed, more than that of the instructors, which has found its way into the expression: "*The urgency of our war effort will impress worthy Cadet-Midshipmen with the necessity for more and harder work on their part. The unworthy ones will not be certified...*"

OUR COVER: Pictured on this month's cover is the first aerial view of the Jefferson Memorial permitted since the start of the war. The memorial, one of the most beautiful in Washington, is a tribute to Jefferson's architectural tastes. The thirteenth of this month marks the 102nd anniversary of the birth of the author of the Declaration of Independence.

OUR PICTURES: Cover, Press Association; Pages 6-10, map and pictures courtesy Australian News and Information Bureau; Pages 11, 12 (except top) and 13 (except bottom), Ralph Pierson; Page 12 (top), courtesy Federal Barge Lines; Page 13 (bottom), Ewing Galloway; Pages 14-16, cartoons by Rodlow Willard; Pages 19-22, courtesy U.S. Merchant Marine Academy.

The Best Gasoline is still fighting!

*Rough impressions of gasoline's role
on the battle-fronts - based on actual
incidents and official photos.*

An American sergeant talks to three Chinese truck drivers near Myitkyina. The Chinese knew enough English to say "gasoline"—the one thing they need to keep their convoy rolling up the Stilwell road.



The Coast Guard rolls ashore in the Pacific. Drums of 100-octane aviation gasoline and 80-octane "all-purpose" fuel are rolled up on the beach to back up an American attack further inland.

Flying ambulance brings back Americans from the South Pacific. These men are inside a Skytrain en route to a U.S. Navy base hospital.



IT'S NOT DIFFICULT for the average American car-owner to see why the quantity of gasoline he can get must be limited . . . but he doesn't always understand why the quality of wartime gasoline should be lower.

The answer is simple enough. The best gasoline that American refiners can produce, improved with Ethyl fluid, "is still fighting." The result is that gasoline left over for civilians isn't up to par and can't be expected to bring out the full performance of modern high compression engines.

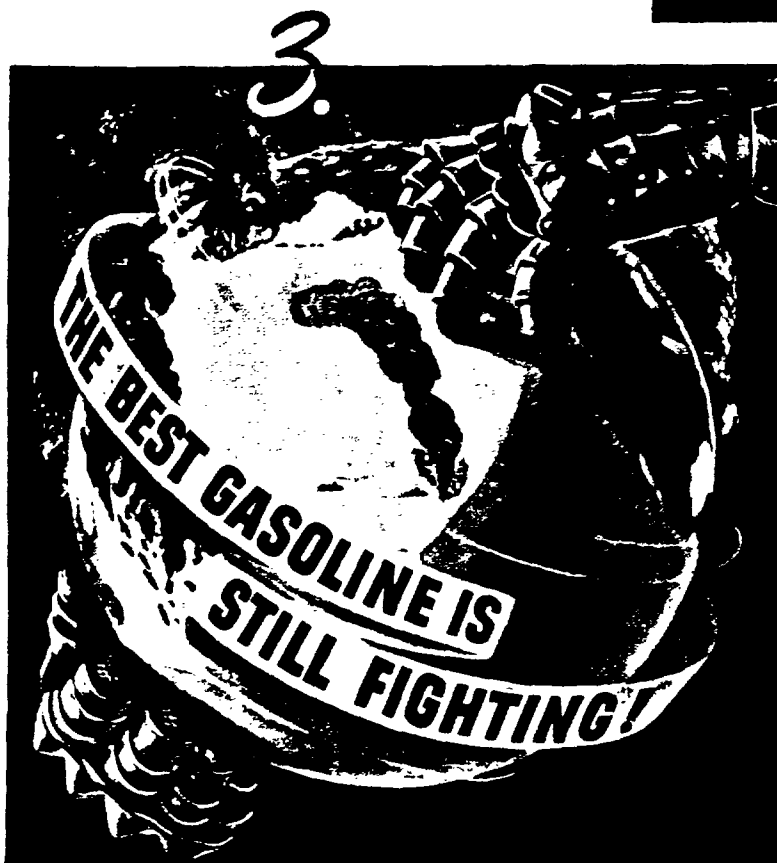
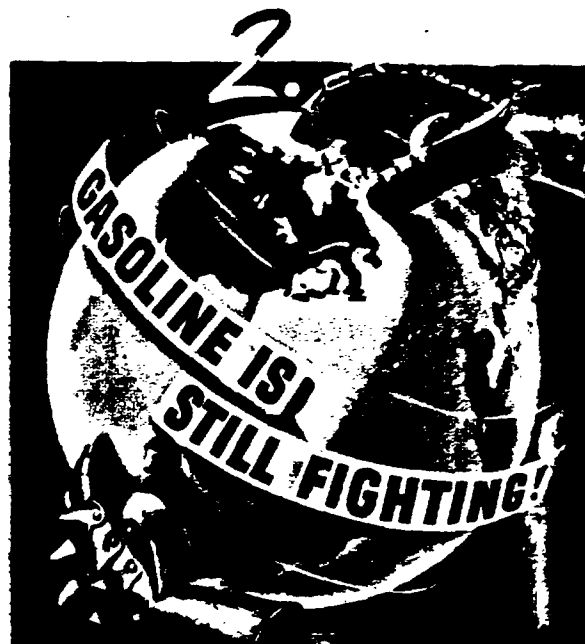


Ethyl is a trade mark name

Ethyl

CORPORATION

Chrysler Building
New York 17, N. Y.



RIGHT NOW the world's best gasoline — millions of gallons of it — is being shipped to fighting fronts all over the world. Our fighting men are getting the cream of the petroleum industry's production — and all they need.

But as long as America is fighting two wars — one in Europe and the other in Asia — home-front gasoline supplies must be limited both as to quantity and quality. Only complete, final Victory will bring car-owners the Ethyl gasoline they look forward to — the Ethyl that will bring out the top performance of any car.

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CORPORATION

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ETHIOPIAN NEWS



ETHIOPIAN NEWS

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IN THE

ETHYL NEWS

MAY 1945

Decorated by the British, French and American governments, Major F. D. ("Don") Williams, formerly of Ethyl's New York Division, has served with distinction in virtually every major campaign in the African and European theatres.

In 1942, he went along on the Dieppe raid, and was one of the few American Rangers to return unscathed. Later, he took part in the occupation of Madagascar, the French island off the coast of Africa. Next came the invasion of North Africa, where he saw action with the British First Army and later the British Eighth. Then came the landings on Pantelleria, Sicily, Salerno, Anzio, and Corsica—and raids on the coast of France when that country was still in German hands.

In the main invasion of Europe, Major Williams landed with a party on "Omaha Beach," Normandy. He last saw action in Holland, where he took part in the 82nd Airborne Division landing in that sector.

Major Williams has been wounded in action four times. He has been awarded the Victoria Cross by the British, the Croix de Guerre by the French, and the Purple Heart by this country. Now back in the United States, Major Williams is shortly returning to civilian life.

CBI LIFELINE

3

The greatest engineering achievement of its kind! That's what the CBI pipe line, nearing completion, has been called. But for a fuller understanding of its meaning to the CBI front — and of conditions in that theatre of action — here's an eyewitness report.

WHERE TO LIVE — AND LIKE IT!

7

Nearly everyone talks about that postwar home he is going to buy — but what about the community he will live in? The surrounding neighborhood is perhaps even more important than the house itself. Here, then, is a roundup of views on this important phase of postwar housing.

DRUMS OF WAR

10

More and more gasoline is being flown over the Hump into China — thanks to a new lightweight aluminum container. Besides its saving in dead weight, the new container has been found to be sturdier and safer than the former steel drums. Several oil companies, moreover, are testing it out for possible peacetime use.

"CAN DO" AT GUAM

12

Ten months ago, U. S. forces invaded Guam and wrested it from the Japs. Today, that island outpost has become one of our most vital Pacific bases. It even boasts a four-lane superhighway. Responsible for that accomplishment are the Seabees — the amazing "can do" boys of the Navy — who jump in to repair the wreckage even before the fighting is over.

IT'S RANK CONFUSION

14

To the average civilian, military titles are completely bewildering. But here's a suggestion how the conflicting ranks could be unscrambled and uniformity achieved among the services.

THE FREEZE ON FOODS

16

A gas station operated in conjunction with a frozen food locker plant? This is only one of the many interesting possibilities foreseen for the frozen foods industry after the war. Born only in the 1930's, the industry has since grown by leaps and bounds, today looks forward to a bright postwar future.

FOR THE BEST IN GASOLINE

20

In war as in peace, Ethyl's gasoline testing laboratories perform a highly useful service for the oil industry and motorists. That service means testing scores of gasoline samples daily, and providing a constant check on gasoline quality.

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

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

Earle W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzalez, secretary

The new Calcutta-Kunming pipeline ranks as one of the war's greatest feats

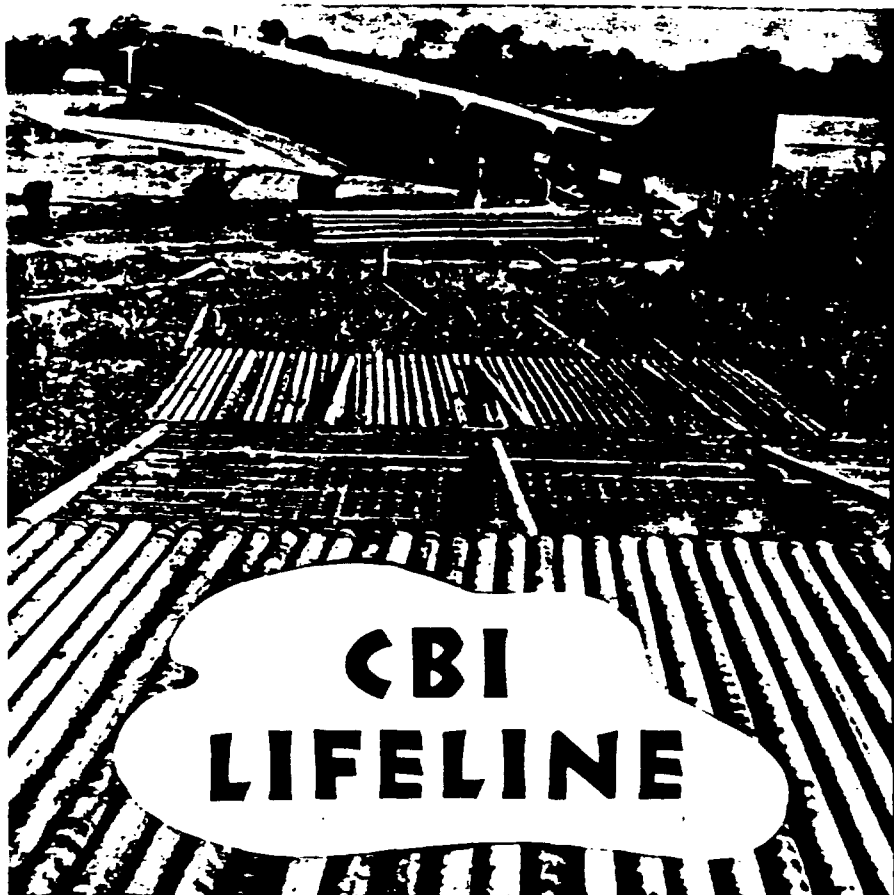
BACK IN THOSE awful days of 1942, when the onrushing Japs had sent the Allied forces reeling back all the way into India, after conquering Indo-China, Thailand, Burma, Malaya, and the once-proud citadel of Singapore, a fateful decision was made at Allied HQ in India.

Compelling that decision was this grim, hard fact: With the Japs astride the Burma Road, China's last overland lifeline to the outside world was now severed. To keep China in the war, it was imperative that she receive guns, ammunition, medicine, equipment, and most of all, gasoline. But how to get these priceless supplies to our beleaguered ally?

True, there was the CNAC air route, pioneered by Pan American Airways for the Chinese government, and running from India into China across the "roof of the world," the Himalayas. And this aerial Burma Road has since carried more vital supplies over the Hump into China than ever travelled the Lashio-to-Kunming highway. Moreover, the Allies determined to build a new Burma Road — the Ledo Road — back into China. But in order to send gasoline through, in anything like the amounts that would be needed when the Allies one day mounted the offensive, there was only one way: Build a pipe line — the longest pipe line in the entire world.

This was the decision made in India in 1942. Final decision to build that pipe line was handed down at the Quebec Conference in August, 1943, and construction got underway that fall. Today, that pipe line is well along toward completion. Here's what it has meant already:

It has powered the sustained



Start of the CBI pipeline — sections of pipe flown in by plane

Superfortress raids from bases in India, by pumping fuel directly to those bases.

It has substantially replaced the Indian railways (notoriously inefficient in peacetime) in shipping petroleum supplies from Calcutta north into Assam Province, where supplies for the Burma campaign and for China go forward.

And it has made possible the Ledo Road, in itself a truly epic achievement.

If the pipe line did nothing more than help to build the Ledo Road, it would have been worth all it cost in money, effort and lives. Pacing the construction of that road, the line pumped gasoline and Diesel fuel up to the "front line" of the road, fueling the trucks, bulldozers, shovels and road graders that did the incredible job.

And the Ledo Road was truly a front line every step of the way.

Often, construction of a section had to wait until the resisting Japs ahead were cleared out. Bulldozers were equipped with steel shields to protect their drivers from snipers lying in ambush. Cargo planes at times carried food, supplies and medicine to advance positions, to keep the work moving forward, while fighter planes drove off Japanese attacks. The road, completed by Brig. (now Maj.) Gen. Lewis A. Pick and his men, and since renamed the Stilwell Road in honor of "Vinegar Joe," has been called one of the greatest engineering achievements of the war.

As with the Ledo Road, construction of the CBI pipe line went forward against incredible odds.

Few people who have not been

there can imagine the difficulties encountered in this wild and forbidding country. Working in the oppressive tropic heat, the pipe-line crews hacked their way through dense jungles and rugged mountains, fought off wild animals, snakes and insects, as well as Japs, and stayed on the job through the torrential downpours of the monsoon season. Dysentery, Naga sores (from thorny bushes), lice and ticks made life miserable for the men. Leeches would burrow themselves an inch deep into the skin. A man can pull their tails off, but they still remain dug in — a burning cigarette tip is the only sure way to remove them.

To lay the pipe line, sections of pipe were hauled by truck as far as possible, then dragged on ahead by tractor or carried by portage. At water barriers, pipe rafts and pontoons fitted with outboard motors floated the pipe to where it was needed. Often the men had to work waist-deep in water, stringing the pipe and coupling it together.

Moreover, toeholds had to be clawed out of the mountains for the pipe and pumping stations, deep chasms had to be spanned by cables supporting the pipe at numerous points, and swift rivers had to be forced. Yet, through jungle, mountain, plain and river, the pipe line went forward. And it ranks as the greatest all-time achievement of its kind.

The pipe line was built under the over-all direction of Brig. Gen. Thomas F. Farrell, chief of the Services of Supply construction service and formerly chief engineer for New York State. Directly responsible for the two main sections of the line, however, were two pipe-line experts, Col. William C. Kinsolving and Lieut. Col. Birney K. Morse. Colonel Kinsolving, who was recently given the Legion of Merit

for his work, was formerly general manager of the Sun Pipeline Co. He previously helped plan the Big Inch when he was assistant director of transportation for the PAW. Colonel Morse was formerly chief engineer and a director of the Susquehanna Pipeline Co. Working under these men were engineer petroleum distribution troops, specially trained for the purpose in the United States. They were aided in their task by the Indian Pioneer Corps and some 7,000 coolies.

World's Longest Line

The pipe line, when completed, will run from Calcutta, India, to Kunming, China, a distance of 1,750 miles. This makes it the longest pipe line in the world, more than a fourth again as long as the 1,388-mile Big Inch. Built of easily transported invasion pipe, such as was used so successfully in the North African, Italian, and European campaigns, the pipe line consists of 6-inch and 4-inch lines.

The line runs from Calcutta north through the Brahmaputra Valley into northern Assam, a distance of approximately 750 miles. There it empties into a large storage terminal and continues on to Kunming, approximately 1,000 miles away. From Ledo onward, it follows the same general course as the Ledo Road, crossing the 4,000 foot passes of the Naga and Patkai Hills and passing through Myitkyina and across the Irawaddy into northern Burma.

The pipe line has greatly speeded the flow of gasoline and Diesel fuel to the fighting fronts. From the incoming tankers at Calcutta, gasoline and oil are pumped up into northern Assam. At that point, additional supplies are obtained from other oil fields and refineries. And from there, supplies fan out in three major directions — to the air bases in the Assam

Valley, by plane over the Hump into China, and across into Burma to fuel the Allied campaign against the Japs there.

And as valuable as the CBI pipe line has been to date, it promises even further to accelerate the war against the Japs. At present, Allied forces (chiefly British), after 15 months of savage jungle warfare, have scored a knockout victory over the Japanese in central Burma. When the Japs are cleared out of Mandalay, Rangoon, and other vital Burmese points, the Allies will recapture a shorter land route to China (the old Burma Road) with connecting rail facilities, a major seaport, and additional oil supplies from pre-war installations in Burma. These supplies can intersect the Ledo Road and CBI pipe line at any convenient point, and will greatly shorten the long haul into China.

For an eyewitness account of what conditions are like in the CBI theatre, come along on a trip taken not long ago by three technical experts. The party consisted of Errol J. Gay, head of Ethyl Corporation's Commercial Engine and Fleet Division and now on loan to the Army as a technical consultant on fuels and lubricants; Commander C. J. Livingstone, USNR, formerly of Gulf Research and Development Co. and now assistant chief of the technical branch of the Fuels and Lubricants Division of the Quartermaster General's Office; and Captain William A. Howe, formerly of Standard Oil Co. of N. J. and now in the Fuels and Lubricants Branch, Field Maintenance Division, Office of the Chief of Ordnance, U. S. Army. Mr. Gay has previously made three overseas trips during the war, working on various problems in the North African and European theatres, and has been awarded the Emblem for Meritorious Civilian

Service by the Army, the second highest honor that can be accorded a civilian.

The party went to India at the request of Major Gen. W. E. R. Cowell, commanding general, Services of Supply, India-Burma theatre, to help solve some technical problems related to fuels and lubricants in that theatre. Boarding a Douglas C-54, they took off from Miami, and 49 flying hours, 9,000 miles and many calluses later arrived in Karachi, in India. This is a trip that would have taken from 35 to 60 days by ship. From Karachi, the party travelled to New Delhi, and from there went to Assam, flew over the Hump into China, and travelled over the Ledo Road by truck and jeep.

Here are some of the impressions brought back by Mr. Gay:

The Indian railroads, with their different gauges and haphazard schedules, have long been a problem in peacetime. Since the war began, however, military personnel have taken over the operation of some facilities, and a vast improvement is to be noted. Take the meter-gauge Bengal to Assam Railway, which is the principal route for supplies headed for Assam, China or the Burma front, and which is now operated by U. S. Army railway battalions. Within a month after the Army took over, that railroad was delivering four times as much cargo as it ever did in peacetime.

Visiting any of the air fields constructed during the war, one is struck by the great accomplishment they represent. Comparable to some of the largest fields to be found in the United States, the fields in China were often built entirely by coolie labor — the only commodity of which the Far East has an abundance. Armed only with pick and shovel, these coolies dug the earth.



Above is one of the numerous bridges built in India and Burma for both the Ledo Road and CBI pipeline

Everything from a lumbering elephant to modern road machinery was enlisted in the construction project



To build the CBI pipeline, the crews often worked waist-deep in water, stringing and coupling the pipe





**Errol Gay of Ethyl Corp.
aboard a ricksha in India**

removed boulders and other obstructions, patiently broke up rocks into gravel for the fields. It was not uncommon for three or four hundred coolies to be seen pulling a 30-ton roller. Incidentally, while doing that job, the slackers would fall back to the end of the rope and take things easy. This was fine until a sudden lurch caught the slacker off his guard and pulled him under the roller. The result was one less living slacker.

The danger of flying the Hump into China can be fully understood only when you make the Himalayan milk run yourself. To clear the towering mountains, a pilot must maintain an altitude of 16,000 to 22,000 feet with a heavily loaded plane. One of the biggest problems is the mean and unpredictable weather — which can change completely within 15 minutes from clear skies to blinding rain and snow, and then change back again another 15 minutes later. The rate of plane loss has been considerably improved since the early days, but flying the Hump is still a hazardous adventure.

Similarly, only when you see the actual airline operation can the importance of this aerial Burma Road, in shipping supplies into China, be clearly visualized. The airline has ferried gasoline, equipment, even 2½-ton trucks over the Hump. A truck is taken apart, the chassis shipped in one plane, the body cut in two and shipped in another. It has been estimated to have cost as

high as \$28 a gallon for gasoline and \$48,000 for a truck, to have them flown over the Hump into China. But this superhuman effort to get supplies to our Chinese allies is more properly measured in blood and lives, rather than money.

In China, one of the most heart-breaking sights is the abject poverty of the natives. Many of them are clothed in rags, close to starvation, and hard hit by China's inflation. Moreover, there is a famine in metals; any kind of metal is worth even more than money. For that reason,



**Here's what CBI drivers face:
curves like a scenic railway**

American forces have to keep a close watch on their jeeps and trucks; leave them alone for a half hour and they will be stripped right down to the chassis. Even gas tank covers have been regularly thefted.

To conserve gasoline for aviation purposes, a substantial percentage of U. S. military vehicles in China has been converted to running on alcohol. This is done by adjusting the carburetor and applying more heat on the manifold. Alcohol, in fact, is the major motor fuel in China, made from Chinese rice and sugar cane. Yet, its production must be carefully adjusted in relation to China's food supply. To make more alcohol than essentially needed would mean less

rice and sugar to the Chinese, and might lead to starvation.

But to an oil or automotive man, the most impressive sight in the CBI theatre is the unbelievable roads that must be travelled. The best roads in China, for example, are comparable only to third-grade U. S. roads. But even this is an understatement.

The roads, some of them little more than combat trails, are tortuous, winding, bumpy, rough and treacherous highways. They have as much as a 25% grade, with hair-pin curves, against only an average 6% grade on U. S. roads. On the Ledo Road, the drivers in a convoy are repeatedly warned about the sharp curves and grades (see picture). G. I.'s are fined \$1 a mile for exceeding the speed limit. Officers are fined \$5 a mile. The roads are so tough on trucks that light units last only some 4,000 miles before being completely overhauled, or stripped for salvagable parts. The heavier trucks take similarly tough punishment.

Yet over these tough roads — and over the CBI pipe line — vital American supplies, including gasoline, are moving in an ever-increasing volume. The fruits of these Herculean labors are apparent in the sustained onslaught of B-29 attacks on the Japs from their bases in India; in the smashing success of the central Burma campaign; and in the strengthening of China's resistance. What they will mean eventually can be guessed, if, as is possible, China becomes the war's final battlefield.

**This road sign on the Ledo
Road tells its own story**





A model community in action. The housing project lets in lots of sunshine, has spacious grounds for sports and recreation

WHERE TO LIVE-AND LIKE IT!

By F. Richard Anderson

As important as that postwar home itself is the community you will live in. Here are some tips

THE good citizenry of the world have been moving away from city walls ever since mediaeval times. They first became suburbanites when they made an acute and sometimes painful observation that the builders of the Maginot and Siegfried Lines failed to note. Walls are no defense against an enemy.

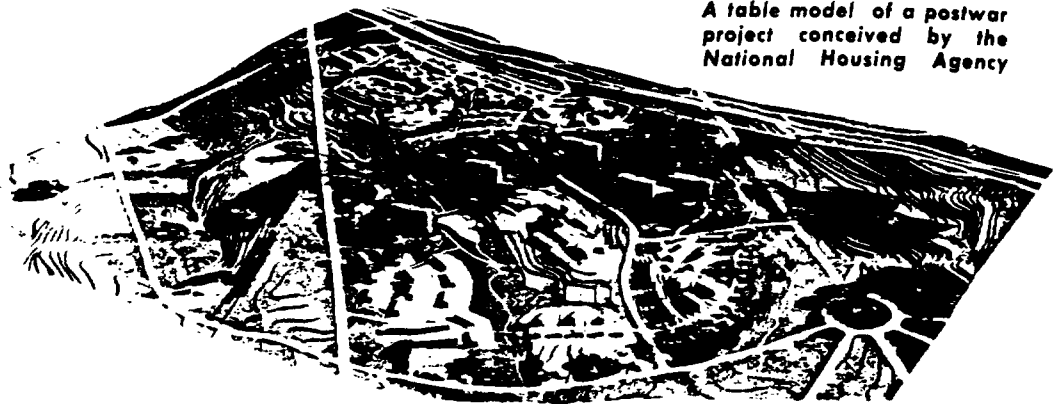
Since then suburban growth has reflected the increased speed and flexibility of transport services. Each improvement in transportation — from the first invention of the wheel right down to the internal-combustion engine — has encouraged this outgrowth.

After the war, our super-highways, parkways, automobiles and transit system will continue and increase this flight from the noise, dirt and congestion of city life. Too often, however, the city slicker settles amid the noise, dirt and congestion of an ill-conceived country community. It may be peaceful in the country, but it can be as disquieting as being shot at unless you give more thought to the neighborhood and community into which you are buying or moving than you do to some miracle push-button dream house idea that you are har-

boring during these war years. "The little white house, with the little white gate, at the end of honeymoon lane" can be an awful pain in the pate.

The house is naturally of primary importance. It must be structurally sound and well equipped with modern facilities. It and the property must fulfill your family's needs — but that is not enough. A house is an extension of a neighborhood, and a neighborhood a part of a community. This fact poses some important questions. Does the community provide good schools, police and fire

A table model of a postwar project conceived by the National Housing Agency



protection? Is there an efficient garbage and sewage disposal system? Are the streets well cared for, summer and winter? Where is the business and shopping center, and is it far from the house? Where are the churches? What and where are the recreational facilities? Is the neighborhood deteriorating? Will it become a slum, leaving your home high and dry among dilapidated buildings? If you don't want to go scuttling back to the safety of city walls, look before you leap!

A community that does provide the proper combination and balance of these all-important factors doesn't just happen. It is planned. And with it a community plan the little white mouse will soon become a turn-of-down shack.

The Federal Housing Administration's Land Planning Staff is the Number One organization concerning itself with this problem. Sites for more than a million homes have been provided in some 10,400 communities planned and started with the assistance of its staff since 1935. These communities will eventually house some 4,200,000 persons, or about a million more persons than the population of Chicago in 1940. That is about equal to the combined populations of Indianapolis, Denver, San Francisco, Boston, Seattle, Pittsburgh and Baltimore. When com-

pletely developed, these 10,400 communities will cover about 347,000 acres of land — an area even greater than that of Chicago and New York combined.

Private investors and builders have not so quietly been buying up large parcels of land within commuting distance of our cities from coast to coast. They have succeeded in the past or watched the successes of others in planning neighborhoods and communities profitably. Community building means quantity building, and that means reduced costs. Between 350,000 and 400,000 privately built dwellings, with an average value of \$5,000, will be built at a total cost ranging between \$1,750,000,000 and \$2,000,000,000 in the first year that wartime limitations are lifted and materials and labor become available. Another \$3,000,000,000 will be spent in that first year for repair and modernization work on present dwellings. The total, \$5,000,000,000, will be invested for the most part, it is hoped, in the improvement and construction of homes in planned neighborhoods and communities.

Some of the communities planned and started with FHA assistance in the last ten years are small neighborhood affairs of only a few dozen homes. Others are complete residential towns with shady parks,

playgrounds, shopping centers and schools. Some consist entirely of individual homes with sizable lots, the majority of the houses in the \$5,000 to \$6,000 class. Others consist largely of garden-type apartments with broad green courts in back, play areas with slides, sandboxes, swings and all the things to keep Johnny occupied. They are so arranged that Mom can watch Johnny from the kitchen or rear windows of her apartment. Still other communities are made up of both apartments and individual homes.

Design for Living

All these communities are laid out along modern lines, designed for living rather than for the number of lots and buildings that can be squeezed into a given piece of ground. To most of us, one of the strangest things about modern community planning is that more often than not they are laid out to provide more and better lots on the same piece of ground than was possible with the old-fashioned, gridiron type of planning.

Here's how it is done:

The streets and avenues are planned to follow the contours of the land instead of bouncing up and down over steep grades regardless of topography. As a consequence some of the steeper land very often

can be used for building sites, since it is not lost by road cuts and fills.

Fewer streets are used in modern planning, thus reducing land waste. As a consequence, there are more safe play areas for children — and more green grass for Pop to cut. Curved streets that follow the natural lay of the land help to reduce the cost of street construction and provide pleasant vistas instead of the monotonous faces of houses lined up row on row just so many feet from the curb. Traffic accidents are reduced by the avoidance of steep grades and hazardous intersections, and the speed of passing cars is slowed by the fact that the roads are curved instead of straight.

When the communities are planned, considerable attention is paid to pedestrian and automobile traffic to the shopping centers, schools, bus and main transportation centers. The towns are laid out so that the fast through-traffic on super-highways and parkways does not pass through the center of the residential and business districts. The shopping centers and schools are planned to be a convenient distance from the homes, and connected with the residential areas by streets that are safe for youngsters and not cut up with dangerous intersections with their inherent hazards.

Many of the larger communities have, in addition to playgrounds for kids, parks where the entire family can find rest and relaxation, parks with tennis courts and baseball diamonds, picnic grounds and pleasant walks and perhaps even a swimming pool. Sometimes parks of this type are planned for areas that are too expensive or impractical to develop for building sites, such as in ravines or very rough, steep, wooded areas. Often the developer realizes the value of parks in increasing the attractiveness of his community, and

will build a park so that a certain number of the houses will face on it, thus in many instances improving some natural feature and providing a view and play area. Improvements of this kind pay off in hard cash as well as in benefits to the entire community.

The remarkable thing about this kind of planning is that instead of boosting costs it usually reduces them. Such planning saves money on the cost of street construction, power lines, sewers and gas lines.

Planning Pays Off

Since well-planned communities are protected from adverse influences for long periods of time, they provide safe and profitable mortgage investment opportunities for banks and lending institutions as well as for the individual investing in a new home. The mortgage risk element in communities planned with the assistance of FHA Land Planning Consultants is reduced to a minimum. Almost all of the homes built in these communities are financed through FHA-insured mortgages.

The financing terms for owner-occupied, newly built homes cost-

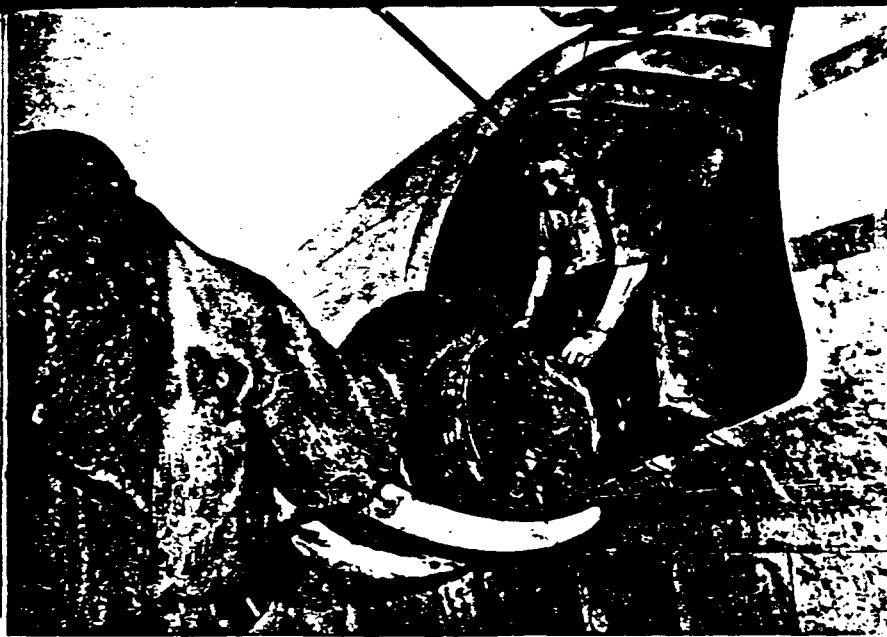
ing \$6,000 or less, for which the plans and specifications have been checked before construction, carry a twenty-five-year mortgage, a ten percent down payment on the FHA appraised valuation of the house and lot. The balance is carried at $4\frac{1}{2}$ per cent interest plus one-half of one per cent for FHA insurance.

The payments on this mortgage are made monthly like rent and include, in addition to payments on interest and principal, one-twelfth of the taxes for the year, hazard insurance, FHA mortgage insurance and any special assessments. This means that in buying or building a \$6,000 house, the prospective homeowner makes a down payment of \$600 and carries a \$5,400 mortgage. Monthly payments, excluding taxes and hazard insurance, amount to \$31.34. A small price for a design for living.

Business and government leaders are agreed that billions of dollars and millions of men will be involved in a postwar building boom. Since we all live in homes, the most important stake in this boom in building will be held by you, so be sure the boom doesn't go bang in bad building and poor planning.

In the shopping district of a well-planned community, children can romp in safety while parents shop inside. Covered walks protect both shoppers and window displays





Drums

*Loading a drum of gasoline
into a cargo plane for
the flight over the Hump*

TO OUR air forces in China, the most priceless weapon of the war can be summed up in a word: gasoline. Their devastating air raids against the Japs have been made possible only because precious gallons of gasoline came through from India — barrel by barrel — flown in by plane over the Himalayas. When completed, the new CBI pipe line (see Page 2) will also be available to ship gasoline into China. But even then — as at present — gasoline drums will still be used extensively in meeting the over-all supply demands in that theatre.

Because so much depended upon that barrel of gasoline, the Army's Air Transport Command some time ago set out to solve some serious problems that had arisen with the conventional steel drums in which all gasoline was shipped. What was needed, the ATC felt—besides more steel drums — was a new container that would be lighter in weight, more efficient and more durable — in short, one that could better withstand the rough handling encountered in the CBI theatre.

And now it has the answer.

With a new, lightweight aluminum container, the ATC has a gasoline drum that has many advantages

over the former steel drum, has added safety features—and has made possible a net increase in the amount of gasoline ferried to our forward air bases in China. Here's why:

The new aluminum container weighs only 22 pounds against 52 pounds for a similar 18 gauge steel drum. This saving in dead weight means that more vital gasoline can be flown across the Hump into China because more drums can be carried each trip. Also important is the fact that tests showed these containers could withstand greater internal pressure than steel drums, which is of interest at high altitudes. Moreover, aluminum is a non-sparking material, which is another safety factor.

But these are only a few of the numerous advantages which are claimed for the drums.

According to Major James Irvine, of the ATC, who tested them along the supply route to China, the containers won't rust or corrode, can be decanted directly into a plane, are free from contamination by water due to "breathing" during rain, and are easy to empty and clean because there are no seams to hold the gasoline vapors. Moreover, the drums are easily sealed to

prevent theft and tampering. If damaged, they can be easily repaired.

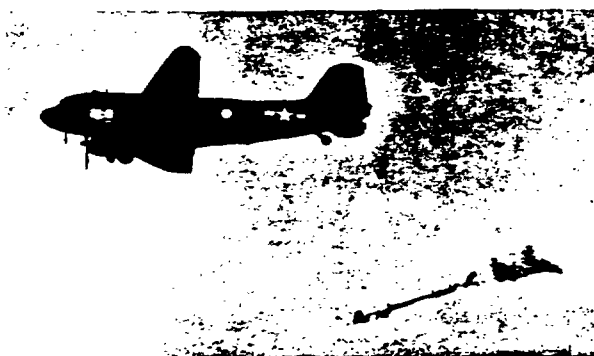
The drums were developed by the ATC in cooperation with engineers of the Aluminum Co. of America and the Aluminum Cooking Utensil Co. The latter company is now producing thousands of these drums monthly for the ATC. The drums, as manufactured, consist of two drawn aluminum shells which are first tack welded, then gas welded at the seams. A neoprene rubber tire is placed on each half of the drum, to cushion the shock of fall when unloading and to guard against rough handling.

Credit for developing these drums is given to Lt. Col. Walter Palmer and Mr. C. E. Edmunds, of the Supply and Service Division of the ATC, who before the war spent over 20 years each with the Standard-Vacuum Oil Co. Colonel Palmer earlier in the war travelled extensively throughout Africa and India, assisting with the planning of gasoline facilities and supply for the new ATC airline across those areas.

After a number of sample drums were first made, they were taken to the equipment laboratory of the U.S. Army Air Forces at Wright

OF WAR

More gasoline is being flown over the Hump into China — thanks to a new lightweight aluminum container



Drop-testing one of the new drums by parachute

The new aluminum drum consists of two drawn shells (below) which are first tack-welded (bottom left), then gas-welded for final joining. A neoprene rubber tire is placed around both ends of the finished drum, to cushion the shock of fall when it is unloaded

Field, Ohio, where they were rigidly tested for pressure, rolling, bursting and degassing. "The tests," said Major General Harold L. George, Commanding General of the ATC, "were beyond expectations." Subsequently, some more were flown to the CBI theatre by Major Irvine and put through their paces on the scene. There they were jugged in trucks along miles of rugged road, hauled by plane over the Hump, and parachuted to the ground from low altitude. The drums passed these tests satisfactorily and are now in service in the CBI theatre.

According to Major Irvine, the drums are particularly suited to the CBI truck haul and air lift, for all of the foregoing reasons. In addition, he believes they can be used in parachute dropping of water, soup and other liquids to isolated troops.

However, as to whether these drums are fully suited to peacetime use by the oil industry, it is too early to say. Against the particular advantages cited by the ATC is the all-important question of cost. Nevertheless, several oil companies are understood to be testing out these drums for possible postwar application.





"Can Do"



In record time, the Seabees built a four-lane superhighway on Guam, equal to any in the U. S.



To build the new superhighway on Guam, the Seabees even had to slice their way through hills



PICTURED on these pages are scenes of the reconstruction of Guam, retaken from the Japs last July and since become the headquarters of Admiral Nimitz. More especially, the pictures show the handiwork of the Seabees — the "can do" boys of the Navy — who jump in amidst the fighting and begin repairing the devastation of war.

Created only in this war, the Seabees are one of the most important branches of the Navy. Pacing its advance across the Pacific, they have swarmed over the bastions wrested

A section of the completed high points of Guam together, it is c

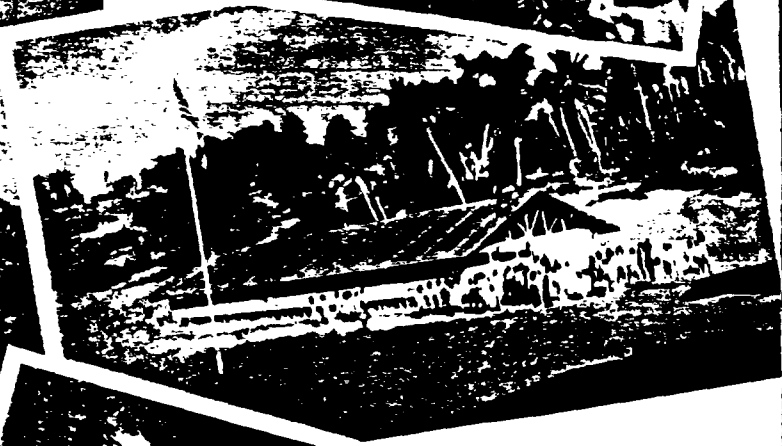


at Guam

from the Japs, repaired them and put them in shape to power further offensives against the enemy.

Guam is a recent testimonial to the skill and energy of the Seabees. Soon after the invasion of the island, which took a terrific bombardment from our ships and carrier planes, the Seabees landed with their equipment and went to work, building new roads and installations. Today, Guam is one of the most vital Pacific bases for our forces, close to the heart of the enemy — thanks to the Seabees.

These typical scenes of life in Guam show a home in Agana, a school for native children, and a general store



way in operation. Tying strategic
great value to our forces there



To the ordinary civilian, military titles are completely bewildering — but here's how the conflicting ranks could be unscrambled

THERE are too many "captains" in this war. The other night at a party I met three of them — an air force captain of 21, a bronzed 2½-striper in the Merchant Marine (skipper of a Liberty ship), and a crusty old Navy 4-striper who had been called back from retirement — all captains.

"Captain" is a bad word for designating a military rank. In the ordinary sense it means the *leader* of a group or unit — head of a ball team or a crew of bond salesmen, or the skipper of any floating object from a sand scow to the *Queen Mary*. It's confusing.

Just as confusing is the rank of "lieutenant."

The Navy has two kinds of lieutenants, the Army has two — and the four of them represent three different ranks. One afternoon a telephone rings and a gray-haired Navy lieutenant (junior grade, or j.g., with one-and-a-half stripes) hears: "This is Lieutenant Gadget. Why haven't the papers on Transport BCY been sent over to the Army?" The old jay-gee tells the lieutenant, "Sorry, sir. Yes, sir. Right away, sir," and raises a hullabaloo around the office because he thinks a two-stripe lieutenant is being kept waiting. What he doesn't know is that Lieutenant Gadget is a boot and lieutenant in the Army, one month out of officers' training school.

And if the services are confused, how about the civilian? How often have you heard something like, "My boy got his bars the other day. Captain now."



How's yours coming along — isn't he an ensign or a major or something?" Or, "I've got a brother in the Navy, and I know how the ranks go, but I can't get these Army ranks straight."

In the Marine Corps, which is a unit of the Navy, the officers use Army titles, from 2nd lieutenant to general. In the Coast Guard, which is an independent unit that works under the Navy only in time of war, the officers use Navy titles, from ensign to admiral.

Leaving out the warrant officers, whose titles are not misleading, set down the ranks in columns for comparison:

NAVY AND COAST GUARD	ARMY AND MARINE CORPS	COLLAR INSIGNE
ensign	2nd lieutenant	gold bar
lieutenant (junior grade)	1st lieutenant	silver bar
lieutenant	captain	2 silver bars
lieutenant-commander	major	gold oak leaf
commander	lieutenant-colonel	silver oak leaf
captain	colonel	silver eagle
commodore	brigadier-general	1 star
rear admiral	major-general	2 stars
vice admiral	lieutenant-general	3 stars
admiral	general	4 stars
admiral of the fleet	general of the army	5 stars

Let's clean up this matter of titles! Navy, Coast Guard, Marines, Army — all officers wear the same bars, leaves, eagles or stars to show their rank. They all receive the same base pay, have the same authority. *Why not designate their ranks by the same titles?*

We can go right down our two columns, picking the best names from each — and while we're at it we'll not only make a substitution for "captain" but get rid of all the clumsy hyphenated double-names like "lieutenant-commander."



CONFUSION

By North Clarey, Jr.



Look at our list. Take "ensign" for the first commissioned rank, "lieutenant" for the second. For the third rank let's draw upon an honored word: "brigadier." All officers wearing two bars on their collars will be, instead of lieutenants or captains, "brigadiers." The word has a ring to it!

For the next grade choose "major."

See what we've done so far: Eliminated all the parentheses, hyphens, and numerals — we've dropped "and," "1st," "(j.g.," and "lieutenant dash commander." At the same time, no one gets a new title which formerly designated a lower rank — there's no come-down. This

is heresy, of course, but so was the Declaration of Independence.

On the same principles, for the next grade of seniority, "commander" is a more apt term than "lieutenant-colonel." Next? Choose "colonel" rather than "captain," for the reasons we've already mentioned — and also because in traditional Navy usage, "captain" designates the commanding officer of a ship, whether he's an ensign or a commander.

So this gives us a uniform, common-sense list of titles: ensign, lieutenant, brigadier, major, commander, colonel. It's a good compromise — two names from the Navy, three from the Army and one (lieutenant) used by both.

But how about the officers of flag rank — commodores, admirals, generals? We'd better leave them as they are. After all, it's a bunch of admirals and generals that have to pass on these suggestions, before they can be put into effect. And there's no confusion — and in news reports or battle front communiques, generals and admirals are distinct enough as news personalities to warrant distinctive titles.

Many people will probably argue against the changes suggested here. Many people used to argue against the airplane as a military instrument. But this change is a logical one, and can be introduced with other logical military revisions which are bound to come after the war. The officers themselves won't mind greatly; as the services shrink down to postwar size most of them will be set back a rank or two, and will have to get used to new titles anyway. You can be sure they're not going to worry too much about a name. As they would paraphrase Shakespeare, "the pay's the thing!"

BROOM ON THE CONNING TOWER!

Frequently, these days, our submarines will return to their home bases with a broom lashed to the conning tower. Others will display little Japanese flags.

Either one is a happy sight — a sign of success on its last mission or cruise. The miniature flags are a new idea, but the broom dates back to the middle of the 17th Century.

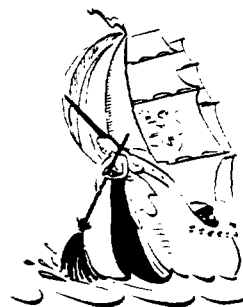
From 1652 to 1654 there was a bitter naval war between Holland and Eng-

land. Admiral Maarten Harpertszoon Tromp, sailing his fleet out to meet the ships of Cromwell, ordered each vessel to lash a broom at its masthead: "We will sweep the seas!" The English ships, in reply, fastened whips to their masts.

Tromp's idea later became an institution, a tradition in the fleets of many nations, but gradually it has died out. Today, few captains outside of our gallant sub skippers show the broom.

By an odd coincidence, many of our

submarines have been met and escorted home by a Dutch warship named after a 17th Century admiral — the *Tromp*!





THE FREEZE ON FOODS

By Hiram K. Smith, Jr.

ONE DAY last week, while many others went without, some two million families could go to their ice boxes, pick out a choice assortment of roasts, steaks and chops, and sit themselves down to a hearty meal — with meat on the table!

But they were no ordinary ice boxes these people possessed. They were instead the two million individual food lockers, found in the nation's 6,200 frozen food locker plants, and rented from the operators of these locker plants for a moderate fee. By having stored away in their lockers sides of beef, pork and lamb — purchased when supplies were most abundant — these people could go to their food lockers at any time, pick out their day-to-day rations, and thereby stretch their supplies through periods of local shortages.

This is only one of the surprising things about frozen foods in wartime. Equally surprising is the fact that quick-freezing and the use

The frozen foods industry, which may revolutionize eating habits, looks to a bright postwar future

of locker plants for storing frozen foods have assumed the proportions of a big and thriving industry.

To the fortunate families who live in communities where locker plant service is available, the locker has brought a revolutionary change in eating habits. Perishable foods, including fruits, vegetables, meats, fish and poultry, can be bought at their peak of freshness — and lowest cost — stored in these lockers for months at a time, and taken out and eaten with their original flavor and freshness intact.

Meat, for example, can be slaughtered at any time, brought to the locker operator who packages and quick-freezes it in the plant, and stored in the patron's locker until it is needed. Quick-freezing, moreover, means that much of the growing season's wealth of fine fruits and vegetables can be prepared and stored in the locker. Strawberries in February, fresh meat in August,

peaches in May, broccoli in December — all of these are now a commonplace to locker-using folks. And remember that quick-frozen produce must be prime quality; mediocre grades won't take the quick-freezing process.

A modern locker offers its patrons an amazingly complete service.

Divided into, roughly, five sections, it provides a large area devoted to well-insulated zero-storage space filled with tiers of individual steel cabinets. These are the food lockers, and each holds from 200 to 300 pounds of produce. Besides the lockers themselves, a locker plant has a modern butchering shop, where meat is cut and wrapped to patrons' specifications; an ultra-modern preparation kitchen, where fruits and vegetables are made ready and wrapped for quick-freezing; a temperature-controlled "chill" room, where meat and produce are given a pre-processing come-down; and,

possibly, an up-to-date curing department, where hams, bacons and so on are prepared to your individual taste.

Most locker patrons rent their lockers for \$8 to \$25 a year, pay processing and service charge of 1¢ to 1½¢ or more a pound. Although most locker plants are in predominantly rural areas, there are some in urban and suburban communities. In Waynesboro, Pa., for example, about 50 per cent of locker space is rented to city dwellers. And in White Plains, N. Y. (population 40,000), urbanites rent 85 per cent of locker space. It's quite likely, industry authorities agree, that post-war expansion of locker plants will be in the direction of urban and suburban areas. Wartime restrictions, meanwhile, continue to restrict to rural sections all new plant construction.

Some of the most successful locker plants now in operation are those run in conjunction with an existing business, such as a grocery or meat market or gas station, and many forward-looking small businessmen see this development as an important job-maker, postwar.

One midwestern gas station operator, with a fine location on the outskirts of a thriving community, plans to erect a large locker plant beside his existing building. He believes that his many customers, long since in the habit of stopping for service, will appreciate the additional service he can give by providing food processing and storage.

This whole idea of a "community icebox" goes back to the time of the last war, when farmers rented space for their individual use in their local cold storage warehouses. Most of us can remember the unpalatability of "cold storage" food, however, and the locker industry's boom began only after significant progress had

been made in the improvement of zero storage and quick-freezing methods.

Just how headlong this industry's growth has been is apparent in the fact that as recently as ten years ago there were no more than 250 locker plants throughout the entire country. Now there are 6,200. Minnesota's first plant was opened at Waseca in 1935; four years later the state reported 213 in service. Iowa had six plants in 1935; today she leads the nation with 580.

Surprising Growth

The locker plants' growth in the South in recent years has been even more impressive. As late as 1939, for instance, Texas had only one plant. Last September, 207 were in operation. On a nationwide basis, construction reached the rate, in 1939-40, of 62 new plants a month! Some idea of what the locker plant means to rural Americans is implicit in this fact: about 75 per cent of all plants are located in towns of less than 5,000 population; only about 7.5 per cent in towns larger than 25,000.

Although it is much like the question of the chicken-and-the-egg, facts seem to indicate that the modern locker plant began to grow as a business only after retail sale of commercially packed quick-frozen foods was begun.

It was back in 1930 that foods packed and quick-frozen by a process developed by Clarence Birdseye were introduced to housewives. Ordinary slow freezing, as Mr. Birdseye and many other experimenters well knew, forms large, visible, needle-sharp ice crystals that pierce a food's cell walls, allowing its most desirable elements of color and flavor to bleed away when it is thawed for use. The Birdseye process, which is owned by the General Foods Corporation, subjects freshly harvested, packaged foods to such sudden low temperatures that the ice crystals formed are microscopic and don't cause color and flavor loss.

Immediate public acceptance of quick-frozen foods led other researchers to improve some of the other excellent quick-freezing processes. New refrigerants were dis-

This modern locker plant even has a retail display counter up front. Directly behind is the cutting room





Preparing a supply of fresh vegetables for freezing, after which it is stored in the patron's food locker

Meats, fish, poultry, vegetables — even pies — can be easily stored in a frozen food locker



covered — among them Freon, developed by the late Dr. Thomas Midgley, Jr., inventor of Ethyl gasoline. Progressive food men, applying some of the improved refrigeration techniques, began building modern locker plants.

Meanwhile commercial packers hopped on the bandwagon, using quick-freezing processes similar to the privately owned Birdseye system. By 1939, General Food's Birds Eye brand was only one of several hundred national and local brands on the market, and every canner and packer in the nation was watching with apprehension or anticipatory eyes the unbelievable development of the new industry. That year 450 million pounds of quick-frozen foods were sold, and noting that this volume represented some \$100 million in retail sales, some experts were predicting the day when quick-frozen foods would account for a fat 25 per cent of the nation's annual food bill.

And they may not have been too optimistic!

Information at hand is that food freezers and their equipment makers are preparing for annual food sales totaling 3.5 billion pounds within five years after the war. Today, frozen foods are on sale in about 40,000 stores. But grocery men estimate that within a few years after the war's end quick-frozen foods will be available in 100,000 stores — or about one out of every four groceries and combination grocery-meat markets in the land. To lend weight to these predictions, it's interesting to note that in 1944 the commercial quick-freezing industry alone packed a whopping half-billion pounds, or about 6,000 times its first year's volume! And this doesn't take in the hundreds of millions of pounds of frozen produce stored in individual food lockers.

Such surprising acceptance of quick-frozen foods has led, within the past eight years, to development of still a third potentially gigantic segment of the quick-freezing business: the home freezer.

A home freezer is simply a well-insulated box designed to freeze and store, or simply to store, any of the numerous foods that have been found adaptable to the quick-freezing process. Its history goes back only to about 1938. Two models were on exhibit at the New York World's Fair of 1939-40, and at that time a few manufacturers were making "farm" freezers on a small scale. In the next couple of years — before war halted further production — the idea caught the public fancy, and several thousand units were produced. Today about 50,000 are in operation.

Future Possibilities

But tomorrow! The postwar possibilities for the home freezer have the refrigeration industry in a turmoil — and with good reason.

For the home freezer as an appliance never has been marketed in open, peacetime competition on a scale comparable to the present indicated demand. So when experienced, hard-headed businessmen predict millions of units will be bought in the first few years, postwar, they have no good sales figures to base their estimates on. What they *do* have, however, is a pretty good picture of the market gained from the terrific incidence of retail sales of quick-frozen foods and the steadily climbing volume of locker plant patronage.

A freezer of more than 16-cubic-foot capacity is generally called a "farm" freezer (although to be sure some of this size will be found in urban and suburban communities). Practically all farm freezers are dual-

temperature models designed both to freeze and to store foods. That is, one compartment can hold a temperature of minus 10° F or lower, for *freezing*, while the other compartment, usually the larger, maintains a constant temperature of about zero, for *storage*. Farm freezers are huskier than the others, and can handle heavier peak loads. Incidentally, "quick" freezing usually calls for heavy commercial or locker plant equipment. Home freezers don't freeze produce so rapidly, but it's fast enough, never fear.

Single temperature or storage-only cabinets can be labeled a "home" locker, while dual-temperature boxes up to about 15 cubic feet properly are "farm" freezers. For our purposes, however, "home freezer" can be used to describe them both.

From the experience of present home freezer users, it's possible to predict what kind of freezer you'll most likely want after the war.

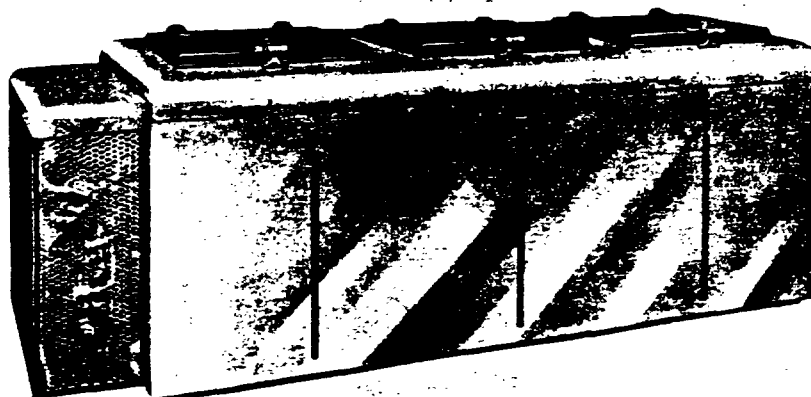
If you live in a truly rural area — an isolated farm or ranch — possibly you'll be most interested in the largest dual-temperature models. But if you're in a locker plant community, and can depend on it for most of your processing and some storage, a medium-size farm freezer would fill the bill. Suburbanites probably will like the idea of a large home freezer or even a farm freezer. City dwellers, however, probably

will be satisfied with a home locker, since they'll buy most of their quick-frozen produce in large packages from a wholesaler or their local merchants.

About fifty varieties of quick-frozen foods are available today, including meats, sea foods, vegetables, fruits, pet foods, and last but not least, pre-cooked meals. Moreover, it's likely that all frozen-foods consumers are going to have available such handy items as pre-cooked baked beans, beef, veal and lamb stew, Welsh rarebit, a number of soups, clam chowder, pies and pastries. Yet even this sort of service may not be enough to satisfy those homemakers who are happiest when they're kitchen busy.

If quick-frozen foods change the nation's eating habits after the war — as well they may — equally profound will be the changes brought about in agriculture. Quick-freezing will do much to even out our food production cycles, stabilize farm income, and improve our standards of living. For the farmer, quick-freezing will materially help him to plan his crop production and assure him of selling all he produces. For the consumer, fresh fruits and vegetables will be available all year round, regardless of their growing season — and at low cost. And as for the men in the frozen foods industry, well they've got their future figured out cold.

One of the first postwar frozen food lockers to be announced, this model has dual-temperature control





These knock-testing engines at an Ethyl laboratory determine the octane number of gasolines tested

In war as in peace, Ethyl's gasoline testing labs perform a useful service for the oil industry and motorists



For the **BEST** in gasoline

On the Sawmill River Parkway in Westchester county, a maroon-colored sedan stepped along. Riding the level stretch of the road, the car purred like a kitten full of cream. But as the car took a sharp, winding grade, a faint ping-ping-ping became audible in the motor.

"George, you'd better ease up on the throttle," said the man seated next to the driver. "This wartime gasoline we're getting just won't take it, particularly on hills. Why, in my own car I find I must take it easy most of the time — if I want to get the most mileage and best all-around engine performance."

"Yes, I know," said George, easing up on the accelerator. "When I remember to take it easy, I don't have much trouble with motor knock. But say, Bill, I wonder just how bad this wartime gasoline is?"

George didn't know it — but the answer to his question was not far away from where he was driving. For, less than a hundred yards off from the parkway, in the outskirts of Yonkers, N. Y., was Ethyl's largest gasoline testing laboratory. Inside the modern, well-equipped lab, a battery of single-cylinder knock-testing engines was testing a number of gasoline samples. Most of these research engines were running on samples of present-day civilian grades of motor fuel — and in terms of octane number they showed how much civilian gasoline quality has suffered during the war. But there were other research engines, operating on higher octane fuels. And they gave promise of what the civilian motorist could expect in better gasoline after the war.

Unknown to many people — but

of great service to the oil industry and in turn to motorists — are Ethyl's six gasoline testing laboratories. Strategically located throughout the country — in Yonkers, N. Y.; Baton Rouge, La.; Tulsa, Okla.; Kansas City, Mo.; San Bernardino, Cal., and Detroit, Mich. — these laboratories daily take in samples of gasoline, put through a series of exhaustive laboratory tests. In a typical year, these laboratories will handle some 25,000 samples. Each sample undergoes anywhere from one to nine different tests.

The samples tested come from three principal sources — oil refineries in the territory served by the testing laboratory, and service stations and bulk plants in scattered points. The refinery samples are tested primarily to insure that Ethyl gasoline conforms to the standards

established for it under license agreements with oil refining companies. The field samples provide a spot-check against any deterioration or contamination of the gasoline after it leaves the refinery.

Customer oil companies are immediately informed of the results of individual analyses, as an aid to them in controlling the quality of their gasoline blends. Most oil companies, of course, maintain their own gasoline testing laboratories, although some are not completely equipped. In any case, however, Ethyl's facilities serve as an independent check on gasoline quality, are used to test out samples refined by new processes and equipment, and provide an over-all picture of existing conditions and trends. (During the war, Ethyl's gasoline testing labs have also been used to test both special and "type-test" fuels, in conjunction with our research laboratories in Detroit.)

Moreover, Ethyl has, since 1942, furnished another service to the oil industry—a quarterly survey of gasoline quality throughout the United States. Based on refinery samples submitted from various sections of the country, these quarterly surveys provide a prompt report on prevailing gasoline quality and trends in quality, both for premium and regular grade motor fuels. They serve a useful purpose, not only to the oil industry at large, but to operators of big fleets, among others.

During the war, Ethyl's gasoline testing facilities have taken on still another job: testing gasoline for the Army. Under a contract with the Quartermaster Corps, samples are sent in from Army posts, camps and stations and from shipments destined overseas, and tested for conformity with U. S. Army specifications. Ethyl's labs stepped in to do this job because the testing facilities of the

Quartermaster Corps, and of available commercial laboratories, were inadequate for the purpose. Accordingly, Ethyl tested a substantial part of all the gasoline sent abroad in blitz cans for the North African campaign. At this present time, some 3,000 to 3,500 gasoline samples are tested annually for the Quartermaster Corps. The tests include all standard laboratory procedures.

Soldiers Trained

Finally, at Ethyl's gasoline testing laboratory in Tulsa, soldiers have been taught during the war how to operate knock-testing engines. This training was part of a course, given by the Quartermaster Petroleum School at the University of Tulsa, to fit these men for specialized work in the Quartermaster Petroleum Field Laboratories. Stationed up near the front lines, these field labs spot-check all petroleum supplies—including those captured from the enemy—which are to be used in U. S. military vehicles. The knock-testing engines, of course, are used to establish the octane number of the fuels.

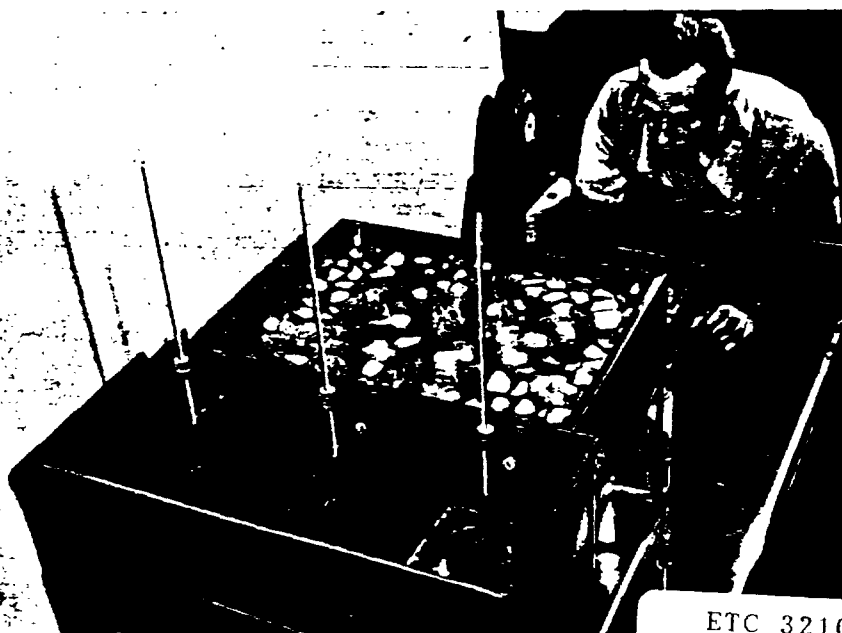
When a gasoline sample is put through its paces at an Ethyl lab, it's

like a person taking a basal metabolism examination from a physician. A knock-testing engine takes its pulse; the distillation apparatus records its temperature; other equipment makes a careful record of all other characteristics, good and bad. In all, there are nine standard tests, regularly performed, that take in determination of octane number, lead analysis, color, gravity, gum and sulphur content, corrosion, vapor pressure and distillation.

Of all the laboratory tests, those covering octane number and distillation are the most important, from the standpoint of performance. For they provide an index of the gasoline's rated power and of its relative volatility (meaning the tendency to vaporize, and develop that power, at different driving levels).

Take distillation first. Simply by noting the temperatures at which successive fractions of the gasoline are distilled off, a lot is learned about that fuel's volatility at different driving stages. For example, the temperature at which 10% of the sample has been distilled is indicative of the quick-starting characteristics of the fuel. The 50% point temperature is known as the acceleration factor.

This shows the standard test for volatility, as performed at an Ethyl gasoline testing lab



The 90% point is an index to any crankcase dilution of the gasoline that might be expected, particularly in cold weather.

The distillation tests tell a laboratory technician most, but not all, about volatility. The final test that must be taken is to determine the vapor pressure of the fuel. This is an important check because if too high a percentage of the gasoline vaporizes at the lower temperatures, vapor lock will result — blocking the supply of fuel to the engine.

To determine the octane number of a test fuel, the sample is run through one of the Coordinating Fuel Research engines. Unlike ordinary engines, these specially-designed knock-testing engines are equipped with a variable compression ratio device and several carburetors which can be used alternately. By increasing the compression ratio of the engine as the fuel is being consumed, the fuel is made to knock. Then, by switching over to a second carburetor on the engine, a mixture of reference fuels is run through the engine. These reference fuels provide a known octane rating. By selecting a reference fuel that produces the same intensity of knock as the sample fuel, the octane number of the test sample is established.

Due to the versatility of these knock-testing engines, a range of driving conditions can be duplicated, to study their effects upon fuels. A knock-testing engine can simulate a chugging jalopy or an airplane at cruising speed. Four laboratory methods are used to determine octane number, two each for motor and aviation fuels. Motor fuels are tested by the standard CFR (F-1) research and ASTM (F-2) motor methods, airplane fuels by the Aviation ASTM (F-3) and Supercharged (F-4) methods. The CFR and ASTM methods are used in con-

junction because of their individual value at different driving speeds.

Besides these "performance" tests, Ethyl's laboratory technicians make a careful check of other characteristics of a gasoline sample, to insure that they meet the standard specifications. The test for gum content, for example, is an important one in this group. If the gum content of a gasoline is too high, it will slow down, if not completely stop, an engine. Each individual test, then, is a guarantee that gasoline — even present-day wartime grades — meets the essentials demanded of it for satisfactory performance in an engine.

Surveys of Gasoline Quality

From the scores of gasoline samples tested every day, Ethyl's labs are able to get a prompt and accurate picture of gasoline quality generally. At regular intervals, this data is gathered together from each of the labs and combined into the quarterly survey of gasoline quality. That survey, embracing the whole United States, is an up-to-date picture of gasoline quality. Here is what the most recent survey shows:

Reflecting the reduction in octane rating previously ordered by the PAW, the average octane number of Ethyl gasoline this past winter was 75.8. For regular grade gasoline, the average octane rating was 70.3. Before this wartime decrease in quality became necessary, most motorists were able to buy Ethyl gasoline with an octane rating of 80, regular grade gasoline rated at 75 octane number. As matters stand, today's premium grade gasoline is about equal, in octane number, to what prevailed in 1934-35; regular grade fuel, to what was sold in 1937.

There has likewise been a loss in volatility, because of the need to divert the lighter fractions of gasoline to military and aviation grades. Be-

cause of this, present premium fuels for civilians are only as volatile as comparable fuels in 1934; the volatility of regular gasoline compares to that of 1933 grades.

This is the extent, then, to which the quality of civilian motor fuels has declined in order that ample supplies of the best gasoline could be sent to the fighting fronts. But there is a brighter side to the picture. As soon as military requirements permit, civilian gasoline quality is going up. More than that, civilians will in time receive better gasoline than ever before. According to one survey, the average octane number (ASTM) of postwar premium motor fuel will be between 85 and 88; of regular gasoline, between 78 and 80.

This, then, is one measure of the better gasoline civilians will get after the war. But until the oil industry can resume its normal function of providing motorists with continually improved gasoline, it's important to bear in mind: "The best gasoline is still fighting."

OUR PICTURES

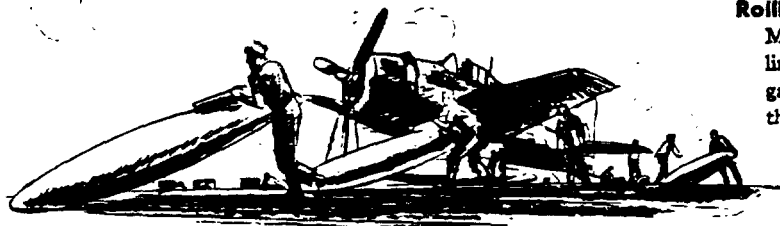
Cover, official U.S. Army Air Forces kodachrome; Pages 3 and 5, U.S. Signal Corps photos through Acme Newspictures, Inc.; Page 7, Margaret Lowe photograph through courtesy Museum of Modern Art; Page 8, National Housing Agency photo through courtesy Museum of Modern Art; Page 9, Maynard Parker photograph of Linda Vista shopping center (Earl Giberson and Whitney Smith, architects) through courtesy Museum of Modern Art; Pages 10-11, courtesy Air Transport Command and Aluminum Co. of America; Pages 12-13, Official U.S. Navy kodachromes; Pages 14-15, cartoons by Rodlow Willard; Pages 16 and 19, courtesy *The Refrigeration Industry*; Pages 17 and 18 (top), York Corp. photos through courtesy *The Refrigeration Industry*; Page 18 (bottom), courtesy Frigidaire Division, General Motors Corp.

THE BEST GASOLINE IS STILL FIGHTING !

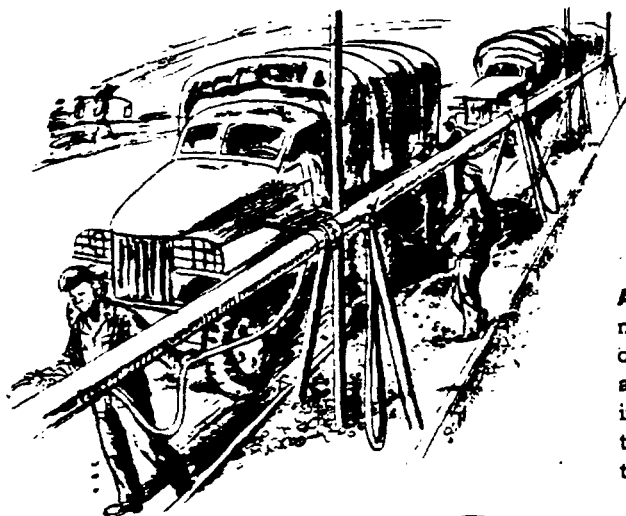
*Rough impressions
of gasoline's role on the
battle-fronts - based on actual incidents
and official photos.*



Rolling toward Tokyo. American Marines roll precious barrels of gasoline "somewhere in the Pacific"... gasoline that soon will help to drive the Japs from another island.



Belly Tanks for Navy Hellcats. These auxiliary tanks, filled with high-octane gasoline, added more than 900 miles of range to Hellcat fighter-bombers—gave the Nips many an unpleasant surprise.



A Convoy Gasses up from the pipeline on the Stilwell road. Through this vital "artery" tens of thousands of gallons of high-octane gasoline are being supplied to American and Chinese forces.

At this stage of the war some of your customers may not understand why the quantity and quality of gasoline must still be limited. The growing operations against the Japanese homeland are continuing to take millions of barrels of the best gasoline that American refiners can produce. Practically all this fighting gasoline is improved with Ethyl fluid.

So remember—"the best gasoline is still fighting" and will keep on fighting until final Victory. That's why car-owners cannot expect complete elimination of restrictions on the quantity and quality of gasoline until the Army and Navy say it's safe to cut back on military production.

ETHYL

CORPORATION
CHRYSLER BUILDING
NEW YORK 17, N. Y.



Ethyl is a trade-mark name

CHECK YOUR BRAKES! NATIONWIDE POLICE PROGRAM April 15-June 1

E

1 $\frac{100 \text{ FT.}}{30.5 \text{ M}}$

$\frac{20}{100}$

2 $\frac{70 \text{ FT.}}{21.7 \text{ M}}$

THE BEST

$\frac{20}{70}$

3 $\frac{50 \text{ FT.}}{15.2 \text{ M}}$

THE BEST GAS

$\frac{20}{50}$

4 $\frac{40 \text{ FT.}}{12.1 \text{ M}}$

THE BEST GASOLINE

$\frac{20}{40}$

5 $\frac{30 \text{ FT.}}{9.1 \text{ M}}$

THE BEST GASOLINE IS

$\frac{20}{30}$

6 $\frac{20 \text{ FT.}}{6.1 \text{ M}}$

THE BEST GASOLINE IS STILL

$\frac{20}{20}$

7 $\frac{15 \text{ FT.}}{4.75 \text{ M}}$

THE BEST GASOLINE IS STILL FIGHTING

$\frac{20}{15}$



It's easy to see why gasoline on the home front remains short on both quantity and quality. Not only does the war require over thirty-five millions of gallons of U.S. produced gasoline daily, but all this gasoline must be of superb quality. Practically every gallon of aviation and military gasoline is improved with generous amounts of Ethyl fluid.

Furthermore, you don't need 20-20 vision to see that about the only thing that will greatly change this situation is complete final victory. Not until then can we promise car-owners unlimited quantities of high-quality Ethyl gasoline—the gasoline that will bring out the best performance of any car.



ETHYL
CORPORATION

CHRYSLER BUILDING, NEW YORK, N. Y.

ETHYL IS A TRADE MARK NAME

ETC 32111

ETHYL NEWS



JUNE ★ 1945

ETC 32112



IN THE

ETHYL NEWS

JUNE 1945

Lt. Col. Edward E. Rothman comes back to the Ethyl Corporation — this time as Director of Public Relations for the Detroit Research Laboratories — after a hitch of nearly three years with the Army Air Corps. He was active in the desert campaign in Africa and participated in the air support for the invasions of Sicily and Italy. He was awarded the Bronze Star for meritorious work during the invasion of France.

Upon entering the Army on August 1, 1942, as a Captain, he was assigned to the Overseas Supply Section of the Headquarters Air Service Command, Patterson Field, Ohio. In January, 1943, he flew to Cairo, Egypt, to join the Supply and Maintenance Section of the Ninth Air Force Service Command. The duty of the S. and M. Section was to support the Ninth Air Force in the desert campaign and later the invasions of Sicily and Italy.

Later the same year, his Headquarters was moved to England to build the Ninth Air Force, destined to become the Invasion Air Force. By D Day, the Ninth had been built up to the largest air force in the world.

Lt. Col. Rothman went to France on D plus 2 Day in charge of Supply for the Ninth Air Force Service Command. From Normandy, he went through France, Belgium and Luxembourg.

Before entering the Army, Mr. Rothman was consultant on advertising and public relations with headquarters in the Detroit Research Laboratories of the Corporation.

YOUR POSTWAR PLANE IS HERE!

3

The first private planes for civilians are expected out in August. They will help to fill the pentup demand for personal planes — but the public's postwar "dream plane" is still some years away.

A MAN AND HIS TRACTOR

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Modern farm machinery has helped farmers to overcome their manpower shortages . . . but here's how it helped one to lick a disability.

TIRES WON'T RESTRICT GASOLINE SALES

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Expert opinion of the rubber industry is that neither the quality nor the quantity of synthetic tires will retard driving speeds, annual mileages, or gasoline consumption postwar.

OIL AT TWO JIMA

12

Here is a vivid account of oil in action at Two Jima — the scene of some of the war's toughest fighting.

WHEN DO WE EAT?

16

Whether the present food shortages will get better or worse depends not upon lend-lease, military demands, or the fate of black markets. It depends upon the weather . . . and here's why.

THE FLEET BEHIND THE NAVY

20

Our Navy has been able to carry the war to Japan's home shores — thanks to this "secret weapon" that carried the Navy.

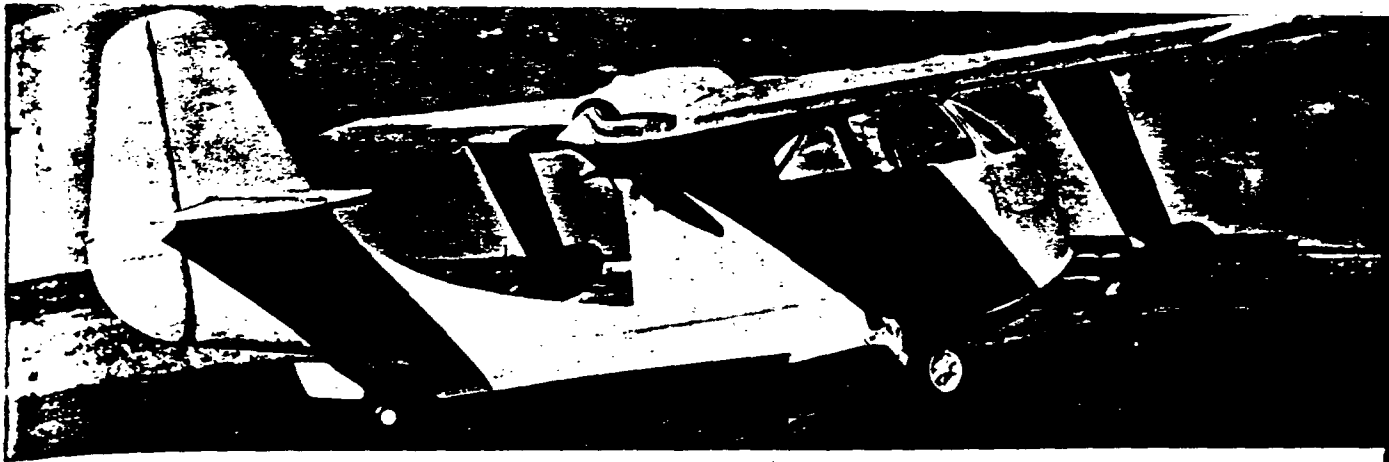
In order to widen the fields of reader interest in Ethyl News, we frequently publish articles contributed by writers not associated with Ethyl Corporation. Any opinions expressed in these signed articles, of course, are the authors'. The editors of the News welcome articles of timely interest submitted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

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

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

Earle W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzalez, secretary

ETC 32113



The 4-place Republic Seabee, an amphibian, is a popular model

YOUR POSTWAR PLANE IS HERE!

By Richard P. Cooke

The first new private planes, forthcoming in August, mark the start of postwar air travel for civilians

FROM HERE ON OUT, it's a race as to which will hit the civilian market first — the postwar car or the postwar plane. The car manufacturers are of course having a race among themselves to bring out new passenger car models, but what about the private plane builders?

With the war in Europe over, many plane manufacturers, their military commitments permitting, have been given the go-ahead signal to start producing aircraft for civilian use. They expect to begin receiving essential supplies of steel and aluminum about July 1. On that basis, a few believe they can have their first postwar models on the market sometime in August, with additional models forthcoming in October.

The reason why many light plane manufacturers will be able to jump into civilian production so quickly is simple. Most of them have been turning out training planes for the armed forces — and reconversion to civilian aircraft production is a relatively easy matter. Their main prob-

lem has been obtaining the needed materials to build these planes. They now have the flat assurance of these materials. And assuming that sufficient manpower will be available, they are all set to go ahead.

That being the case, what will postwar planes look like: immediately? eventually? Here's what civilian air enthusiasts can expect:

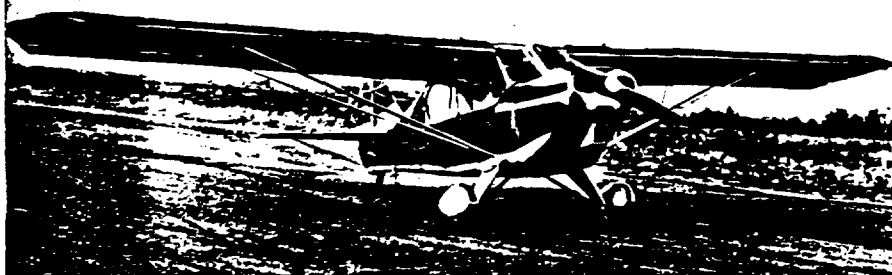
The first postwar planes will be very much like the pre-war types. As in automobiles, the demand for planes is so large that any kind of model is eagerly awaited by the public; basic improvements in design and efficiency will come along in subsequent models.

When these latter planes do come along however, they will incorporate the lessons learned during the war — and will give the personal flyer more for his money than ever before. It may take three or four years for these really new planes to reach the market in quantity.

After that, perhaps in five to ten years, will come the period of full achievement, with many innovations

and advances. Then will be seen the personal helicopter, the roadable airplanes, and possibly the jet propelled plane — each equipped with greatly improved instruments and capable of really superior performance.

The first stage is now at hand, and it looks as though the personal plane operator will have to pay \$600 to \$1,000 — probably nearer the higher figure than the lower — *per seat* for his air vehicle as compared with perhaps \$200 a seat for his postwar automobile. Taylorcraft Aviation Corp., which hopes to make first deliveries in two or three months and attain a real production basis in six months, is offering as a rock-bottom cost plane a two-seater at \$1,200. But a deluxe two-seater will cost \$2,500 and a four-place family utility plane close to \$4,000. These more expensive models will not come along until after the first low-cost two-seater makes its production debut. But Taylorcraft feels confident in a big ultimate market, having already booked orders for 4,700 planes — four times its largest pre-war annual output. The Taylorcraft management expects a \$20 million annual business, building perhaps 10,000 planes a year when full production



Left, the Taylorcraft B-15, a 4-seater. Below, Engineering & Research's Ercoupe



can be achieved three or four years from now.

Engineering and Research Corp. plans to market its Ercoupe at \$2,800 to \$2,900. It expects to produce its first units within 60 days after receipt of materials. The Ercoupe was one of the most popular pre-war planes, and promises to have a good initial start postwar. Carrying two people, it is spin-proof and has simplified controls making for great ease of operation. It incorporates a nosewheel, pointing the way to adoption of the tricycle landing gear by most personal planes later on.

Other Postwar Contenders

Stinson Division of Consolidated Vultee Aircraft Corp. plans to market its four-place Voyager for somewhat less than \$5,000, and one report states that the plane can be produced in three months after all facilities and materials become available. The Globe Aircraft Swift, a \$3,000 plane with good performance, has aroused a lot of interest, and there are many comparable situations. Piper Aircraft Corp., a pre-war leader, hopes to start production of its L-4 two-seat Cub trainer, now used for Army observation work, within a month after materials are forthcoming. Some materials already are available for this craft, and a little later Piper expects to start making the three-place Cub Cruiser. The two-seater plane will sell for around \$2,000.

Lockheed Aircraft Corp. has built a small, light one-place ship which it wants to offer for \$800 or \$900, and, as soon as practicable,

plans to develop and sell models up to four-place size.

Another type plane which will be available relatively soon is the executive type, a somewhat more expensive and higher-performance plane for use by company personnel. The Grumman amphibian "Widgeon," a four-place, twin-engine ship, is a good example, although this plane will probably cost \$25,000 to \$30,000 after the war. Fairchild Engine & Airplane Corp. has plans for a series of fast, comparatively long-range planes costing upwards of \$5,000 and probably nearer \$10,000, although the company is reluctant to name prices at this time. Now largely occupied with war work, Fairchild is not quite at the threshold of production. But the executive field is regarded as one of the most fruitfully potential, especially during the balance of the war and the immediate post-Japanese war period. Sales of surplus craft by the government to corporations indicate a widespread interest in the executive aircraft.

But although these planes and others with familiar names offer some advantages over pre-war models, they do not give the public all it

has been expecting. The problem is price. Surveys show that the public expects a family plane—which means a four-place job—for \$3,000 or less. The public also wants a plane that can get some place against headwinds which may hit 60 miles an hour or more in certain parts of the country, and which can fly at altitudes high enough to get above bad weather. Sufficient range is wanted to permit cross-country trips, and real jaunts for vacations.

Also, popular demand will require instruments which will operate in thick flying weather to prevent a plane from banging into hillsides or colliding with other planes in the air. Such instruments, probably radar types, will be needed especially in congested areas along the East Coast or around large cities like Chicago. Radios much cheaper than are now available also will be a necessity of traffic control.

To do all, or at least some, of these things is the task of the engineers and manufacturers who will be offering these new improved planes three or four years from now. The cost of instruments now standard, such as ammeters, must be brought down to a range comparable with

automobile instruments, if completely equipped planes are to be offered between \$2,000 and \$3,000.

Engines are going to be more powerful in these newer planes than the 40 h.p. to 75 h.p. range obtaining in many pre-war planes and many of those offered immediately post-war. Engineers already are shooting for a mark of \$3 to \$3.50 cost per horsepower for engines as compared with \$5 or over for most engines today. The ultimate goal for the combined airframe and engine will be somewhere around \$1 per pound, a figure considerably below anything so far offered the public.

To Fit the Purse

Although by no means answering all the questions, the Republic Seabee, a four-place amphibian, seems to be one of the concrete steps toward the plane of the future. Republic deliberately set the price of this amphibian, the only plane of its type near the price, at \$3,500, because it believed that is what the public would pay. Then the engineers got to work to cut the cost to match the price. By radical re-designing of wing and tail structures, the number of parts, and hence the number of labor operations, was cut by two-thirds or three-quarters. Cost was reduced to well under \$1 per pound, far below figures previously attained for planes of similar size. Republic plans to install a 185 horsepower engine, with a pusher propeller. It is obvious that if \$5 a horsepower had to be paid for the engine, Republic would be set back nearly \$1,000 before anything else was done. Hence the search for a \$3, or less, cost per h.p.

One secret of the low cost of the Seabee lies in its tooling. Having been reassured by a popular response which already has placed orders for 3,000 Seabees on the books,

Republic feels it will be able to install greatly improved tooling for large-scale output. Cost of the new tooling will be absorbed, it estimates, at a production rate far below that made possible by the orders now on hand. Previously, a similar four-place amphibian would have cost the buyer \$5,000 or more.

The designers of these improved planes will also have to think of maintenance, as the public probably does not count on spending more than \$75 a month to keep its planes running. One recent development has been the introduction of an Alemite lubricating system by Stewart-Warner, which may help to simplify this problem. Engines will be designed to use gasoline mostly in the 80 to 87 octane range, rather than the 100 or higher octane gasoline used by military aircraft.

After these greatly improved, cheaper and more useful planes expected in three or four years, there will still be many new types to come. Some of them may surprise us and come sooner, but aeronautical experience teaches it is always best not to expect changes to be too rapid. For example, the variable-pitch propeller, permitting much greater efficiency than the fixed pitch, is today too expensive for the private flyer, but may be eventually made available to everyone. Then there are such radical planes as the Spratt wing, developed by Consolidated Vultee. This craft has but one wing (no tail surface) which pivots on the

end of a shaft, performing all the functions of rudder, ailerons and flaps. It is still experimental, but offers definite possibilities.

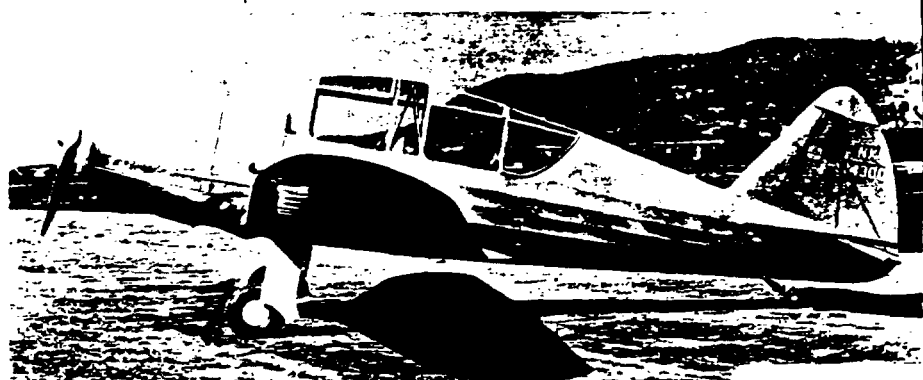
The helicopter, now a craft for experts and too expensive for private use, in five to ten years will probably be sufficiently reduced in cost to attract a large market. The helicopter solves a majority of flight problems for residents of built-up areas, or where flying weather is likely to be poor. Controls must be simplified and a lot of improvements made, however, before a four-place one can be purchased for less than \$3,000.

Jet propulsion cannot be ignored, but is not yet ready for private flyers. Despite its disadvantage of high fuel consumption, the jet principle would provide vibrationless and almost noiseless flight at high speeds and altitudes. The low cost of such engines and the greater fuel loads which could be carried would help offset the jet's many disadvantages for the small plane. But the application of jet to personal flight is too far off for accurate appraisal.

Construction of adequate airports to accommodate the new crop of private flyers will start before too long, and in half a decade the estimates of 300,000 to 500,000 private craft in the air seem quite possible of realization.

The start may be a trifle slow, but big acceleration will come with the new values to be offered in the next five years.

The Piper PT-1, a 2-seater model, is one of the company's entrants in the postwar private flying race





A MAN AND HIS TRACTOR

Modern power machinery has helped farmers to overcome their manpower shortage — but here's how it helped one to lick a disability



Walter Urben, though crippled, is still able to do a man-sized job of farming — thanks to a tractor. The above pictures show him plowing, fueling his tractor, feeding his prize bull, and finally, driving his herd of cows home after the day's work is done

BACK IN 1931, Walter Urben, a dairy farmer of Nampa, Idaho, was stricken with infantile paralysis, and as a result was left partially paralyzed. For many people, this affliction has brought an end to their useful careers. But for people like Walter Urben, it was only the beginning.

Today, Walter Urben is the successful operator of a thriving dairy farm. Having no hired hands to help him with the chores, Mr. Urben has to do all of them himself. Yet, neither the lack of farm hands nor his own

affliction has hampered his operation of the farm. For, like many another farmer, hard-pressed by the manpower shortage, Mr. Urben learned a valuable lesson. That lesson meant making full use of powered farm machinery.

With a tractor, Mr. Urben has won complete freedom of movement around his farm. He uses it to take him to every corner of the place and to help him do his chores. From sunup to sunset, it is his faithful companion and workhorse, helping him to do everything in the

course of his day's work.

Mr. Urben has a set of attachments for the tractor, which he finds easy to couple and unhook, and which do many of the chores formerly performed by hired hands. And when he has found the abilities of the tractor attachments limited in any way, he has solved that problem neatly. He simply "Urbenizes" them with ingenious improvements, being an accomplished tinkerer in his own right.

The benefits to be derived from full-scale power farming did not

come to Mr. Urben the moment he was stricken with infantile paralysis. As a matter of fact, like countless other farmers, he did not become aware of them until the wartime shortage of farm help stared him in the face.

For about a decade after he was stricken, Mr. Urben managed to get by as a farmer simply by employing hired help who used horse-drawn implements to do the various chores. But with the advent of war Mr. Urben's help went into the armed forces or into war industries. Finally he was faced with the grim decision of either selling his farm or finding some magical means to overcome his manpower shortage. Fortune came to his rescue when a tractor salesman introduced him to power farming. He bought a Ford tractor, complete with Ferguson System implements and tools, from the Lindsey Tractor Co., of Nampa, Idaho, a dealer affiliated with R. M. Wade & Co., Ford tractor distributors in the Northwest.

Horses to Horsepower

With his tractor Mr. Urben not only solved his manpower shortage, but in addition made the pleasant discovery that power farming is easier, more productive, more economical, and hence more profitable. So easy and profitable, in fact, that Mr. Urben vows he will never go back to farming with horses.

With his high-compression tractor Mr. Urben is able to do virtually all of the chores around his farm. As he himself says, "My tractor has been a means of transportation to me in ditch running, going for the mail, doing errands, and rounding up the cows at milking time. At times I almost live on my tractor."

Like many another farmer, Walter Urben knows that take-off power from his tractor can be used in in-

numerable ways, depending upon the needs of an individual farm. Many farmers during the war, for example, have used "power off the belt" of their tractors to saw wood, mix fertilizer, elevate hay and grain to the barn loft, and do many other labor-saving operations that ordinarily were delegated to the hired man.

It has not been necessary for Mr. Urben to make any alterations in the construction of his tractor to make for more convenient operation other than to install one hand control on the brake. He is, however, contemplating the installation of a similar hand control on the clutch to facilitate faster action than he is now able to get due to his crippled leg.

To accommodate his crutches, which he needs to transport himself to and from the tractor, Mr. Urben has built a bracket on his tractor. However, the crutches do not take up much room and for him are a very necessary accessory.

No slug-a-bed, Walter Urben always gets off to a bright, early start on his chores. He is a strongly built man, and with the aid of a steel brace on his disabled leg, and his crutches, gets around on his working day. Likely as not, at any time a visitor may find him, a crutch in one hand, and the other hand gripping a shovel or some other implement. Nearby, as always, is his tractor.

On a typical day, his first task will be to attend to his 16 Guernsey cows whose udders are turgid with rich, creamy milk. A modern, quick-action mechanical milker speedily helps him perform this job.

Mr. Urben may then drive out to set the irrigation water in a field which he is preparing to plow. Driving back to the barn he hooks up the plow and begins his work in the field. That finished, likely as not he will drive over to inspect the three-year-old Guernsey herd sire he is using to breed up his dairy herd.

Walter Urben practically lives on his tractor the livelong day, right up until he rounds up the cows and herds them safely back to the barn.

Later in the evening comes time for relaxation. His daughter, Norma Jean, insists on keeping up with each day's happenings to her heroes and heroines in the comic strips. So one of her father's last chores each day is to read her the comic section before she goes off to bed.

Because of his ability to succeed in a difficult job — in spite of his crippled condition — Walter Urben should be an inspiration to many wounded war veterans, who, having lost an arm or leg, would still like to become farmers after the war. In Walter Urben's case he has shown what modern farm power machinery — and determination — can do.

Tackling the many chores on his farm is a cinch with his tractor. Here he is coupling on a plow



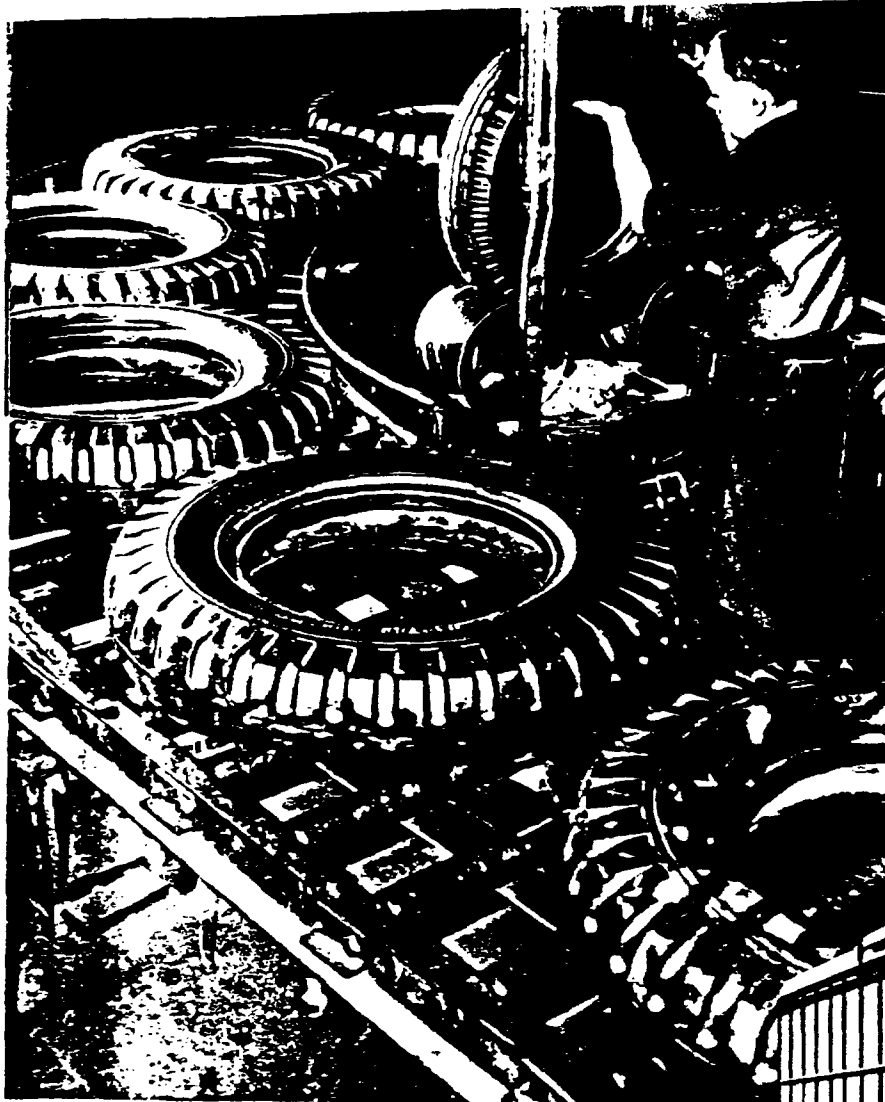
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Tires -

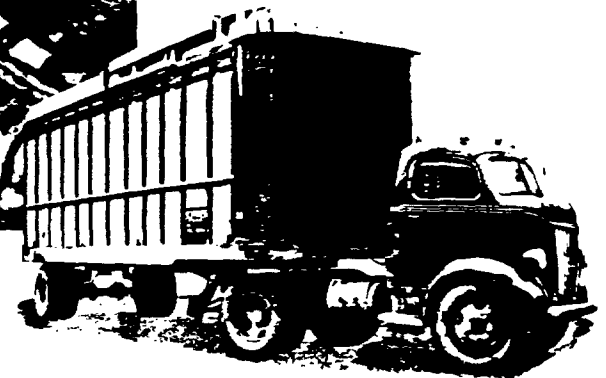
SYNTHETIC rubber represents possibly the greatest paradox of the war.

Never before has a nation, suddenly cut off from natural supplies, been able to offset that loss quantitatively to the extent synthetic rubber has replaced crude. As a volume producer, the synthetic rubber industry is scarcely three years old. Yet by the end of 1944 it was producing, on an annual basis, more synthetic rubber than the greatest amount of crude rubber ever consumed in the United States.

But at the same time, never have supplies of rubber tires — for civilians — been so critically short. Never has the motoring public, from the



Military demands for tires have been so great that they could be fully met only at the expense of civilian truck and passenger car tires



big fleet operator down to the private car owner, had to depend so greatly upon a new and unfamiliar product for its transportation. And even now, although the war in Europe is over, bringing the expectation that military needs for tires may decline, civilian drivers still face their sternest test. They must get through the worst period of the war — the summer months — before any substantial relief can be forthcoming.

But while national attention is riv-

WON'T RESTRICT GASOLINE SALES

Expert opinion of the rubber industry is that neither the quality nor the quantity of synthetic tires will prevent the restoration of pre-war mileage totals

ered on the current, deeply critical situation, oil men have been concerned about still another phase of synthetic rubber.

This is its postwar outlook as it relates to the rehabilitation of automotive transportation then. Here, the question is not simply whether there will be enough man-made rubber tires, after the war, to equip new and pre-war vehicles both. The question is also whether these synthetic tires will restrict driving speeds, annual mileages, and accordingly, gasoline consumption. This of course is based upon the assumption that ample supplies of natural rubber will not be available for some time to come, hence, that the burden will fall mostly on synthetic.

For an answer to these questions, the *Ethyl News* contacted James J. Newman, vice president of the B. F. Goodrich Co. Here are his company's views:

"It is highly improbable that any restrictions on the number of cars in operation, or on the miles per vehicle which they travel, or on the speeds at which they travel, will be imposed by tire supply limitations. Some tightness may exist for 12 to 18 months following the end of hostilities but should not continue longer. It is our opinion, therefore, that the volume of gasoline sales will not be materially affected by tire shortages."

Supporting this conclusion, Mr. Newman points to the greatly expanded fabricating capacity of the tire industry that will be available to

meet civilian needs postwar. This enlarged unit capacity will prevail despite the limiting factor that synthetic rubber is characteristically hard-to-handle (it takes as much equipment and manpower effort to process 750,000 tons of synthetic as it does to process 1,000,000 tons of natural rubber).

Two Expansion Programs

The tire industry has undertaken two successive expansions in unit fabricating capacity, one that was begun in 1943 and is now complete, and the second which was authorized late last year. The effect of these two programs will be to increase fabricating capacity to a level of 28 million truck and bus tires a year, and to provide, in addition, for large numbers of airplane and farm tractor tires. Since a substantial part of this capacity is designed for six- and eight-ply tires, Mr. Newman

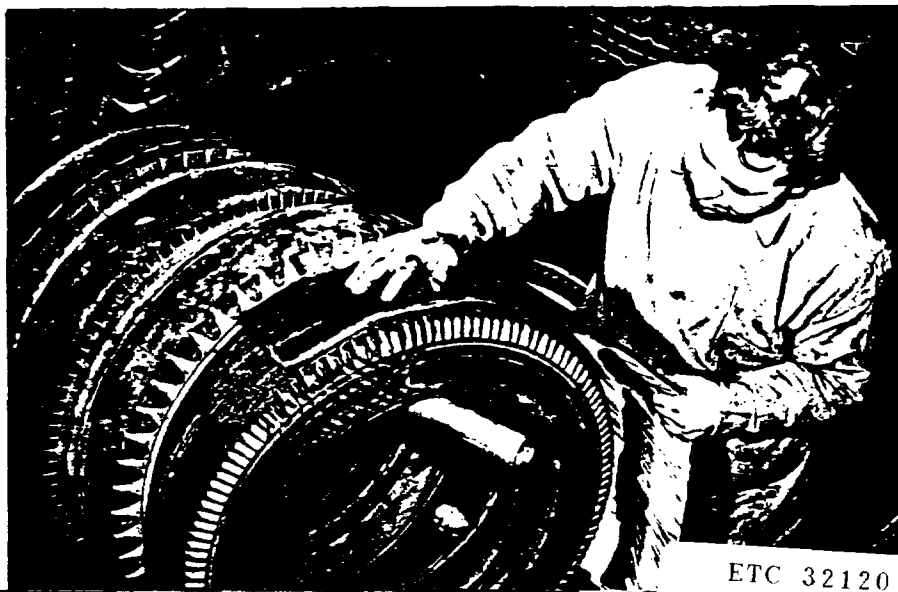
points out, it can also be used for the production of passenger car tires after the war.

Taking into consideration only the capacity authorized and building before December 1st last, Mr. Newman says, it is estimated that the industry can secure 96 million total tires a year, of which 74 million may be passenger car tires. (The additional capacity since authorized will increase both of these totals.)

"This projected capacity," he declares, "will be sufficient to handle an original equipment tire demand of 30 million tires a year — the tire requirements of six million new passenger automobiles — and still leave more than 45 million passenger car tires annually for replacement use."

"Without attempting to forecast the time of the end of hostilities, it is probable that there will be somewhere between 22 and 24 million passenger automobiles in operation when the end does come. The potential supply of tires available for these cars would then be sufficient for at least two new tires for each vehicle each year."

Recapping of worn tires is one of the most important things a civilian motorist must do to keep his car in operation



ETC 32120

Here, then, for oil and automotive men, is an appraisal from an authoritative source in the rubber industry. It is a straightforward prediction from an executive of one of the leading rubber companies that synthetic tires will not restrict postwar motoring or gasoline consumption. And it is of added significance

because it reflects the thinking of men in the industry—men who know synthetic rubber's present shortcomings and imperfections—men who are close to synthetic rubber's technological development and postwar possibilities.

This long-range forecast should be reassuring to one section of the

motoring public in particular. That group embraces the commercial users and operators of bus and truck fleets. They are the men who most depend upon synthetic rubber tires. For it is they who must keep the nation's highway transportation system operating.

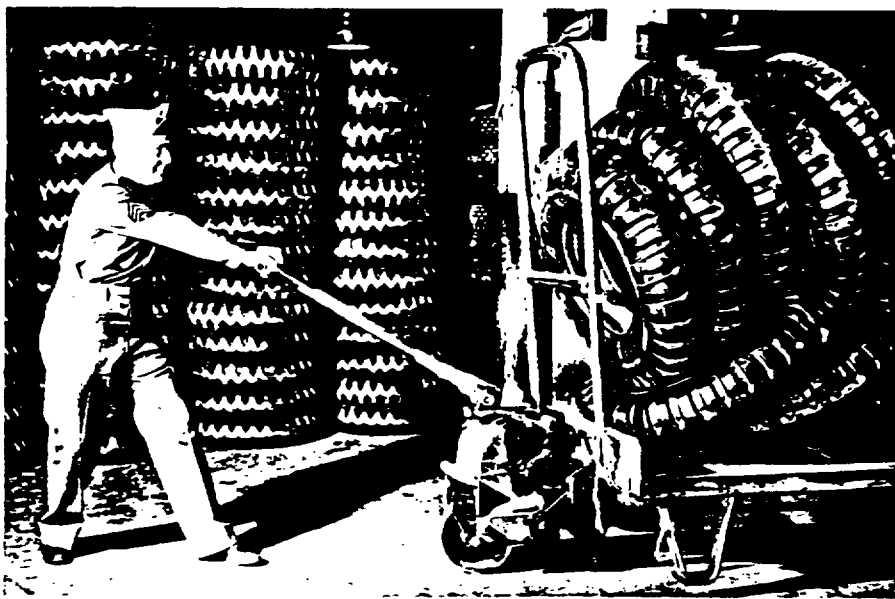
In their present state of development, the most satisfactory synthetic tires have always consisted of a large percentage of natural rubber. But as the war bit ever deeper into our crude stockpile, civilian tires have had of necessity to consist of greater and greater proportions of synthetic rubber, less and less "flavoring" of crude. Though synthetic passenger car tires are 90% as good as first quality natural rubber tires, the performance of truck tires is not yet so good. Operating upon present wartime grades, heavy duty users in particular have been most seriously affected.

In some types of heavy duty, high speed service, users report unsatisfactory service from presentday synthetics, despite careful maintenance and constant inspection. The most frequently named faults are that synthetic rubber tires have less resistance to heat (which causes the plies to separate) and can't withstand the flexing of heavy loads. Moreover, vehicles equipped with synthetics have shown a loss in horsepower on dynamometer tests, which is another serious factor.

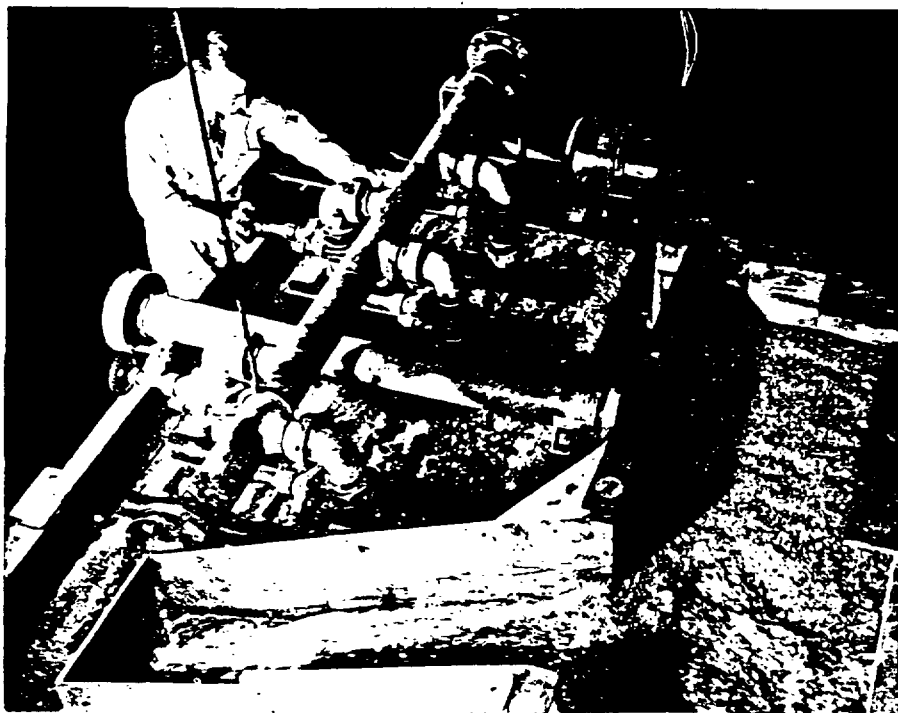
It is of course true that these synthetics are being operated under strenuous wartime driving conditions, in which vehicles are frequently overloaded and constantly in service. Be that as it may, commercial bus and truck operators are admittedly in the most critical period of the war. In the immediate future, their only hope is for more synthetic tires, not for better ones.

Synthetic rubber has been up

To relieve the rubber industry's manpower shortage, the Army temporarily released experienced personnel



In three short years, synthetic rubber capacity has skyrocketed. Below, an intermediate manufacturing step



against so many shortages during the war that sometimes overlooked is the singularly great accomplishment it represents.

Against an output of only 8,000 long tons in 1941, the nation's synthetic rubber plants last year produced a whopping 763,255 long tons (and at the end of the year were producing at an annual rate of 900,000 tons for all types of man-made rubber). Actual production last year was greater than the average annual tonnage of natural rubber consumed in the United States in the five years preceding the war. And by 1946, the United States is scheduled to produce 1.2 million tons annually — or more rubber than was ever consumed by the world in any year except 1941. As the WPB has said, synthetic rubber ranks as one of the greatest war production achievements.

Besides the phenomenal production of synthetic rubber, additional supplies have come from our stockpile of crude rubber and from wartime imports of crude from producing areas that escaped Japanese conquest. As of Pearl Harbor, natural rubber stocks totalled 533,000 long tons. Since then, well over 400,000 tons additionally have been imported. However, the wartime needs for rubber have been so great that by last January 1st the nation's stockpile had been drawn down to the danger point of 96,000 tons — and further deep inroads are expected this year. The Allied invasion of Borneo gives promise that rubber supplies from one of the world's greatest producing areas, the East Indies, will eventually be forthcoming. Meanwhile, the critically low level of the stockpile makes it imperative that natural supplies be restricted to only the most essential uses, at least until the stockpile can be replenished.

With almost the entire transportation burden laid upon synthetic rubber, the industry has been up against practically every shortage on the books. It has been short of capacity, short of component materials (principally carbon black and rayon cord), short of fabricating facilities, and short of manpower. Primarily responsible for these shortages, of course, have been the mounting military demands for tires. These demands have been so great that meeting them fully has been possible only at the expense of civilian tires. Military needs for large-size tires have cut into the production of civilian tires for large trucks and buses. More tires for light trucks and jeeps have had to come out of passenger car tire capacity.

Yet, despite its very many difficulties, the rubber industry last year produced nearly 18.8 million passenger car tires, 17.5 million of which were released to civilian drivers. At the same time, the number of passenger car tires recapped last year, 25 million, was the greatest on record. These two factors, according to a study by the B. F. Goodrich Co., were sufficient to replace all tire mileage consumed in that year.

Conservation Still Essential

It is virtually impossible to forecast with any accuracy what the whole of 1945 will bring, either for passenger car or heavy-duty tires. Against a previous drastic slash in civilian allocations, the end of the war in Europe has brought a reappraisal of the situation, and promises more tires for essential civilian users. But the remaining military requirements will still severely limit the increase — which is from the rock-bottom level of the war.

One thing is certain, responsible authorities agree. To keep the nation's automotive system going, it



Until natural rubber is again available in ample quantities, synthetic must carry the load

will be highly essential for the motoring public to continue to observe wartime tire conservation measures completely and to make full use of recapping facilities. The motoring public must take the greatest possible care of its tires, keep them properly inflated, rotate them regularly, drive them carefully — and have them recapped for longest service. Without this conservation, a great many cars and trucks will be needlessly lost to their owners.

In all likelihood, these next few months will tell the story. Keeping its fingers crossed, the WPB hopes that by midsummer it will have achieved a better balance between the supply of component materials and synthetic rubber's overwhelming need for them. By then, it is expected, more supplies of carbon black and bead wire will be forthcoming. High tenacity rayon will still be short — but cotton cord can be substituted in the smaller tire sizes, if enough of it can be had. At that time, too, a number of the new truck tire fabricating units, presently building, may be in operation. And from there on out, the tire situation should get better, it is felt.



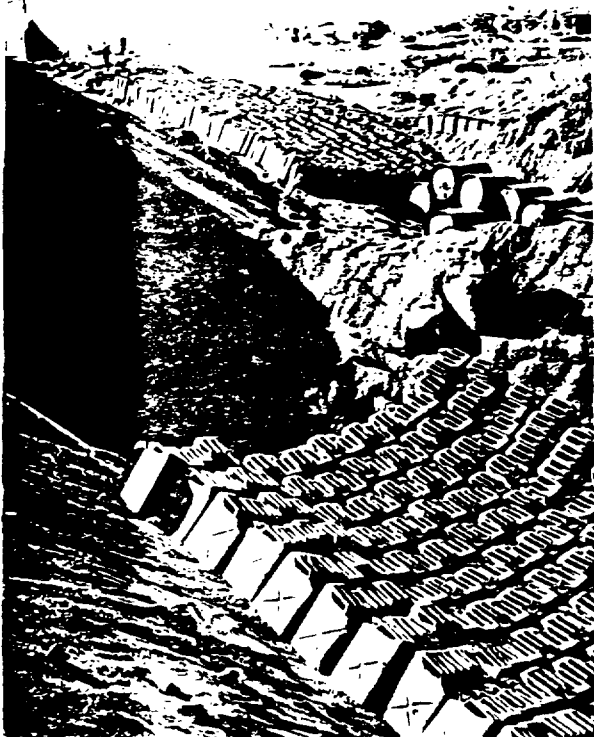
Oil...

Above, invasion craft in the waters around Iwo Jima. Right, a wave of Marines begins the grim job of battle



...at IWO JI

Blitz cans of gasoline, hurried ashore from landing craft, were cached thusly



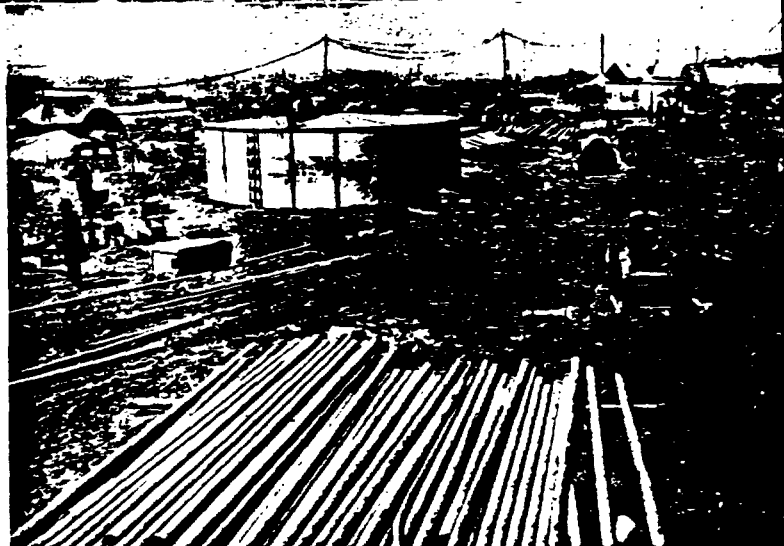
The conquest of Iwo Jima involved some of the fiercest fighting of the Pacific war. But in this action, as in all others, oil played an important part — helping our forces to overcome the fanatically resisting Japs.

From beginning to end, oil powered the attack. It fueled the warships and carriers that laid down the pre-invasion bombardment. It drove the invasion barges that swept in against fierce opposition. It propelled the planes, tanks, jeeps, trucks, and all the other equipment that carried our forces on. Enough petroleum products were used in the invasion to fill a train of 10,000-gallon tank cars 238 miles long.

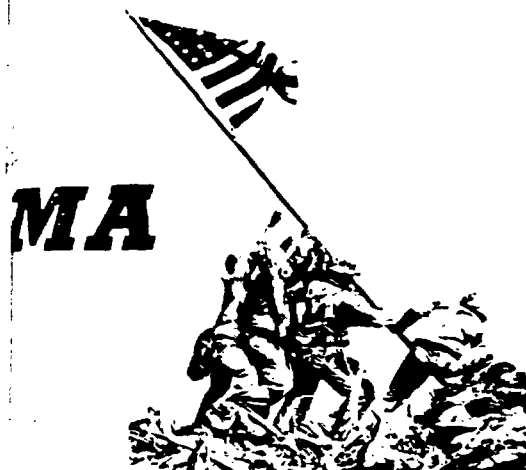
And when the island was finally won, oil aided in the vast job of reconstruction that turned it into a new U. S. base. Here, on these pages, is a vivid account of oil in action at Iwo Jima.



These pipelines were hastily laid to power the push across Iwo Jima. They are typical invasion pipelines



These quickly-built tanks were used for storing the oil supplies used in the Iwo Jima campaign



This jumble represents empty drums of gasoline which have served their purpose in battle

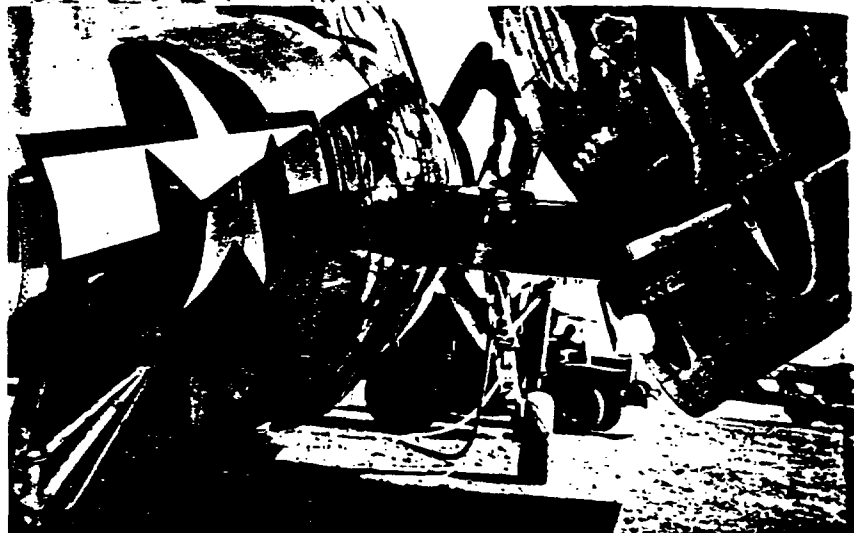


Oil...



Tanks came ashore to carry the battle inland, following capture of an air strip

Wings folded, as on a carrier, this Navy torpedo bomber found itself a new roost on Iwo Jima



Having served its original purpose, Seabees put an empty drum to work as a washing machine

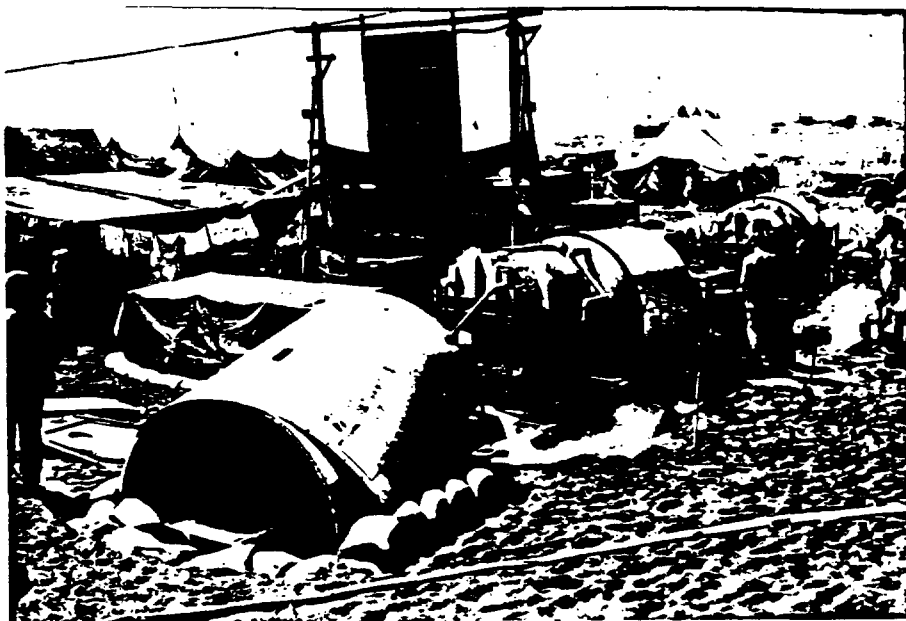


Seabees hook up a gasoline-driven generator to power an electrical system on Iwo Jima. Dragline scoops in the background prepare the ground for installations



at IWO JIMA

Helping to win the battle of Iwo Jima was one job. Now, oil is helping to rebuild the island. And these scenes show some of its seemingly endless uses — powering the water purifying equipment, fueling the gasoline generator that ran the electrical system, driving the bulldozers and other machinery which transformed the Jap island into a new U.S. base. This was oil at Iwo Jima.

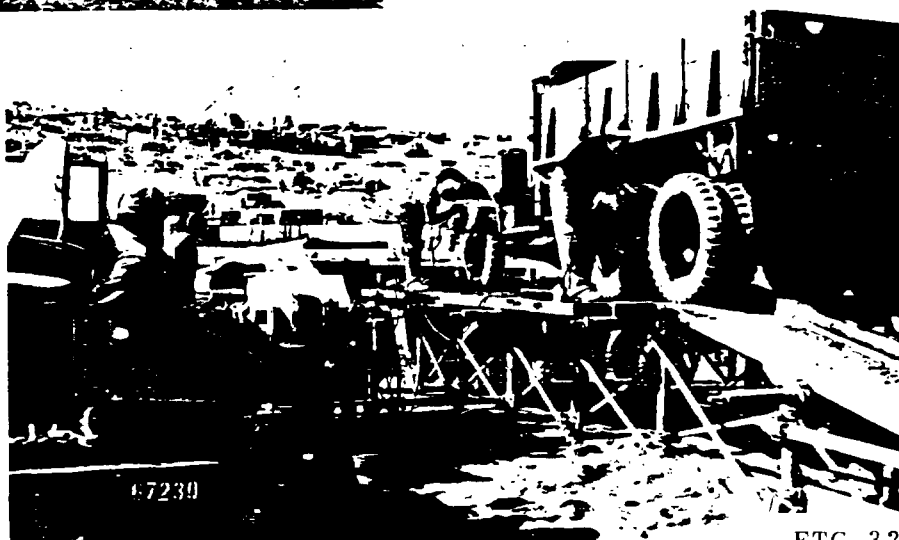


Drinking water from wells on Iwo was non-existent, so our men drew in ocean water, distilled it in this apparatus



Looking down from Mt. Surabachi, where a tractor is at work building a road, a vast panorama of Iwo Jima is seen. Note the network of roads that lead inland from the seacoast

"Open for Business" at Iwo Jima is this GI-operated service station. Rugged driving conditions and combat hazards require constant attention





WHEN *Do* WE EAT?

By John W. Roberts

**In the midst of the current and bewildering food shortages,
here's a timely analysis of what's going on — and a forecast**

IF ANYONE wants to know how much food we'll have to eat this year, and next, the answer is in the clouds.

And that's a fact!

People today are so bewildered over the current food shortages they can understand neither where the food's going — nor where it's coming from in the future. What many don't know is that the kind of weather we have this year — the amount of sunshine and timely rains — will determine more than anything else just how much food we'll have to eat. That's why the answer to the food question, in all truth, is in the clouds.

As a matter of fact, Nature has been so bountiful during the war that it has enabled American farmers to grow the greatest amount of food (and fiber) in history. This has been evident in the record-breaking yields per acre of various crops. Aided, too, by power machinery, which has helped them to overcome their wartime labor shortage, farmers have been able to harvest bumper crops for three years in a row.

This year, the weather was somewhat freakish in March and April. Following a spell of unseasonably warm weather in March, which permitted farmers to make an early start in planting, the heavy rains

and floods in April then caused a setback. However, after surveying the situation, the Government in its May 1 crop report concluded that the general outlook was still for an over-all farm production that will compare quite favorably with the record crops of the last three years. Later reports will bear watching.

Assuming that good weather prevails throughout the rest of the growing season, an improvement in food supplies should be seen beginning next fall and winter. Then will come to market the food and livestock presently growing and grazing. Meanwhile, civilians will have to take still another notch in their belts.

Compared with a year ago, they will receive about 20% less meat and sugar and about 15% less edible fats and oils. This represents the slimmest rations of the war in these commodities — but nobody is going to go hungry.

So much for the future. What about the present grim situation in food? Why have ration point values gone up on meat and dairy products? Why are restaurants shutting down? Why are meat markets in many localities open only one or two days a week, if at all? Why are black markets thriving? Why, indeed, are there these critical shortages in food — when farmers have been growing more food than ever before?

To understand what's happening, you have to take a number of important factors into account. Among them are:

1. Lend-lease and military requirements.
2. Black markets.
3. The unbalance in food supplies.
4. War-swollen civilian pocket-books.

Lend-lease and military requirements have been taking about 25% of the nation's food supply. These are the most vital needs for our food, and no one doubts their supreme importance in winning both the war and the peace.

Although the war in Europe has now ended, huge quantities of American foodstuffs will still be needed by these and other civilian populations of the world, as they are freed, to prevent mass starvation. Europe alone will need to import some 12 million tons of food in the year beginning August 1, according to the Department of Agriculture, most of it from the United States. The liberation of the Philippines has forced American food officials to set aside all supplies of rice in the hands

of U.S. farmers and millers, to feed the people of these islands. All told, the growing needs of the world for American food will more than offset the lessening military requirements involved in the release of a million or so men from the Army. Thus, lend-lease and military requirements will continue to require about 25% of our food supply, if not more, during the coming year, it is estimated.

Growth of Black Markets

Due to the growing shortages of meat, black markets have taken a strong hold on this basic staple. Government authorities reluctantly admit that black market operators have been able to divert between 20% and 25% of all meat, nationally, from legitimate trade channels — although in some sections they have cornered as high as 80% to 90% of all local supplies. The aggravated meat shortage, moreover, has thus enabled the black markets to spill over into poultry and eggs.

Right now, the OPA is waging a vigorous campaign to destroy this black market. It is doing so by attempting to force more livestock

into packing plants where meat is federally inspected. (The Federal Government inspects all meat entering interstate commerce.) The smaller packing plants, not subject to this Government regulation, have been the source of most black market meat, authorities say. If the OPA is successful in smashing this black market, civilians will not get more meat, all told. But they will get more meat at OPA ceiling prices.

The growth of black markets stems at least partly from the fact that food supplies have become unbalanced during the war, particularly in meat.

Most people, in considering the nation's meat supply, think only in terms of the pigs and steers and lambs on farms and ranches. What they sometimes overlook is the amount of corn and grass and other feed grains these herds need to grow and fatten on. During the war, an unbalance was created between the two — the ill effects of which are now showing up in reduced meat supplies for civilians.

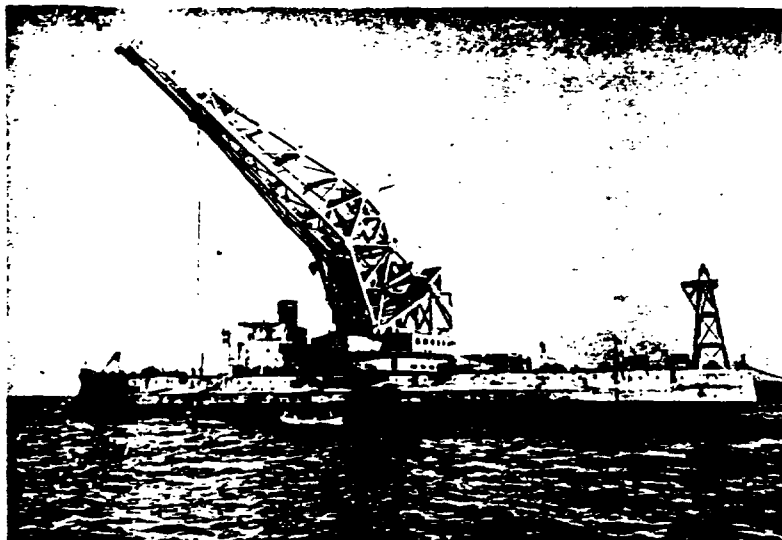
Back in 1943, in response to Government pleas for more pork, farm-

Farmers have been growing more food than ever before in history — but it hasn't been enough to avert shortages



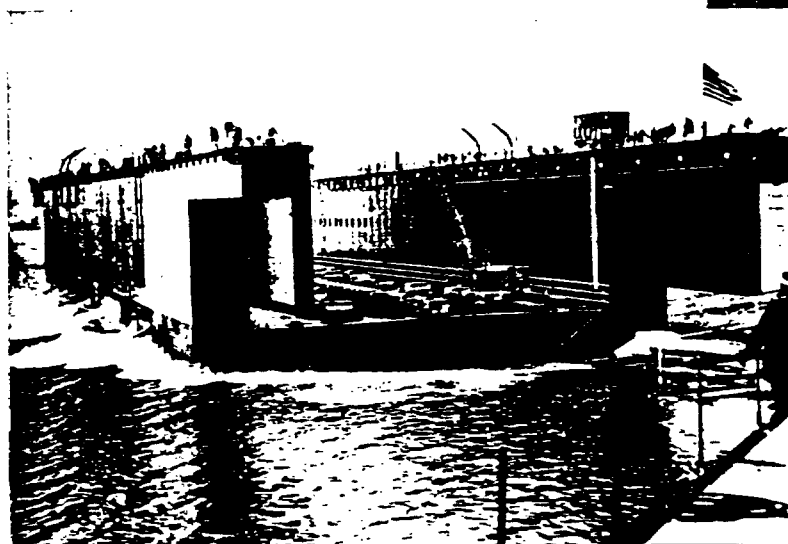


Complete repair and service facilities are to be found inside a Navy auxiliary vessel



This is the USS Craneship No. 1, used in salvage operations. It was once the old battleship Kearsage

A destroyer passing a line to a tanker. Refueling at sea keeps fighting ships in action longer



Our Navy has been able to carry the war to Japan's home shores — thanks to this "secret weapon" that carried the Navy

The Fleet

SALVO! The night is split open with a glory of light and a hell of sound. Tons of high explosive shells, death in steel jackets, fly into the darkness — toward Japan. Those shells are on the last few miles of a journey that began halfway around the globe, in America. Yet the battleship that fired them didn't carry



One of the most amazing auxiliary vessels of the war is the floating drydock. Here is a section of one

Behind the Navy

By North Clarey, Jr.

them from our shores. And when they are all expended she won't have to leave enemy waters to come home for more. An AE ship, one of the Navy train of auxiliary vessels, brought ammunition up into the "front lines" and put it aboard her on the open sea. More shells, rockets, flares, fuzes, bombs, mines, depth charges, even torpedoes, are stored in the holds of this floating arsenal. She can supply the fleet with anything from a .30 caliber bullet to a 16-inch shell — when, and where, it's needed.

Behold, then, the ARS, the AF, the ATF, AOG, AS, APA, AK, the APH . . . Navy initials that spell gloom to Japanese admirals! They stand for "auxiliary" vessels — not fighting ships — and yet they took the place of Guam, the Philippines and the East Indies in our grand strategy of naval warfare in the Pacific. Here's how:

Japanese planning for this war was based on the idea that Nippon herself would be secure from attack as long as she held all the island bases within striking distance of Tokio. So she took every island between her homeland and Australia, intending to have them all developed by the time we could establish adequate supply and service bases for mounting a counter-attack. This line of

reasoning was based on sound military precedent.

Until this war, fleets never attacked further than 1,000 miles from their bases. From Pearl Harbor to Tokio is 3,338 miles. Even when we developed the "task force," the Japanese thought it would have to sail home after each strike.

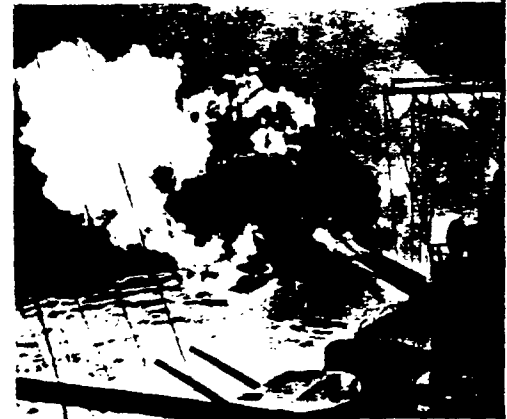
But the Navy put hulls underneath its fuel stations, munitions depots, hospitals, commissary storehouses, and repair shops. *It sent its bases to sea* in the form of auxiliary ships — the "A" fleet. This fleet, a navy within the Navy, was built practically within the last three and a half years — from 85 vessels in January, 1941 to nearly one and a half thousand today.

With these "A" ships we were able to assemble an advance base at any point in the Atlantic or Pacific. *There was no longer a limit to the striking range of our Navy.*

For instance, our task force which helped capture Kwajalein, then went on to hammer Truk and shell Guam, traveled 3,825 miles to return to Pearl Harbor. The entire round-trip rampage took 8,000 miles!

The train of supply ships for the fleet is not a new idea, but we're using them in a new way today. Seventeen out of the Navy's 36 types of auxiliaries have been developed

since this war began. They can supply fuel oil, steel plates, engine bearings, frosted sirloins and succotash, powder, shells, or coke and cigarettes. With their aid a task force was able to protect Guadalcanal for two months without touching land. Even in the early days of the war,



The "A" fleet gives the Navy more reach, punch, endurance

one destroyer operated 140 days in the Pacific without anchoring.

The only thing these floating islands have in common is the initial "A." They run from ATF (Auxiliary: tug: fleet) to APH (Auxiliary: transport: hospital).

The newest type is a distilled-water ship, to service those combat vessels too small to carry a fresh-water plant of their own. It can make 120,000 gallons of sweet water a day and store over 5 million. One old skipper complained that his men were doing poorly on water which had no natural salts, no minerals in it. The Bureau of Ships retorted that no one ever got sick drinking pure water. In military parlance, "the issue remains in doubt."

AD — Destroyer Tender • AE — Ammunition Ship • AF — Storeship (Provisions) • AG — Auxiliary (General-Miscellaneous)
AGP — Motor Torpedo Boat Tender • AGS — Surveying Ship • AH — Hospital Ship • AK — Cargo Ship • AKA — Attack
Cargo Ship • AKN — Net Cargo Ship • AKS — General Stores Issue Ship • AKV — Cargo Ship and Aircraft Ferry • AN
— Net-Laying Ship • AO — Oiler • AOG — Gasoline Tanker • AP — Transport • APA — Attack Transport • APB —
Barracks Ship (Self-Propelled) • APC — Coastal Transport (Small) • APH — Transport (Hospital) • APL — Barracks Ship
(Towed) • AR — Repair Ship • ARB — Repair Ship (Battle Damage) • ARD — Floating Drydock • ARG — Repair Ship
(Internal Combustion Engine) • ARH — Repair Ship (Heavy Hull) • ARL — Repair Ship (Landing Craft) • ARS — Salvage
Vessel • ARV — Aircraft Repair Ship • AS — Submarine Tender • ASR — Submarine Rescue Ship • ATA — Ocean Tug
(Auxiliary) • ATF — Ocean Tug (Fleet) • ATO — Ocean Tug (Old) • ATR — Ocean Tug (Rescue) • AW — Distilling Ship

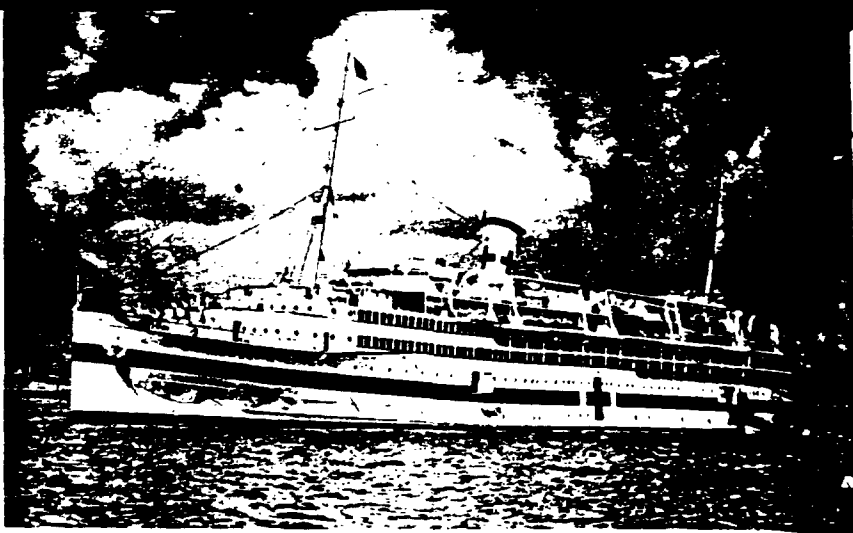
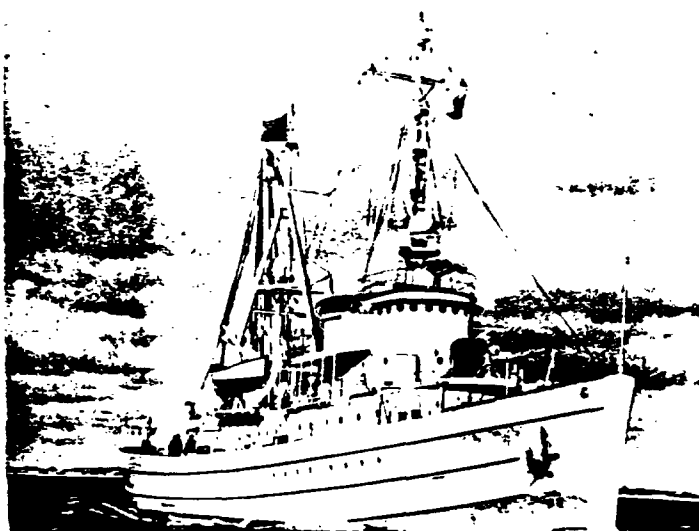
Repair ships, both light and heavy, are floating machine shops that even carry diving gear for underwater salvage. Their mechanics and machine-shop crews now sleep on a separate barracks ship instead of next to their lathes and drill presses as they used to, so the shops can operate 24 hours a day.

The Navy has its own tugboat fleet — four different sizes and types, all equipped with fire-fighting equipment. In more cases than one, burning merchant ships carrying ammunition or gasoline, abandoned by their crews, have been restored to service by these tugs.

ATFs, or fleet tugs, are the most powerful in the world. Over 200 feet long, they have 3,000 horsepower for pulling anything up to a large-sized freighter for thousands of miles. They were designed in anticipation of invasion operations, and actually towed huge railroad barges across the Atlantic in what amounted to the largest towing operation of its kind in history.

Then there are the attack transports (APA) which ferry tanks, tank lighters, landing craft, combat troops and their equipment—a whole invasion—to enemy waters. Their cargo counterparts (AKA) bring in the bulldozers, trucks, gasoline, ammunition and more tanks.

Sturdy, sea-going tugs play a big role in the "A" fleet



Medical care for the wounded and evacuation from combat zones are provided by the Navy hospital ships

Remember the early days of refueling airplanes in flight? Pumping oil aboard a fast-moving warship is just as hard — but our Navy has developed the tankers and the techniques for doing it. And while the fuel is being pumped over, bread, cigarettes, and wounded sailors may be transferred also. It is these fast, long-range tankers that have been so largely responsible for speeding up our naval striking power and increasing its range.

There are special submarine rescue vessels, for pig-boats trapped more than 300 feet down. There are refrigerated food ships, great floating iceboxes.

But the most surprising "ship" in this fleet is the floating dry dock. In sections, huge hunks, these have been towed across the Pacific to advance bases. And the dry docks are huge

— larger than the average football stadium. Some of these basins, towed all the way across the widest expanse of ocean on earth, will accommodate the 45,000-ton *Iowa* or *Missouri* — heaviest, mightiest battle-wagons in the world! There is, in this fact, a businesslike suggestion of future operations that has them scratching their heads over in the Japanese admiralty.

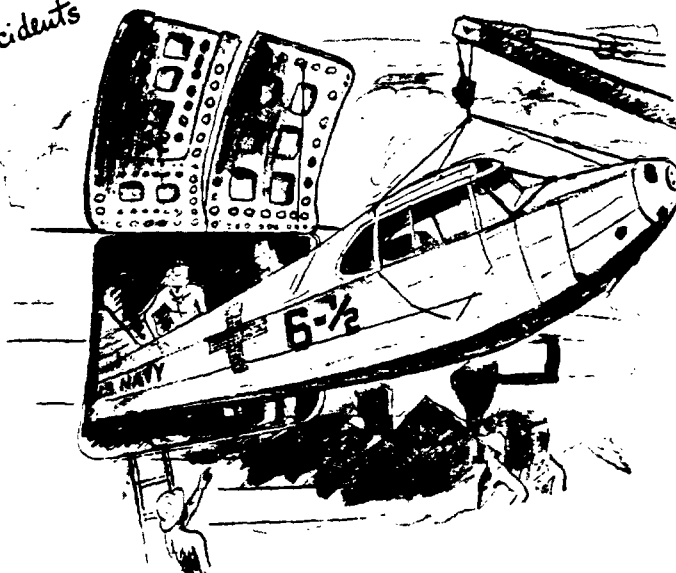
Another fact that disquiets the admirals is that over 30% of our Navy, by far the world's largest, is composed of "A" ships. They don't have the glamor of destroyers, cruisers, carriers. They haven't made the headlines. But they've done a whale of a job. By giving our fighting ships more reach, more punch, more endurance, they've given us bases for carrying the war right into the Emperor's front yard.

OUR PICTURES . . . Cover, Official U. S. Navy photograph; Pages 3-5, courtesy *Aviation Magazine*; Pages 6-7, courtesy R. M. Wade & Co., Portland, Oregon; Pages 8 (top), 9, 10 (top), 11, 19, and 22 (bottom), Acme Newspictures, Inc.; Page 10 (bottom), courtesy U. S. Rubber Co.; Page 12 (top), Official U. S. Navy photographs through Press Association; Page 12 (bottom), 13 (center right and bottom), 14 (except top), 15, 16, and 20 (top), Wide World; Pages 13 (top and center left), 14 (top), 20 (bottom), and 22 (top), Press Association, Inc.; Page 17, courtesy Soil Conservation Service, U. S. Department of Agriculture; Pages 20 (middle two) and 21, Official U. S. Navy photographs.

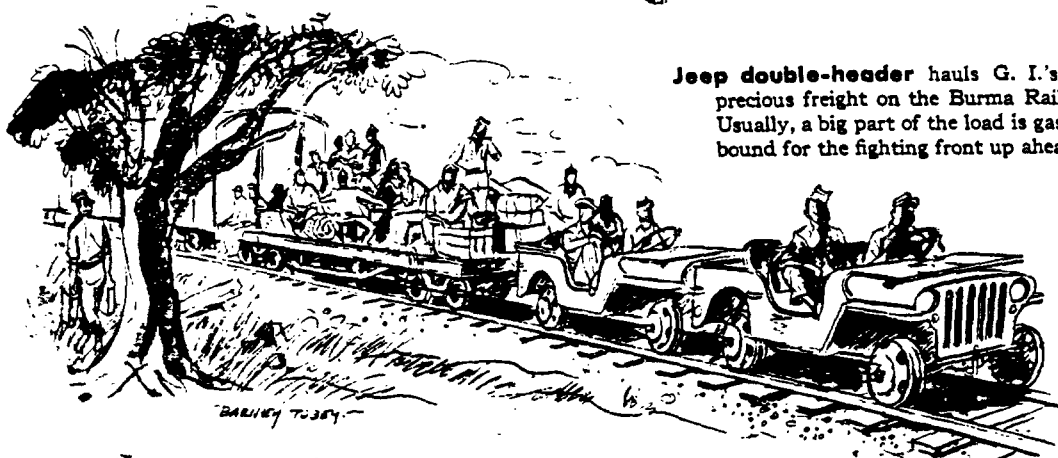
THE BEST GASOLINE IS STILL FIGHTING !

*Rough impressions
of gasoline's role on the
battle-fronts - based on actual incidents
and official photos.*

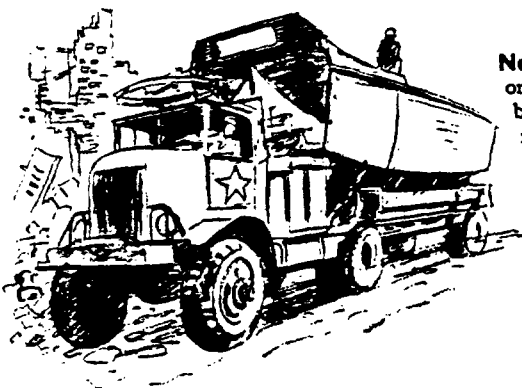
A Curtiss Commando carries
Cub hospital planes two at
a time, kangaroo-style. To
fly this load, plus a ton of
priority equipment, high
octane gasoline is essential.



Jeep double-header hauls G. I.'s and
precious freight on the Burma Railway.
Usually, a big part of the load is gasoline
bound for the fighting front up ahead.



Navy boats don't always ride the waves. This
one, for example, goes overland on the sturdy
back of an Army truck. Ashore or afloat, mecha-
nized equipment in this war needs gasoline of
the finest quality and plenty of it.



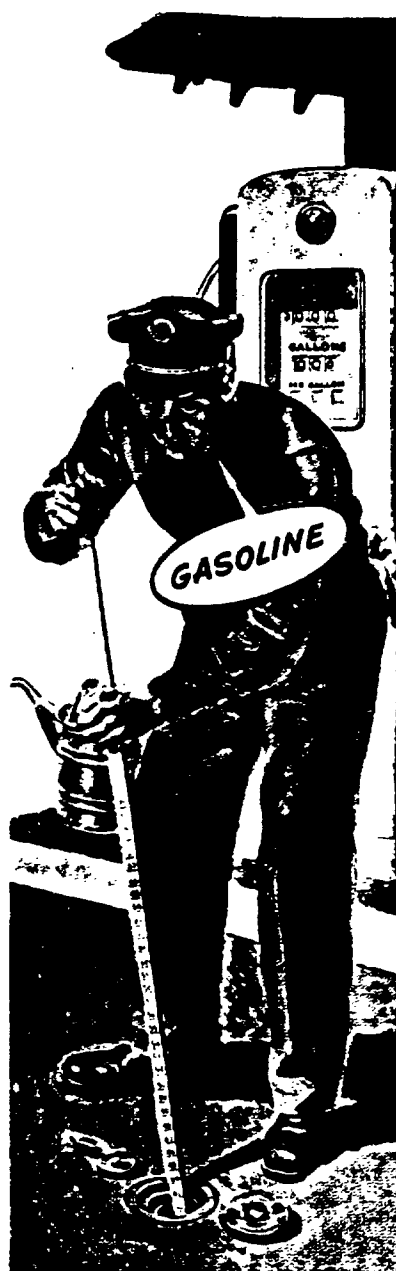
KNOCKING OUT a tough enemy is a job that
takes men, machines and supplies — including
huge quantities of the best gasoline that Ameri-
can refiners can produce—gasoline improved
with Ethyl fluid.

So long as the best gasoline "is still fighting,"
gasoline allotted for civilian use must be restricted
as to quality as well as quantity. Lessened mili-
tary needs may ease the situation a bit, but the
lifting of all restrictions cannot be expected un-
til complete, final Victory.

ETHYL
CORPORATION
CHRYSLER BUILDING
NEW YORK 17, N. Y.



Ethyl is a trade mark name



Everybody knows why gasoline supplies at home are still limited. It's easy to understand that, with millions of gallons of gasoline going overseas, civilians can't have all the gasoline they want.

"But," you may ask, "why isn't the gasoline I am getting up to pre-war quality?"

The answer to that is also quite simple. *The best gasoline is still fighting!* Our fighting men are getting the cream of U.S. gasoline production, which contains most of the Ethyl fluid manufactured.

Result—gasoline left over for civilians is likely to be short on quality as well as quantity until such time as the Army and Navy say it's safe to step up civilian supplies again. Then you can look forward to the finest Ethyl gasoline ever offered.

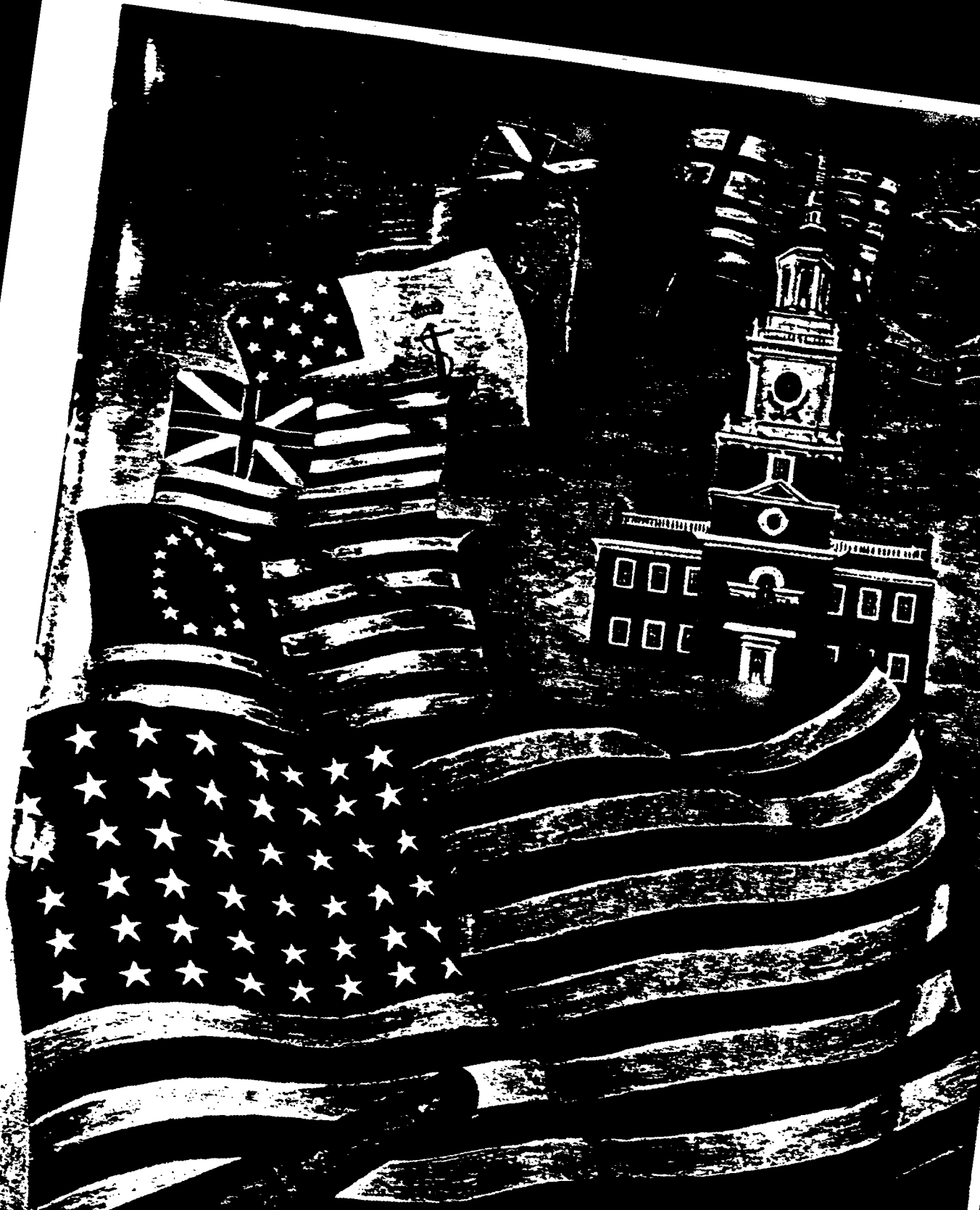
ETHYL
CORPORATION

CHRYSLER BUILDING
NEW YORK 17, N. Y.



Ethyl is a trade mark name

ETC 32133



ETC NEWS

JULY ★ AUGUST ★ 1945

ETC 32134



IN THE

ETHYL NEWS

JULY-AUGUST

What we know as the American flag actually is derived from many others of the Colonial period, some of which are shown on our cover. Viewing these flags from right to left, one can see how our present flag evolved.

First there is the Washington coat-of-arms. Legend has it that this was the flag's basic inspiration, since it contained both stars and stripes.

From the English East India Company flag (next) came the precedent for the use of thirteen stripes (to symbolize the thirteen colonies). It was probably also the original inspiration for the canton — the upper lefthand corner where we now have the stars. However, the Red Meteor flag of 1707 (third), the official British colonial flag with its Cross of St. George and St. Andrew in the canton, was the one on which succeeding designs were superimposed.

The first American flag to incorporate alternate stripes — but blue and silver — was the fringed flag of the Philadelphia Light Horse Troop (fourth) in 1775. Stars first appeared in the white "Hope Flag" of Rhode Island (fifth).

Following the outbreak of the Revolution, the Striped Union flag (sixth) was adopted — which gave us the arrangement of alternate red and white stripes. Two years later, the last great change was made — the substitution of stars in the canton, for the Cross of St. George and St. Andrew — and the "Betsy Ross" flag (seventh) was born. This was the first official U. S. flag, but Betsy's part in its creation was more fiction than fact.

The ring of stars ultimately gave way to the arrangement first seen in the Rhode Island flag. And from this form our present flag has come about.

ETHYL SALES DEPARTMENT REDESIGNED 3

In order to serve its customer oil companies better, Ethyl's sales department has been redrawn to conform more closely with the principal gasoline marketing areas of the country. An area sales manager will serve each territory.

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Going away on your vacation? Here's how to add a professional touch to your snapshots, by remembering a few simple rules.

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What makes the comics the best selling features in newspapers? Nearly everybody reads them . . . and loves them.

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Does the dirigible have a place in postwar air transportation? Here's what its proponents believe.

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

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

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

Earle W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzalez, secretary

ETHYL SALES DEPARTMENT

Reorganized

FOR BETTER SERVICE

Four area sales managers appointed to coordinate sales activities in line with gasoline marketing areas

AS A RESULT of a ten-month study to determine the postwar requirements of customer oil companies, Ethyl Corporation Sales Department has reorganized its field operations to conform more closely with the four principal marketing areas for the sale of gasoline.

The new plan is designed by J. Coard Taylor, Vice President in charge of Sales, and Julian J. Frey, General Sales Manager, to enable the Corporation to give the best possible service to customers and to secure closer coordination of activities

affecting customer sales programs.

In line with data and information developed by an analysis of the operations of customer oil companies, the reorganized sales department of the Corporation has been set up on the basis of four marketing areas to be known as the Eastern, Central, Southern and Western areas.

As a further step in achieving better coordination with the marketing activities of the oil companies using

Ethyl fluid in their products, a sales manager has been appointed for each of the four areas.

The four appointees are Richard C. Murphy, Eastern Sales Manager; James E. Boudreau, Central Sales Manager; Harold R. Berg, Southern Sales Manager; and Sanford M. Wagner, Western Sales Manager.

The sales manager of each marketing area will be directly responsible for services rendered to all customers in the area, and therefore



Harold R. Berg



Richard C. Murphy

ETHYL'S FOUR NEW AREA SALES MANAGERS

James E. Boudreau



Sanford M. Wagner



MR. BERG, who was born in Manchester, N. H., went to the public schools of Portsmouth and entered the University of New Hampshire in 1923. Upon completing his college course he joined the Portsmouth District of the Mexican Petroleum Corporation, serving as operating manager until August, 1928, when he joined the Ethyl Corporation as a field representative of the Chicago Division in the Northwest territory. In 1930 he was appointed Assistant Manager of the Chicago Division and six months later he became Manager of the newly-organized Kansas City Division. With the exception of a year in the New York office on special assignment, Mr. Berg has been in charge of the Kansas City Division for fifteen years.

MR. BOUDREAU, successively Manager of the New York and Chicago Divisions, served in the U. S. Army for two years in the current war and rejoined Ethyl Corporation last December after his release from duty as Lieutenant Colonel with the Sixth Service Command.

He was born in Hoboken, N. J., and was graduated from the U. S. Military Academy at West Point in 1925, resigning his commission after a year's service to join the Munson Steamship Company. Four years later he became associated with the Ethyl Corporation as a representative in Eastern New York State, serving subsequently as Manager of the New York Division from 1932 to 1936 and of the Chicago Division from 1936 until he entered the army in November, 1942.

MR. MURPHY joined the Ethyl Corporation in 1929. After serving as a field representative in the Baltimore, Boston, Atlanta and New York Divisions, he became Assistant Manager of the New York Division in 1935 and Manager of the same division in June of the following year. In 1941 he was appointed Western Regional Manager for the five divisions in the West and Midwest, comprising Chicago, Kansas City, Tulsa, Seattle and Los Angeles. Mr. Murphy was born in Olean, N. Y., and went to grammar and high school in that city. He attended Cornell University and for a year before joining the Company was with the National City Bank of New York.

MR. WAGNER, a native of Williamsport, Pa., received his early education in the schools of Auburndale, Mass., and Newton, Mass., and was graduated from Rensselaer Polytechnic Institute at Troy, N. Y., in 1912. After engaging in farming in Florida for four years, Mr. Wagner joined the Standard Oil Company of New Jersey where he served for ten years until he joined the Ethyl Corporation in 1926. He pioneered in the development of Ethyl sales on the West Coast, establishing division offices in Los Angeles. His new assignment includes all territory west of the Rockies.

will be in charge of all sales activities of Ethyl divisions within the marketing area.

In addition to the four area sales managers, George Krieger has been named to the new post of Special Assistant to the General Sales Manager to coordinate programs affecting more than one of the four principal areas and to supervise certain services to customers which can be handled adequately only on a national basis.

Major objectives of the new plan of reorganization are:

1. Coordination of services throughout each customer's marketing territory.
2. Superior service to customer companies by giving a wider scope to specialists in the sales organization.
3. Closer liaison between customers and Ethyl sales divisions.

Each sales manager will supervise the activities of Ethyl Corporation sales divisions operating in his area. Under the reorganization, the line-up of divisions by areas is as follows:

Eastern Area: New York and Philadelphia Divisions.

Central Area: Kansas City, Chicago and Dayton Divisions.

Southern Area: Tulsa and Atlanta Divisions.

Western Area: Los Angeles and Seattle Divisions.

The Eastern Sales Manager will have his headquarters in New York, the Central Sales Manager in Chicago, the Southern Sales Manager in Tulsa, and the Western Sales Manager in Los Angeles.

Donald S. Flynn, formerly Assistant Manager of the Kansas City Division, has been promoted to Manager of the division to succeed Mr. Berg, Southern Sales Manager. Mr. Wagner will retain, for the present, his position as Manager of the



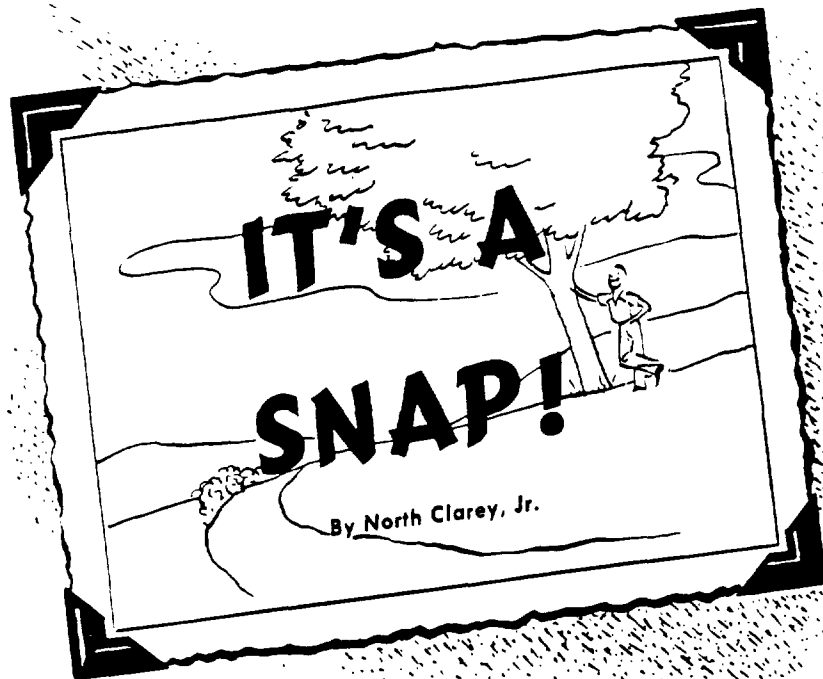
George Krieger

After a two-year leave of absence with the War Production Board, Mr. Krieger returned to Ethyl this year to take charge of rural marketing and special development work as assistant to Mr. Frey. While with the W. P. B., Mr. Krieger served as Chairman of the Farm Machinery and Equipment Division and later as a special assistant to Donald M. Nelson. A native of Virginia, he was graduated from Virginia Polytechnic Institute in 1926 as an agricultural engineer, and entered the employ of Standard Oil Company of New Jersey refinery research laboratories. In 1929, he joined Ethyl Corporation as an agricultural engineer, and in 1932 was named Director of Tractor Activities in the Technical Sales Department. Before leaving to serve with the W. P. B. in 1942, Mr. Krieger was head of Ethyl's Agricultural Division.

Los Angeles Division while serving as Western Sales Manager.

Matthew A. Taylor, former Manager of the Boston office, has been appointed Manager of the newly created division in Philadelphia. The services formerly rendered by the Boston office have been transferred to the New York Division.

Although designed as a postwar measure, the reorganization is effective immediately in order to enable the Corporation to take preliminary steps which will give the maximum amount of service and assistance to customers in their readjustment of operations from a war to a peacetime basis.



You, too, can have that professional touch in your snapshots — if you remember these few simple rules

Wish I had my old Brownie back!"

And Louie will come in for his prints, spill a mess of vague images out on the counter, and beam at the clerk. "That one's my wife. You can tell — she had the plaid coat on."

What a waste of precious film!

What's worse, *what a waste of fun!* You know, and I know, the fascination of old photographs. We can't run across an envelope full of forgotten snapshots in the back of a drawer without taking time out to study them, maybe show them to the first person who walks in on us.

Louie and J. Perkin know the same thing — but not one of us in a dozen realizes that we could get three times as big a bang out of our pictures later on if we only checked ourselves on one or two points before we punched the little button,

Louie and his wife are pushing the baby carriage along Riverside Drive on a Sunday afternoon. "The sun's nice and bright, Louie," she says. "Let's take a pitcha." So they pull the old box camera out from under the thermos bottle in the carriage, and she holds the baby, squinting into the sun, while Louie backs off 20 feet down the sidewalk, makes sure that the sun is behind him, warns his wife to "Hole still, now!" and snaps the little lever on the side of his camera. Louie walks back to the carriage with a certain strut. He has just made a Pitcha.

Fifty feet from him, Mr. J. Perkin Perkins puffs on his cigar as he perches his youngster on the fender of his Lincoln. And he walks 20 feet toward the sun while he scowls at the gleaming mystery of dials, F-stops, and chrome plated shutter speed selectors on the camera slung around his neck. He fusses with this and that. "Steady, dear. Smile now. Tell little Perkin to look at Father." He snaps the scene with a grunt.

"Ought to make a good picture," he says, strutting back to the car. "A-hmph! Quite a picture!"

J. Perkin doesn't know it, but he hasn't got a work of art. He just made another Pitcha. When the man in the drugstore hands him a brown envelope full of prints next week, he will scowl at the blurry images and confide to the clerk, "That complicated, no-good camera of mine!"



or pushed the shiny lever, that takes the picture! Your summer vacation is upon you. Why not come home with better pictures of it?

Don't stop reading now. This is not going to be a treatise on photography, full of chatter about orthochromatic emulsions, or dynamic symmetry in composition. This is just a couple of hints, from one old box-camera snapper to another, on how to get more fun out of your photos. No trouble involved, no scratching of the head — it just calls for you to understand a couple of mistakes which can be recognized ahead of time and avoided.

(1) **STAND CLOSE.** Don't follow the example of Louie and J. Perkin Perkins. They backed off 20 feet (remember?) and then squinted into the little finder-windows of their respective cameras until they spotted the diminutive figures of their families in the middle of the finder. These wives and babies will look just as tiny, just as distant, in the finished pictures, as they did in that finder. Stand always as *close* as you can, so you don't have the top third of your picture showing sky (or an apartment building) and the bottom third showing sidewalk or plain grass. Come in close — till your subject fills the little finder-window — and in the picture all the faces will be clear enough to show expression, personality.

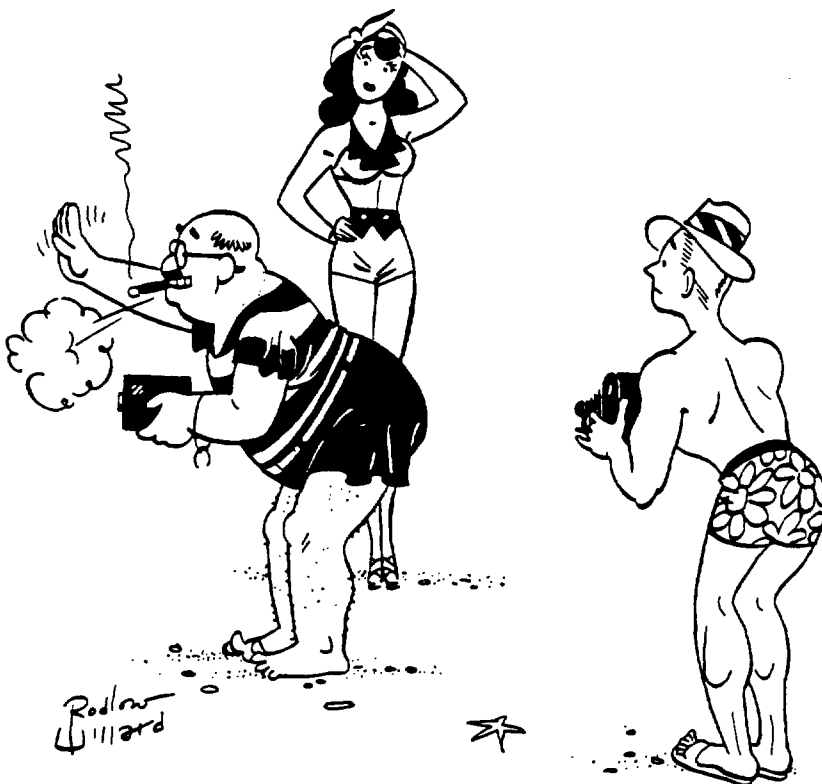
(2) **DON'T GET YOUR BACK TO THE SUN.** Why people think that's "the right way" is the greatest mystery outside of where-did-all-those-cigarettes-go? It's a simple matter of reflected light rays. A person with his face square to the light will have a flat expression, practically no shadows on his face except unflattering ones under the eyes and nose. Let the light hit your subject a little sidewise, and you get the faint shadows which give your picture

a portrait-like clearness and true-to-life quality. For an easy rule of thumb, stand with your *shoulder*, not your back, to the sun. Another good point is that the person whose image you're putting immortally on paper won't be scowling or squinting at the sun.

(3) **MAKE YOUR SNAPSHOTS "NATURAL."** When a person is told to

ture" as if for a firing squad. The same goes for a group photo — don't line people up in a stiff row. Catch 'em off base — that's good in baseball, and it's good in photography.

So now you know the basic principles of snapshottery: Get close, so people look big in the picture. Stand with your *shoulder* to the



"Look at the camera, now," he or she gets self-conscious and fidgety and stiff. Here's the tip, friend: get your picture-box all set, then tell the victims to go on and do what they were just doing. A woman with her mouth open is more natural, more true-to-life, in a photo than a woman with her lips pressed nervously together. Your friend Jerry, biting a hot dog and roll, will look more like good old Jerry two years from now than he would if you had him brace himself "for a pic-

ture" as if for a firing squad.

Whether you use the safe and sane box-type camera, or a fancy model with numbers all over it and one that comes in a leather holster, these are basic points. Want more? There are some other booby-traps to look out for:

(4) **DON'T UNLOAD OR REFILL YOUR CAMERA IN BRIGHT LIGHT.** Film is fairly "safe" today — you don't have to stumble around a murky closet or crawl underneath your Oldsmobile to put in a new



roll — but still don't take it for granted the film is foolproof, or you-and-me-proof. Bright light will seep in around the edges of your film when you relax your grip on the little spool, and louse up your artistry. Stay in the shade when you load. Hold the roll tight.

(5) DON'T SET YOUR CAMERA DOWN ON THE BEACH, OR IN A DUSTY SPOT. All picture-boxes have moving parts which dust will injure. Put yours on a chair or towel.

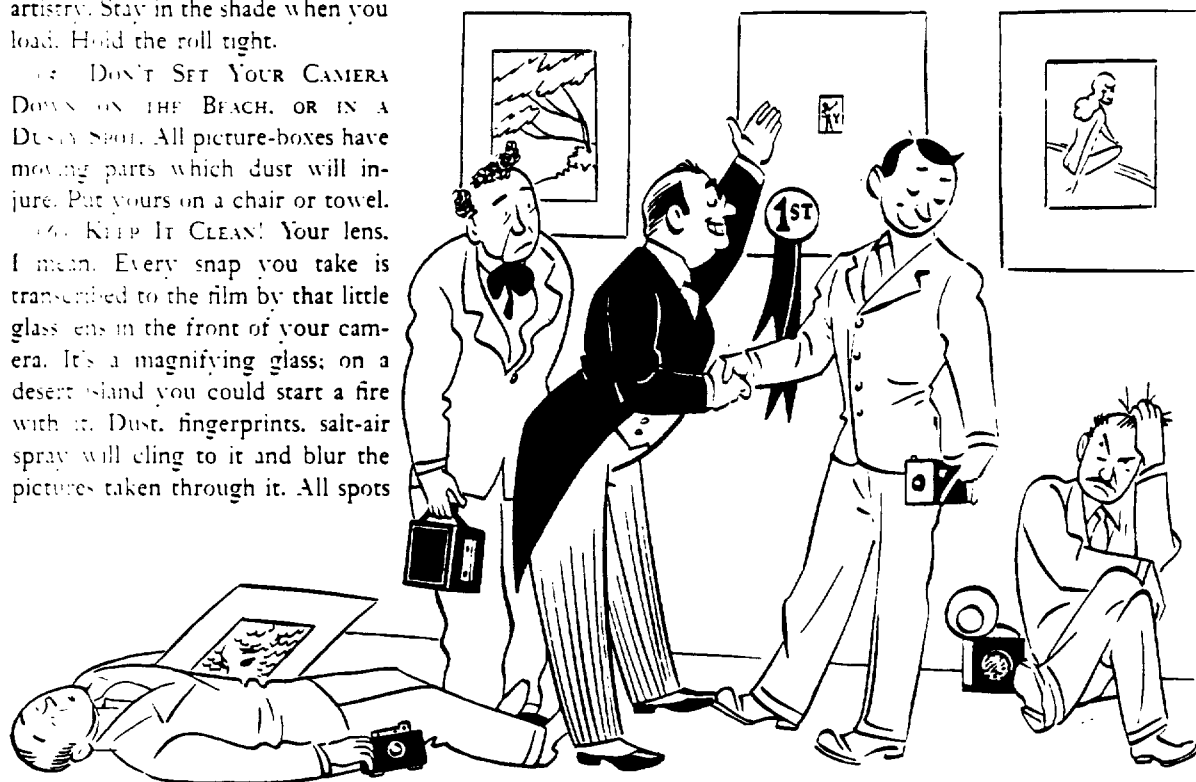
(6) KEEP IT CLEAN! Your lens, I mean. Every snap you take is transcribed to the film by that little glass lens in the front of your camera. It's a magnifying glass; on a desert island you could start a fire with it. Dust, fingerprints, salt-air spray will cling to it and blur the pictures taken through it. All spots

will be magnified. Every so often, take a clean corner of your handkerchief and wipe it gently till it shines.

(7) DON'T PUNCH THAT BUTTON! Whatever kind of trigger your cam-

era has to make it go off, don't set it off quickly. Your hand will make the camera jump at the instant the picture's being taken — and if the camera moves, it's just the same as if every one in the photo had moved. Do as pistol experts do — *squeeze* that trigger, slowly!

(8) AT LAST — WHEN YOU TAKE YOUR FILM IN FOR DEVELOPING—ASK FOR "GLOSSY" PRINTS. You want clarity, detail — right? Photo shops automatically give you "dull finish" or "soft finish" pictures because they're more flattering. If you just remember to avoid the "booby traps" we've mentioned, your pictures will be good enough not to need the fuzzy, vague flattery of "soft finish" prints. Ask for "glossy prints" (they cost no more) and your shots will look so professional when you spill them out of the envelope that you'll probably try to impress the man at the counter with them!



The war's heavy drain on oil reserves accumulated in peacetime highlights a serious problem of the industry

EVERYONE KNOWS that U. S. oil is winning the war — but few people realize *what kind* of oil is responsible. Somehow, the prevailing impression seems to be that the stream of petroleum products flowing to the battlefronts stems from crude petroleum discovered yesterday, a week or month ago, or last year. Actually, of the billions of barrels upon which this war is being fought and won, only one out of every twelve barrels consists of oil discov-



Oil OFF THE SHELF

By Henry E. Rose



ered since the time of Pearl Harbor.

This highlights a deeply serious situation that has been developing in the oil industry during the war.

To meet the unprecedented demands for oil, the industry has had to cut deeply into its peacetime reserves and, in effect, to sell its "oil off the shelf." How much oil is involved is revealed in a recent official government estimate. That estimate showed that of today's total crude production of close to 4.8 million barrels, only about 400,000 barrels come from oil reserves discovered since Pearl Harbor. The rest of it comes from oil previously discovered in peacetime.

What makes this of such deep concern to the industry is that this represents oil which cannot be replaced for less than three to four times what it cost originally. At the

same time, the industry has been faced with a declining rate of new oil discoveries in recent years, despite the most intensive search for oil in history. In consequence, it has sought relief from this situation through a general increase in the price of crude oil.

Yet, throughout the entire period of the war, the OPA has failed to take cognizance of the industry's untenable position. Since 1941, it has permitted no material advance in the price of crude oil — despite the advance in the cost of materials and equipment, despite the increase in labor costs and in taxes, and despite the fact that the industry has been forced into the position of liquidating its peacetime reserves. The only

relief the OPA has granted has been in the form of subsidies to high-cost, small producing wells.

In recent months, any number of oil company executives have called attention to this disparity between selling prices and replacement costs.

Addressing his company's stockholders early in June, Ralph W. Gallagher, chairman of Standard Oil Co. (N. J.), said that the present high production is making heavy withdrawals "upon crude oil reserves accumulated in pre-war years. Our costs of finding oil then were very much lower, it now appears, than they will be in the future. The earnings we are showing, therefore, might be deceptive, since they cannot reflect the probably higher fu-

Nearly all of the U. S. oil fueling the war comes from reserves discovered in peacetime

ture costs of replacing our crude oil reserves."

Similarly, Eugene Holman, president of Jersey Standard, said: "We are simply taking our stock off the shelves and selling it. We can't replace our crude reserves at the prices they were found originally, so that we think, looking into the future, and to keep our crude oil reserves on an ascending scale, we will have to get more for crude and a corresponding increase, naturally, for products."

Said the president of a mid-continent company: "The oil we are now producing cannot be replaced in our reserves at the prices we are receiving. In plain terms, we are living on our fat acquired in earlier years from bigger, better and less costly discoveries and acquisitions. Our position is like that of a farmer who bought a farm and thinks he is making a fine deal selling for \$5,000 a farm which cost him \$5,000. Then he finds that he cannot acquire for less than \$10,000 a farm on which to continue his business."

Sure, we are making higher profits this year than last, said the head of another company, and yet "at the same time we are going out of business. We cannot acquire new reserves to be sold profitably at today's prices for crude oil."

Status of Crude Reserves

To understand what's going on, it is necessary to absorb a little economics about the oil industry. This involves a knowledge of several relationships — between crude reserves and crude production; between the volume of drilling activity and the percentage of dry holes drilled in the process; between the costs of finding oil and the selling price. It is not easy to explain these relationships — nor for a layman to grasp them. Yet, collectively, they are the crux of the problem.

Take the subject of crude reserves.

At the beginning of 1940, the nation's oil reserves stood at a figure of 18,483 million barrels. Since then, a total of 9,293 million barrels were added. Of this total, however, revisions and extensions of previously discovered fields accounted for fully 7,523 million barrels; only 1,770 million barrels consisted of strictly new discoveries. And after allowing for the 7,323 million barrels of oil that were consumed in the five-year period, there was a net addition of only 1,970 million barrels, for a total of 20,453 million barrels at the beginning of 1945.

Discoveries vs. Demand

But here is the significant point: The strictly new oil discoveries of 1,770 million barrels were equal to only one-fourth of the amount of crude oil that was consumed in that period. In other words, we used up four barrels of oil for every single new barrel that was discovered.

Take last year's experience as an example.

Then, reflecting the intensified search for oil, a total of 511,308,000 barrels in absolutely new reserves were added. In physical volume this represented the second largest addition since 1937 (but it was small in comparison with years prior to 1937). But compared to a 1944 crude production of 1,678 million barrels, the virgin oil discovered represented only a little more than 30%. This is a slightly better showing than in any year back to 1938 (1941 also had about 30% discoveries to production). But were it not for the extensions and upward revisions in previously discovered pools, there would have been a definite liquidation of reserves. (As with previous years, the 1944 discoveries will of course be eventually revised upward, as additional wells are drilled and the fields are fully outlined.)

What about the cost of finding oil?

Most companies prepare cost analyses of their operations, and these give a fair indication of the amount of money they spend in seeking to replenish the nation's crude oil inventory. For the industry as a whole, however, replacement costs are not readily available.

Exploratory Costs Higher

In such studies, the "finding" or "exploratory" expenditures only are used. These include the cost of acquiring and carrying leases, the cost of maintaining land departments, drilling and equipment costs, geological and geophysical costs, and overhead expenses connected with these operations. Field development and production costs are not considered as replacement costs.

The new oil found in the five years since 1939, when the war began in Europe, has cost the American industry from 50 to 60 cents a barrel, according to official estimates. A few companies even show a slightly higher cost. In any event, they compare with a cost of 10 to 20 cents a barrel in pre-war years, say, up to 1937.

A little more than a year ago, the Petroleum Administration for War furnished an official estimate of finding costs. In support of the oil industry's request for a general crude price increase, the PAW gathered and submitted data covering oil industry expenditures for exploration. And these costs, it found, have moved sharply upward since 1940, rising from an average of about 18 cents a barrel to a little more than 60 cents a barrel by 1943. In contrast, the PAW said that the average finding cost in the years 1934-36 ranged from only 12 to 15 cents a barrel.

Thus, the PAW's survey showed the cost of replacing crude reserves during the war had at least trebled.

and probably quadrupled, as compared with pre-war years. A leading oil economist, in analyzing the replacement cost for 1944, found it to be near 60 cents a barrel — a four-fold increase as compared with 1937.

Back of these higher costs is the sober fact that there has been a declining rate of new oil discoveries in recent years.

As any geologist will tell you, it takes considerably more drilling to discover oil than ever before. New fields are smaller than at any time in the history of the industry, and this, from the standpoint of initial production, is an important factor in exploratory costs. (For example, a survey estimated the initial production per oil well, in the first half of 1943, at only 180 barrels; in 1940, it was 370 barrels and in 1937, it was 460 barrels.) Then too, there are higher geophysical and geological costs. Wells are being drilled deeper, and the cost of drilling equipment and of manpower is higher.

The Independent Petroleum Association of America found that it cost \$37,000, on the average, to drill an oil well, in 1943, after allowing for dry hole losses. That same well would have cost you only \$27,182 in 1940, \$26,183 in 1937, according to the IPAA. This, then, is one measure of how costs of finding oil have risen.

At the same time, there has been a steady increase in the proportion of dry holes drilled in relation to producing wells, particularly in recent years. This indicates the degree of added risk forced on the industry by wider well spacing requirements, and has been an important factor in the tremendous increase in replacement costs. During 1944, for example, an estimated 9,166 dry holes were drilled — the highest on record. These dry holes were equal to seven out of every ten oil wells drilled in that year — and you don't make

money on dry holes. In contrast, only one out of every four or five wells drilled was a dry hole, in the years 1937 to 1941.

Technology's Role

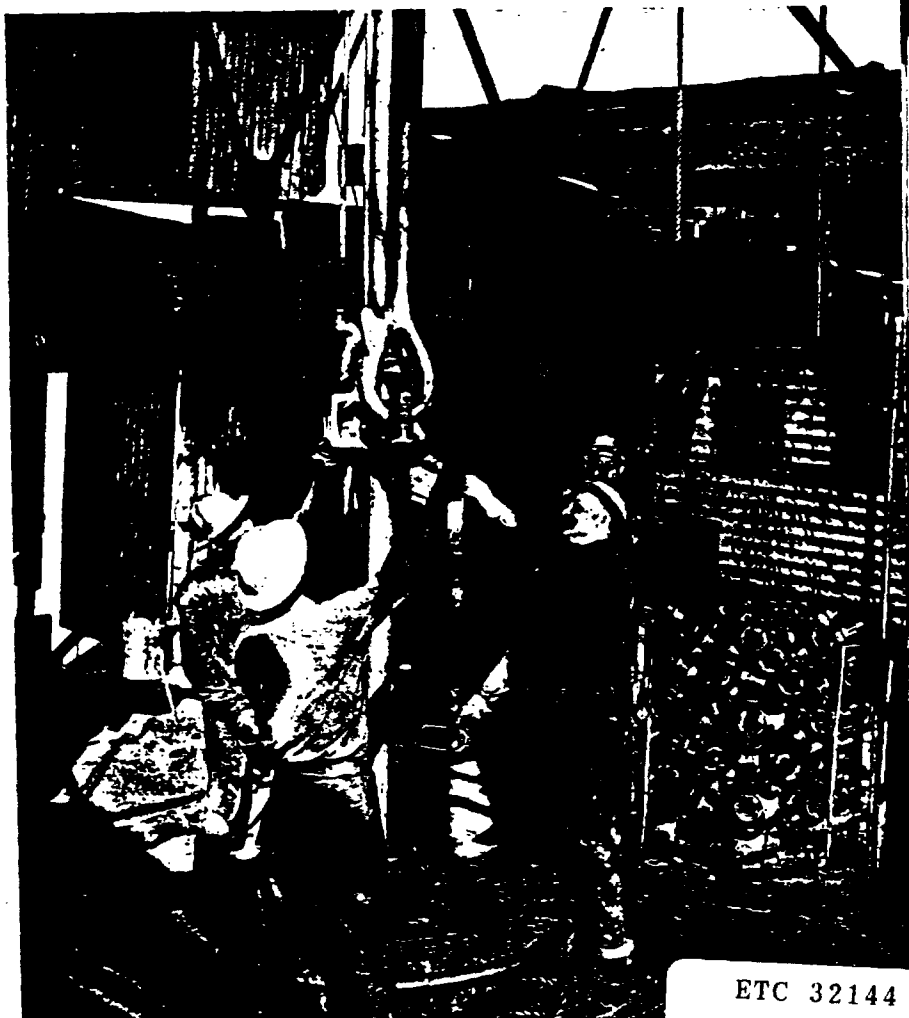
Probably the only redeeming feature about the search for oil in recent years has been the part that technology has played in increasing the yield from fields that have been discovered. Commenting on this, Dr. Robert E. Wilson, chairman of Standard Oil Co. of Indiana, said that where once 70% to 80% of the oil was left in the ground, usually not more than 30% to 40% remains today after the pumps have been pulled. But, significantly, he added that "despite all improvements in

methods of finding and producing oil, the returns per unit of effort are diminishing."

Today, the oil industry is showing good operating profits, reflecting its unprecedented volume of business. But these aren't profits in the ordinary sense — because, while making them, the industry is being forced to liquidate reserves which cannot be replaced at their purchase price. It is in the same position as any business which cannot replenish its stocks on a profitable basis.

As it continues to liquidate its low-cost oil discovered in peacetime — and is forced to utilize more fully its higher-cost oil — prices are going up, under the compulsion of events.

Despite the most intensive search in history, recent years have seen a declining rate of oil discoveries





Dive bombers spotted on a carrier's flight deck. Flat-tops also carry torpedo planes and fighters

Flat-tops



AIRCRAFT carriers have spearheaded the Navy's drive across the Pacific. From those perilous days of 1941, when the whole course of the war was touch-and-go, down to the present time, when our Navy can operate with impunity in Japan's home waters, the carriers have been in the thick of virtually every major action. In the Pacific war, as never before, the flat-tops have come into their own as first-line fighting ships.

At Pearl Harbor, the major part

of our original battle fleet had been sunk or damaged. But almost unknown is the fact that our carriers then in service were safe at sea, thereby escaping the holocaust. This was perhaps our greatest good fortune. For in the critical months that followed, the flat-tops provided most of our staying power in the Pacific.

In 1942 they played a supreme, though sacrificial, role in the Battle of the Coral Sea, at Midway, in the battles off the Solomons; four car-

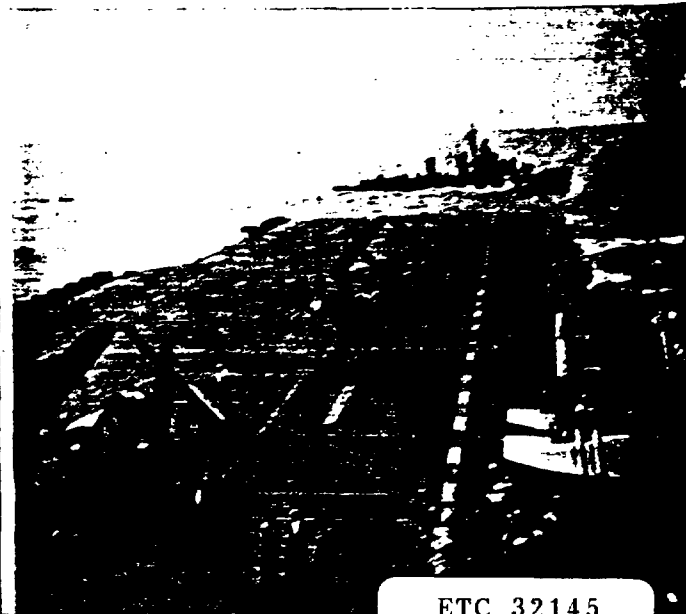
riers — the *Lexington*, *Yorktown*, *Wasp*, and *Hornet* — were lost. At the peak of the struggle for Guadalcanal, our carrier fleet had been reduced to a single fighting flat-top. But Guadalcanal turned the tide — our way.

Since then, our carrier actions read like a chronology of the Pacific war. They include the Gilberts, the Marshalls, Truk, Saipan, Tinian, Guam, the Palaus, the Bonins, Formosa, the Philippines. The Navy's sweep

Mechanics take a fighter plane in tow for a checkup, preparing it for its next mission



Deck men spot a pair of dive bombers on the flight deck. Off to the right is an AA battery



U.S. Navy



A unit of Uncle Sam's carrier fleet, which now totals 26 combat carriers and 65 escort carriers

across the Pacific culminated in the Second Battle of the Philippines — the greatest naval battle of all time — in which 19 Jap warships and four carriers were sunk by our air and sea forces. In this action, our carriers scored a smashing victory.

At the same time, the home islands of Japan have themselves felt the stinging lash of our carriers, with increasing regularity. The fury of these attacks reached a peak last spring, when more than a thousand

carrier-based planes raided Jap war centers and then caught remnants of the Imperial Fleet that were hiding in Japan's Inland Sea. Such successes, however, were not without their price. Only recently, the carrier *Franklin* returned from the wars bombed and blackened, after being damaged severely in the foregoing action. Some 1,100 of her men were lost or injured.

Against a pre-war figure of seven, our carrier fleet has since grown to

a total of 26 combat carriers and 65 escort carriers. It has been built up on several new classes of ships — CVE's, or escort carriers, CVL's, or light (10,000-ton) carriers, and CV's, the 27,000-ton *Essex* class carriers. But the most formidable of all are the new 45,000-ton CVB's, of which the newly launched *Franklin D. Roosevelt* is an example. As long as a 72-story skyscraper, it will be able to carry more than 80 twin-engined planes.

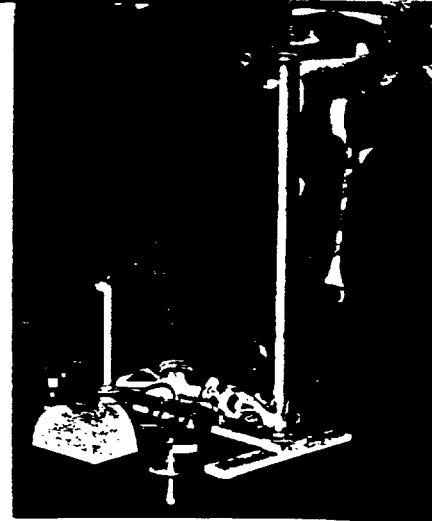
Landing craft such as this storm the beaches after the carrier planes have paved the way

Experienced deck crews give each plane a thorough going-over to "keep 'em flying"



KNOW-HOW

in Handling Fuels



Doug Jeppe, of Ethyl Corp., who talked before ATC groups

Personnel of the armed forces are being taught proper methods of handling gasoline in two fuel operations courses

TO THE ORDINARY civilian, the Air Transport Command represents a branch of the Army Air Forces that does an important and exciting job in the war. But in point of fact, the ATC is far and away the biggest single airline in the world. Last year, for example, it flew a total of 600 million airline miles — a distance equivalent to 24,000 trips around the world.

For an idea of what it does, take the ATC's Ferrying Division, one of the principal operating units.

The Ferrying Division is charged with the delivery of tactical aircraft to all overseas bases. It flies high priority cargo over a vast transcontinental network in this country, and sometimes takes it abroad. Since April, 1944, it has flown some 100,000 wounded men from coastal debarkation points to inland general hospitals. And it is carrying on an extensive program of retraining seasoned pilots to fly different types of ships than they did formerly.

Because its operations are so vast and vital, the Ferrying Division some time ago undertook, in cooperation with Ethyl Corporation, an educational program for its personnel on the proper handling and storage of gasoline. Its purpose was to prevent accidents from gasoline, with partic-

ular reference to the fire and explosive hazards. The program was also designed to remind trained pilots to use gasoline of proper antiknock level in their planes. In view of the huge gallonages consumed, this program has been of great importance to the Ferrying Division.

Two Films Shown

The program has consisted of two informal talks, given at each meeting by Doug Jeppe, an Ethyl safety engineer, and supplemented with two educational films. One of these films is "Fire," especially produced for the purpose by the ATC and Ethyl, which reviews the fire hazards of gasoline and the proper methods for controlling them. The second film is "Power and Octane," produced by the Standard Oil Co. of New Jersey, which describes the power and performance characteristics of gasoline. In his talks, which follow each film, Mr. Jeppe elaborates on the fire and explosive hazards of gasoline, reviews the health hazards as well, and explains the proper methods and safety equipment which should be used at all times.

Colonel Ralph I. Williams, assistant chief of staff to Brig. General Bob E. Nowland, commanding general of the Ferrying Division, has

been in charge of the program for the ATC. Together with Mr. Jeppe, the travelling party has included Captain John Thackston, fuel control officer of the Ferrying Division and Sergeant Ed Weiss. When the program was first started late last year, in charge of it for Ethyl were the late John G. Martin and Philip M. Perry. These men were killed, while out on tour for the ATC, as their plane was taking off from Memphis. Despite the loss of these two valuable men, Ethyl volunteered to carry on the program, and Mr. Jeppe has had charge of it since.

To date, Mr. Jeppe has visited 26 ATC bases in this country and talked before 10,400 men. In addition, special meetings have been held in Newark, Washington, and New York, to acquaint ATC headquarters officers and oil company men with the program. The program has been so successful, in the opinion of the ATC, that it is presently planning to expand it to its bases throughout the world, in cooperation with Ethyl. Four teams of instructors, together with their demonstration equipment, are expected to take part in it. The program is scheduled to begin shortly.

A somewhat similar program, in which Ethyl has been privileged to cooperate, has been given at the

Naval Supply Operational Training Center at the Naval Supply Depot in Bayonne, N. J. Rear Admiral E. D. Stanley is in command of the depot. Commander H. Halpern is Officer in Charge of the Training Center, and Commander Carl F. Faires, Jr. is Executive Officer.

The Navy course is an intensive one of four weeks' duration, and is designed to give instruction in all

phases of fuel operation — storage, transportation and handling — with heavy emphasis on the practical side and on the safety aspects. The students, of which there are 20 to a class, include naval personnel who are to take charge of fuel operations at domestic naval fuel depots and at advance bases. A number of Army personnel are also taking the course. Almost all of the students are for-

mer oil industry employees. Among the subjects taught are the chemistry of fuels; gauging and sampling; pumping systems; pipeline operations; the loading and discharge of tank trucks, tank cars, and tankers; fire fighting methods; storage tank cleaning methods; air field operations, and aircraft carrier fuel systems.

This comprehensive curriculum was planned by two Navy lieutenants — Martin Kantor and H. W. Pattison — and to teach the men, they enlisted the services of technical experts from several prominent oil companies, among others. Among them are Dr. G. P. Koch and Mr. Sidney Smith, of the Shell Oil Co. and Messrs. L. H. Zepfler, G. A. Lloyd, and I. O. Bacastrow, of the Standard Oil Co. of New Jersey. Del Ritchie and William Ball, of Ethyl's New York Division, are also among the instructors, giving talks on the transportation and storage hazards of gasoline, and on the proper methods of cleaning storage tanks.

Besides the classroom lectures at the naval depot, the men are taken on field trips to various oil company installations for on-the-scenes instruction. Among the facilities visited are the Standard Oil refineries at Bayway and Bayonne, the Tidewater refinery and the Texas Co. terminal at Bayonne; the Shell terminal at Sewaren, and the Gulf Oil terminal at Staten Island. Several days are also spent at the Navy Fire Fighting School in Brooklyn and at Floyd Bennett Field.

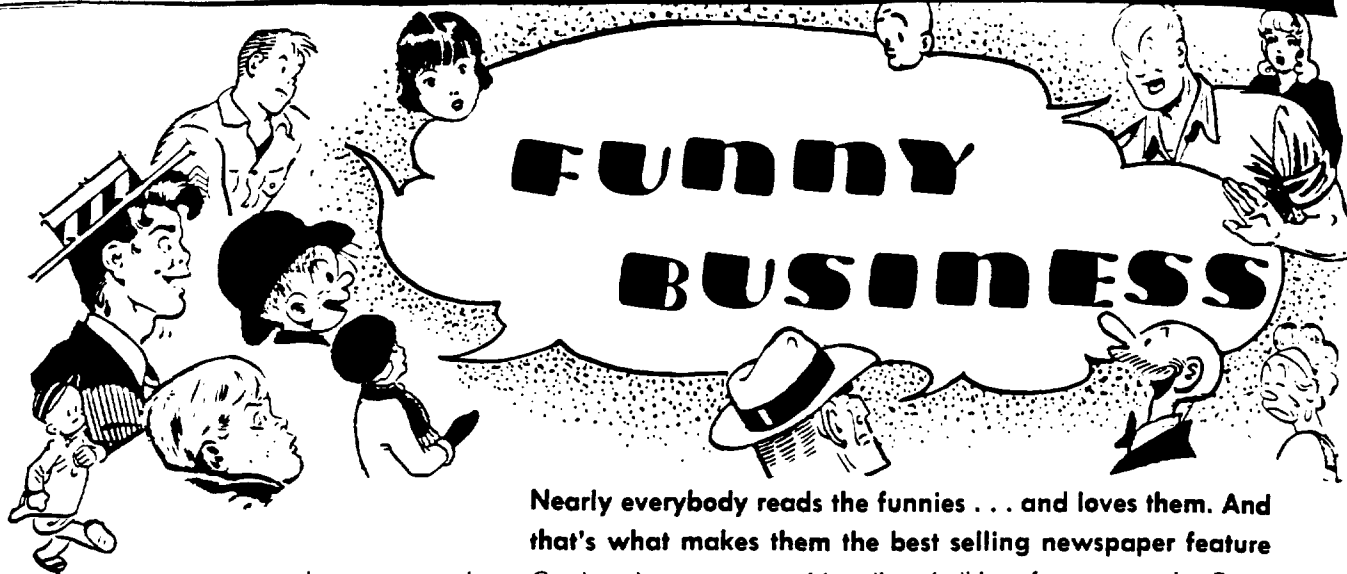
Once again, this course has proved to be of such successful application that a related course is being planned for naval personnel at the Pensacola (Florida) Naval Air Station. This Navy course is another instance of how the oil industry is contributing its technical assistance to help train the armed forces for their job.



At the Naval Supply Depot in Bayonne, N. J., two Ethyl men demonstrate the proper uniform for tank cleaning operations

This audience of oil company men and ATC officers attended a special meeting sponsored by the Ferrying Division and Ethyl





Nearly everybody reads the funnies . . . and loves them. And that's what makes them the best selling newspaper feature

FIFTY YEARS AGO there was no such thing as a comic strip. Today comics are the best sellers of all the features in the daily newspapers. It is a truism in newspaper publishing circles that next to the front-page news itself, it is the comic strips that sell the papers.

The creators of popular comic strips have followings far larger than any author whose book hits the best seller list. A phenomenal best selling novel, such as *A Tree Grows In Brooklyn*, may sell as many as 900,000 copies and be read by four times that many people. A comic strip like *Blondie* is bought every day in the year by approximately 15 million people, and read by more than twice that number.

Some 65 million Americans eagerly read one or more comic strips every day — and follow their favorites' adventures avidly. "Comic strips comprise the most significant body of literature in America today. More Americans read comic strips than perhaps any other form of the printed word," *Life* magazine observed.

Comic strips are even used by oil companies, manufacturing concerns, and commercial establishments as an effective public relations tool. These companies use newspaper comic strip advertising or publish their own comic books.

Some of the artists who draw comic strips receive as much as \$150,000 a year from the newspaper strip alone. And for the syndicates which handle them, the comic strips constitute a leading source of revenue.

The great influence which comic strips now wield in public affairs is aptly illustrated by Joe Palooka, the first comic strip character to put on a uniform. Joe enlisted in 1940, and made Army life look so congenial to his millions of faithful readers that the late President Roosevelt personally thanked Ham Fisher, Joe's creator, for helping put across the Selective Service Act to the American people.

As a symbol of great physical strength, Popeye has made spinach, once the bane of childhood existence, a very palatable dish. In grateful appreciation, spinach growers erected a statue of Popeye in Crystal City, Texas.

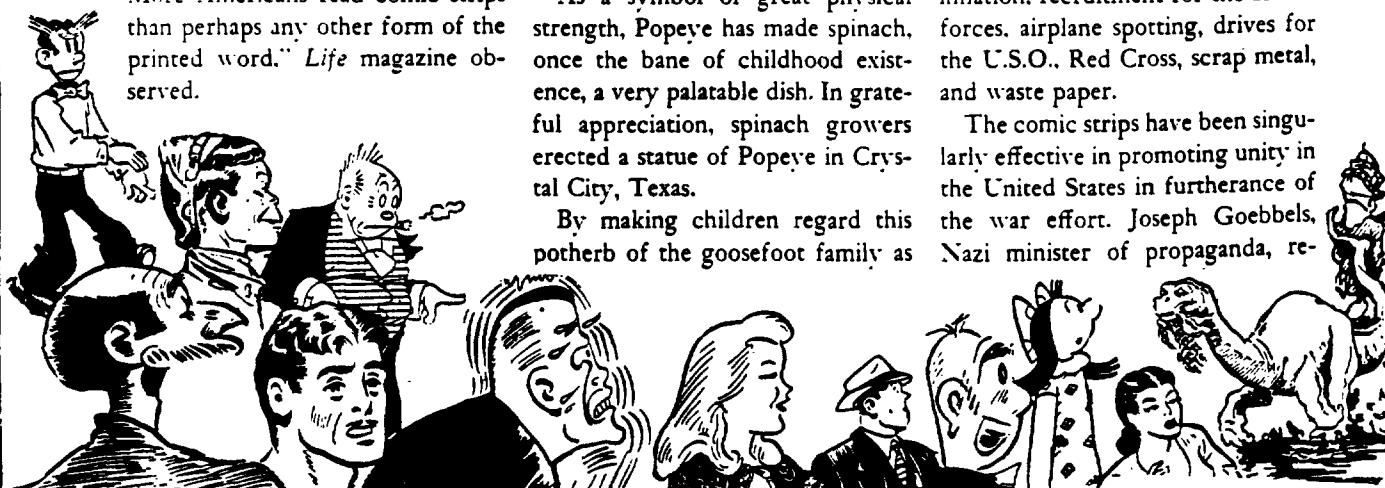
By making children regard this potherb of the goosefoot family as

a builder of strong muscles, Popeye has not only put dollars into the pockets of spinach growers, he also saved wear and tear on the frayed nerves of countless parents who daily endeavored to get a helping of spinach down their offsprings' throats.

The strip, *Terry and the Pirates*, was so well liked by Generalissimo and Madame Chiang Kai-shek that they commended Milton Caniff, the author of the cartoon. They felt that Caniff had done much to help cement friendly relations between the United States and China, because even before Pearl Harbor Caniff had explained China to the United States, and the peril ahead for both countries. Before the war, Caniff was not permitted to identify the Japs as such; they were simply the unnamed "enemy." His millions of readers, however, got the idea.

The comic strips have helped in the sale of war bonds, the fight on inflation, recruitment for the armed forces, airplane spotting, drives for the U.S.O., Red Cross, scrap metal, and waste paper.

The comic strips have been singularly effective in promoting unity in the United States in furtherance of the war effort. Joseph Goebbels, Nazi minister of propaganda, re-



garded Joe Palooka as the "most vicious counter-irritant to Nazi propaganda." And when Superman, in a cartoon crusade, tore the Siegfried Line to shreds back in 1940, Goebbels denounced him as a Jewish creation.

Comic strip editors try to eliminate any portrayal of situations that might have harmful effects on children. Yet occasionally the influence of comics has had some entirely unforeseen results.

One youngster, in attempting to emulate Popeye (who had the fearsome habit of ripping off the tops of spinach cans with his teeth) cut his mouth so severely that he had to have eight stitches taken in it.

Another boy, trying to fly like Superman, jumped off a 30-foot roof. Fortunately he was not killed.

If a person were privileged to

read the mail that comic strip artists receive, he would be amazed at the contents — and the identity — of the writers. Once when Little Orphan Annie's dog Sandy was lost, Harold Gray, Annie's creator, received the following telegram: "Please do all you can to find Sandy. We are all interested. (Signed) Henry Ford." A telephone call to Mr. Ford's office proved that the telegram was genuine.

In the midst of his own bitter political controversy a few months ago, former Secretary of Commerce, Jesse Jones, still found time to inquire after the fortunes of Little Orphan Annie. Annie, it should be explained, was being hounded by Mrs. Bleating-Hart. Said Mr. Jones, in a wire to Harold Gray, "Mrs. Bleating-Hart is too tough. Can't wait much longer."

Shortly thereafter, Mrs. Bleating-Hart got what was coming to her — and Mr. Jones and millions of other fans were satisfied.

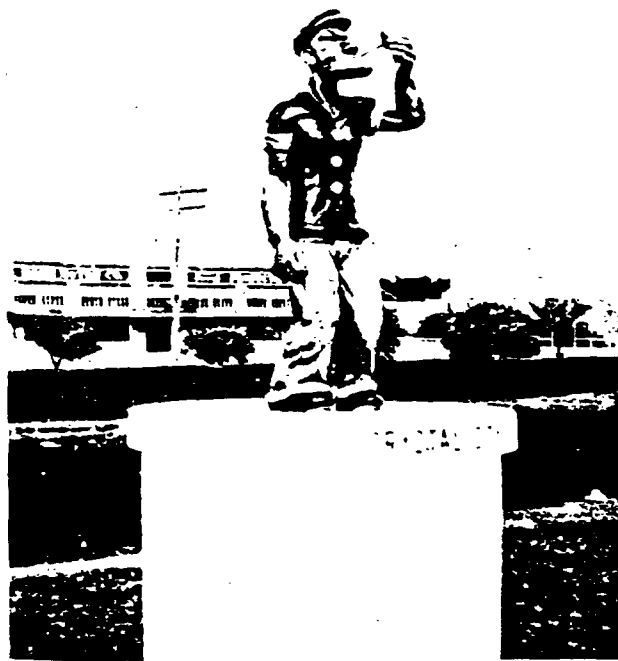
Newsweek took space in its "Periscope" department to predict that Daddy Warbucks, Orphan Annie's patron and protector, who has a chronic habit of disappearing from Annie's life only to reappear again in the nick of time, will never appear again. But Daddy Warbucks is scheduled to "come to life" again on July 29th.

Recently Frank King, creator of *Gasoline Alley*, arranged an accouchement for Skeeze Waller's pun-named and pretty wife, Nina Clock. When the baby arrived, gifts poured in by the score, including a scarce and valuable baby carriage. In addition, hundreds of letters arrived. Some were even from elderly grandmothers offering advice on the best methods of raising children. Some advocated bottle-feeding, while others favored breast-feeding.

One reason for the universal popularity of comics is that they are carefully edited to keep out controversial questions such as politics, religion, and race. In spite of diligent editing, however, a few artists stray into forbidden territory. One of them in particular has been raked by labor leaders for allegedly putting anti-labor sentiments into his characters' speeches.

The comics have become big business, not only in America, but also internationally. American comics are sold in over 100 foreign countries or colonies and translated into 15 different languages, including Tagalog, Icelandic, and Afrikan. They are so popular in South America that Bradley Kelly, assistant general manager of the King Features Syndicate, declares that United States comic

Texas spinach growers were so grateful to Popeye for popularizing their product among children that they erected this statue in Crystal City



ETC 32150

strips are sold sight unseen south of the border.

American comics are loved the world over — yet some have been banned in certain countries for various and often curious reasons.

Mussolini outlawed *Flash Gordon* from Italy because Flash had blond hair. Hitler ordered all American comics barred from Germany and occupied Europe, calling them "a waste of time." Actually he feared the anti-Nazi sentiments voiced by Joe Palooka and Superman, among others. Hitler knew the power of American comics.

In spite of Nazi efforts, however, American humor still went into some countries of occupied Europe to provide not only an escape for millions of Europeans from the brutal realities of war, but also to serve as "one of America's secret weapons during the war."

The exporting of American comics also presents other problems. Titles frequently have to be changed, so that Mickey Mouse in Spanish-speaking lands becomes El Raton Miguelito. In Holland he is called Mikkie Muis, and in France, Le Petit Souris.

Jigg's favorite dish of corned beef and cabbage must be translated to make it palatable for foreign consumption. So it becomes chile con carne south of the border, spaghetti in Italy, rice cakes in China, and tripe and onions in England. Kissing is frowned upon in Japan, so all osculatory gestures had to be deleted from comics going to that country.

The big business of comic strips began in a very small way. The first comic character published regularly every week was the *Yellow Kid*, drawn by R. F. Outcault. This first appeared in the *New York Sunday Journal* in 1896 and was famous for several years.

Other comic artists who came along later were Rudolph Dirks who created *The Katzenjammer Kids*, Fred Opper with *Alphonse and Gaston* and *Happy Hooligan*, George McManus with *Bringing Up Father*, and Bud Fisher with *Mutt and Jeff*.

About 1920, Sidney Smith with *The Gumps* and Frank King with *Gasoline Alley* turned gags to straight story-telling to inaugurate a new era of comics.

In 1931 came *Dick Tracy*. This strip was the first to treat murder, robbery, torture, and plain and fancy mayhem as mundane, everyday occurrences.

Then to round out the types of comics, came the strips of imaginative romance. The heroes of these strips — like Flash Gordon and Brick Bradford — think nothing of dashing off to far distant planets (located millions of light years away) in a few minutes or transporting themselves by some magic device 500 years into the future.

World War II has deeply influenced comics. With the creation of a great armed force, newspapers and magazines have been published by the various branches of the service. Their best-read features, of course, are the comics.

Although the Army newspaper, *The Stars and Stripes*, has long had a comic page, its Mediterranean edition only recently put out its first colored comic section. The printers ran into difficulty from the start since there didn't seem to be any colored ink in all of Italy. After some searching enough was finally found. When it was first used, however, the ink did not dry properly and the newsprint on the presses kept tearing. Generally it takes linseed oil to make a good mixture, but none was available. So the printers used 30-grade motor oil instead, and achieved satisfactory results.

Many young Army artists have been catapulted to fame via such publications as *The Stars and Stripes* and *YANK*. Among them are Sgt. George Baker with his *Sad Sack*, Lt. Dave Breger with his *Pvt. Breger at War*, and Sgt. Bill Mauldin with his cartoons of Joe and Willie entitled *Up Front With Mauldin*.

Sgt. Baker believes one of the reasons for the success of the *Sad Sack* is because of the universal humor it contains. Then too, there is an element of pathos about the poor, downtrodden *Sad Sack* — who always gets the worst end of things. Sgt. Baker believes that nearly everyone has had humiliating experiences which he tries to forget as soon as



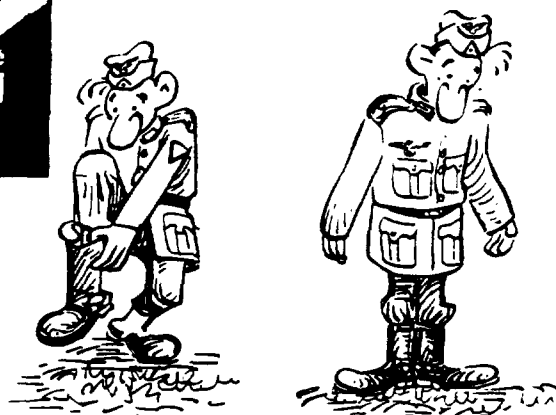
The Sad Sack, created by Sergeant George Baker, is immensely popular with soldiers and civilians alike



possible, although in odd, lonely moments he may take them out of his memory and brood over them. No one ever identifies himself with the Sad Sack. Yet the reader's sympathy is stirred by the plight of the little underdog who is being forever kicked around.

Baker's cartoons, along with those of several other service artists, have been well received. That is why comic syndicate executives read the various publications of the armed forces with an appraising eye. For they know that today's favorite with the soldiers may become tomorrow's Best Seller among the general public — and they have no intention of overlooking a good bet.

"SOUVENIR HUNTER"



© 1944 SGT. GEORGE BAKER



Does the dirigible have a place in postwar air travel? Here's what its proponents have to say

QUEEN of the Skies

By Roger Williamson

WHAT THIS country needs is an eight-million-dollar cigar.

So say proponents of the lighter-than-air ship: the dirigible. They concede, that, after the war, the skies will be filled with planes zooming along at better than 400 miles per hour. But there'll still be room, they say, for a big fat cigar that floats along at a 90-mile-per-hour pace. They see the dirigible not as a direct competitor with the plane, but rather as a supplement to it, and to an ocean liner as well. They pin their hopes for the dirigible on an expected low operating cost and high payload.

Chief among the advocates of the dirigible, postwar, are spokesmen for the Goodyear Aircraft Corp., which has built some 150 blimps for the Navy during the war. The company has such faith in the airship that it has proposed building a super-dirigible, 950 feet long, that would cost \$8 million.

What will this postwar airship be like? Says Mr. H. Webster Crum, of Goodyear Aircraft: "Plans for it already are on the drawing board. It will be a leviathan, a 10,000,000-cubic-foot monster, as large or larger than those seagoing leviathans, the *Queen Mary* or *Normandie*. The biggest previous airship, the *Hindenburg*, was a 7,000,000-cubic-foot



Dirigibles could provide luxurious passenger accommodations, due to the huge size of the craft foreseen

ship; the *Akron* and the *Macon* were 6,000,000-cubic-foot ships, and the world's most successful airship, the *Graf Zeppelin*, was only of 3,800,000 cubic feet. . . . The airship is primarily a long-distance huge-capacity carrier. The postwar super model will have a theoretical range, at cruising speed, of 6,750 statute miles, with a 35% fuel reserve."

Low Operating Cost Seen

The most important argument for the airship, however, as advanced by its proponents, is that it might have a 90-ton cargo capacity on a non-stop flight of 2,500 miles, and a 70-ton lift if flown nonstop for 4,000 miles.

They point out that the operating cost for such flights might be as low as ten cents a ton-mile. The importance of this becomes apparent if one compares the performance of the largest cargo plane which the Navy

Department has been operating with that of the projected dirigible. The plane carries about 21 tons on a flight of 2,500 miles at an all-inclusive operating cost of about 16 cents per ton-mile. Thus, it would take at least 4½ planes of the present Navy type to haul the same amount of cargo.

Speed costs money. The dirigibles, therefore, flying more slowly, should cost less to operate. The planes, however, are already flying, and the dirigible is only on the drawing board.

Mr. Paul W. Litchfield, president of the Goodyear Aircraft Corporation, wrote to the Civil Aeronautics Board last fall and requested that body, in its deliberations of foreign routes, not to overlook the airship



nor to make any commitments that would preclude the use of dirigibles on foreign commerce routes.

Cargo Airlines, Inc., has petitioned the Aeronautics Board to grant certificates of convenience and necessity for the right to operate dirigibles on five various world routes. The company intends to transport cargo and mail (perhaps second class mail and parcel post) but not passengers, in order not to compete with present heavier-than-air planes in commercial operations. Cargo Airlines believes it can make more money by carrying air freight than by carrying passengers. This seems to be the first company organized solely for the purpose of carrying air freight, and it states that this can be done only by utilizing aircraft with such a huge payload and at

profit on a single route as follows:

New York to Rio de Janeiro	
	4,862 miles
carrying	62 tons — payload
	301,444 ton-miles
at	18c per ton-mile
brings in	\$54,260.00 revenue in one flight
and	\$ 6,564.00 revenue for carrying airmail
	\$60,824.00 for each trip
	50 trips per year
makes	\$3,041,200.00 yearly revenue
minus	\$1,507,220.00 yearly operating expenses
	\$1,533,980.00 potential yearly profit

The company estimates that if the Civil Aeronautics Board grants it only three out of the five routes requested, it stands to make a potential yearly gross profit of \$5,160,600. Others will say, however, that this

is a pure gamble, for who knows how much freight will move by air? Will there be 90 tons available for such a ship to fly on every trip? Can the dirigible earn such a profit if she flies out with a full load and returns empty? Also, others may argue that it may take some time to educate the public to utilize such a service. And some heavier-than-air proponents have already stated that they can move freight at rates just as cheap in the years following the war.

It is possible that there is a place for the dirigible for carrying passengers as well as freight. Some people do not mind the slow speed because dirigibles offer the most luxurious form of travel. Seasickness or airsickness aboard an airship is unknown. The huge ship easily rides

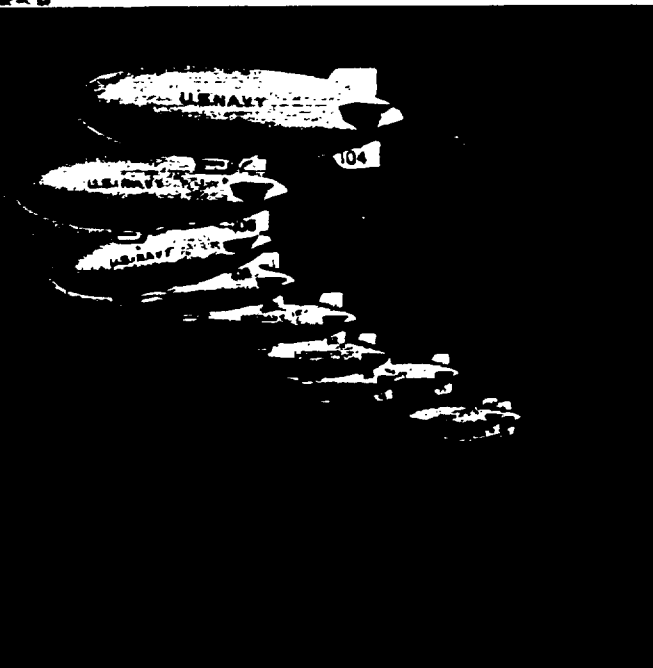


Before the war, the Graf Zeppelin was the most successful airship. Proposed postwar models would dwarf it, however

The Navy blimps have done important wartime service, tracking down subs, escorting convoys, among other tasks

such a low operating cost as the dirigible. It claims, also, that by utilizing airships in such operations it will be able to carry freight at a much lower cost than any other type of aircraft — as low as 18 cents per ton-mile. Present rates for carrying freight average between 80 cents to \$1.30 per ton-mile.

Cargo Airlines figures its potential



the air currents without the buffeting or bumping which is part of an airplane's flight in turbulent air, or the pitching and rolling of a steamer in a rough sea. Measuring 950 feet in length and 142 feet in diameter, she could carry 112 passengers in deluxe magnificence, or 288 tourists in less luxury but at very low rates. Another type with Pullman-like accommodations would carry 232 passengers.

Such a dirigible would need a crew of forty men, from captain down through watch officers, elevator men, radio and radar operators, mechanics and riggers. As a luxury liner, she would need perhaps twenty service personnel—stewards, chefs, and other help.

Says Mr. Crum: "Because its size allows a very large payload, the airship can offer accommodations comparable with those provided on the finest ocean liner and far outstripping the biggest heavier-than-air craft. For example, the comfortable 100-passenger-type ship would offer 100 square feet of 'living space' per passenger; the ordinary heavier-than-air craft offers only twelve to fifteen feet per passenger. De luxe airships would have private staterooms, as roomy and comfortable as those aboard the finest ocean liner. In the tourist type, tourists traveling at very low fares would ride in reclining chairs."

Over long distances, the dirigible has demonstrated that, in spite of its slower rate of speed, the actual time of the trip is not much, if any, slower than the high-speed heavier-than-air ship. As long ago as 1929, the famous *Graf Zeppelin* came all the way from Japan to San Francisco in sixty-eight hours, less than three days flying time, carrying more than 6,000 pounds of payload. Ten years later, the fastest Pan American Airways clipper planes were making their Pa-

cific flights in about 5 days due to the weather encountered and stops for refueling. Therefore, on the longest routes, the dirigible passenger business may prove as enticing as that of the heavier-than-air planes.

No doubt the Navy Department has not used the huge dirigibles during the present war on account of their vulnerability, although they have a large fleet of the so-called "blimps" operating in various parts of the world. They were used successfully in submarine warfare, escorting convoys, and on scouting missions as far south as Trinidad. One news report mentioned a "blimp" at the Straits of Gibraltar when the late President Roosevelt returned from the Yalta conference.

Use as a Hospital Ship

A case has been made for the dirigible as a huge hospital ship. It has been said that, as long as the war against Japan goes on, large dirigibles could be utilized by transporting three hundred litter cases from the war zone every trip. For the seriously wounded, it is argued, no other form of transportation offers so much: no seasickness, airsickness, or vibration; no sudden jarring; a complete hospital unit on board for their perfect care, and for emergency operations. The dirigible would be used as a cargo ship on its outbound trip and converted for transportation of war disabled on the return trip. It would also be used as a plane carrier capable of transporting seven aircraft on a six-day nonstop flight. The greatest authority on lighter-than-air craft in the Navy Department, and, probably, in this country, Rear Admiral C. E. Rosendahl, has this to say: "The fate and future of the airship the entire world over rest unmistakably and unescapably upon the shoulders of the United States of

America. A combination of circumstances and natural factors has saddled Uncle Sam with this responsibility. It is one that he can convert to his everlasting glory. . . . Industry has trained airship engineers and skilled workmen, ready to build the greater ships needed. The blimp program has given us abundant high-type American men trained in at least the essentials of big airship operation. Many of the naval airship facilities along our continental coast lines could be utilized by commercial airships."

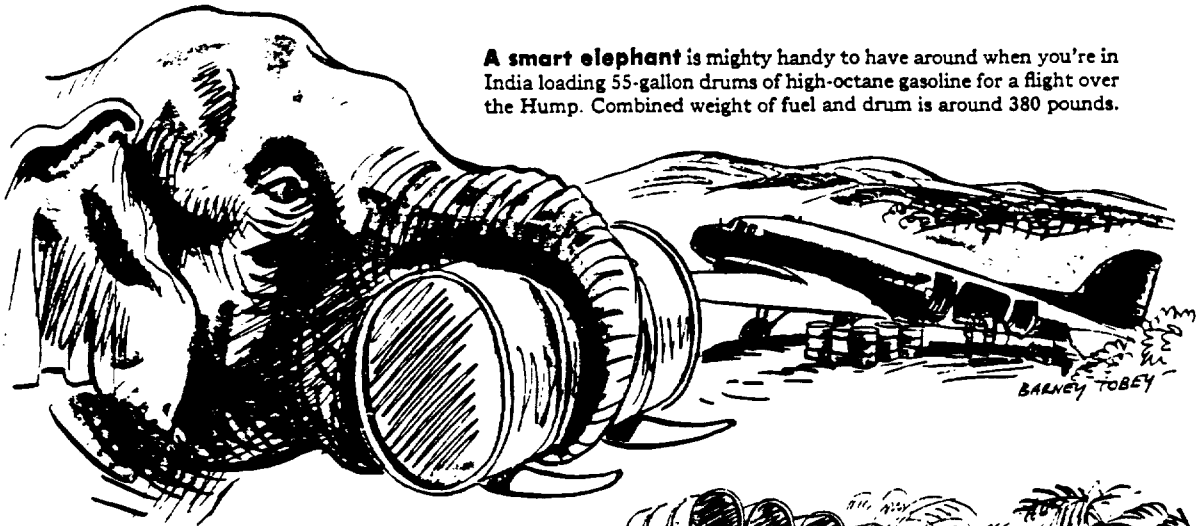
"It would be a 'Milquetoast' approach," he states, "to build only one or two large airships. . . . This country goes in on no such shoe-string basis anywhere else. We need at least a dozen airships of 10,000,000-cubic-foot capacity, each half again the size of the *Hindenburg*. We know we can build them—much improved over anything the world has yet seen. We know, too, that we can operate them. The only nation which tried commercial airships made a real success of them. Is there anyone today who thinks we cannot outdo the Germans in any endeavor for which we have the resolve?"

OUR PICTURES

Cover by Geraldine Linder; Pages 6-8, cartoons by Rodlow Willard; Page 9, Press Association; Page 11, courtesy World Petroleum; Pages 12-13, Official U. S. Navy photographs; Page 17, courtesy King Features Syndicate; Page 19, photo and strip courtesy YANK; Pages 20-22, all photos courtesy Goodyear Aircraft Corp. except Page 21 (left), Acme Newspictures, Inc.

The Best Gasoline is still fighting!

Rough impressions of gasoline's role
on the battle-fronts - based on actual
incidents and official photos.



A smart elephant is mighty handy to have around when you're in India loading 55-gallon drums of high-octane gasoline for a flight over the Hump. Combined weight of fuel and drum is around 380 pounds.

Seabee Ingenuity turned nine empty gasoline drums into this luxurious shower somewhere in the Pacific. Other containers have wound up as ovens, stoves, sinks, washing machines, bathtubs, refrigerators and flower pots. With thousands of drums of high-octane gasoline going overseas every day, our men have plenty of "empties" to work with.



"Muddy, buddy?" But it can't stop a command car for long. The G.I. driver slips a cable around a palm tree, turns on a self-powered winch and lets the car pull itself free. Jungle driving is tough on gasoline supplies, but American and Allied fighters are getting all they need.



Ethyl

CORPORATION

Chrysler Building
New York 17, N. Y.

Ethyl is a trade mark name

EVERY B-29 that takes off for Tokyo is fueled-up with enough gasoline to run a good-sized bus over 30,000 miles. What's more, this is the best gasoline American refiners can produce, improved with Ethyl fluid.

That's why bus operators, while carrying the greatest traffic in history, must get along with gasoline of lower quality. How much longer they'll have to operate with gasoline of wartime quality depends entirely on military requirements—but with final Victory we can all look forward to better gasoline than ever before.

The best men...



the best women...



the best gasoline...



are still needed overseas

America can't take a chance with anything but the best.

Our armed forces have been recruited from the pick of American men and women—the young, the physically fit, the alert and intelligent. Nor has there been any compromise with quality in the equipment and material needed for war.

That's why the fighting gasoline delivered to our Army and Navy represents the best of the American petroleum industry's production, plus most of the Ethyl fluid being manufactured.

Not until the armed services say it is safe to cut back on military production can you expect unlimited quantities of high-quality gasoline. Only then can we promise you all the Ethyl gasoline you want—an Ethyl that will bring out the best performance of any car.

Look for the
ETHYL trade mark



Ethyl Corporation
Chrysler Bldg., N.Y.C.

ETHYL NEWS



SEPTEMBER ★ 1945

ETC 32158



IN THE

ETHYL NEWS

SEPTEMBER, 1945

Lt. Col. William H. Hubner returns to Ethyl Corporation after three years of service with the U. S. Army Air Forces in the Southwest Pacific theatre.

Colonel Hubner entered the Army as a Major in the Air Corps on March 19, 1942, and was immediately assigned to Melbourne, Australia as Petroleum Officer for the Army Air Services in the Southwest Pacific. While working in the jungles of New Guinea, he contracted malaria and was hospitalized in Brisbane.

Returning to active duty, Major Hubner became Special Projects Officer for the Fifth Air Force Service Command. In this capacity he handled technical petroleum problems and represented the Air Force on a number of Service committees which developed methods of preventing corrosion and protecting aircraft equipment from deterioration in the tropical climates.

In March 1944, Major Hubner was promoted to the rank of Lieutenant Colonel. He was subsequently named Deputy Chief of Maintenance and Engineering for the Far East Air Service Command.

In civilian life Colonel Hubner has had a long career in the oil and automotive fields. He was a special test engineer for Chevrolet from 1923 to 1924, was appointed a Fellow on the Petroleum Fellowship at the Mellon Institute of Industrial Research for a period of a year, and was associated with the Universal Oil Products Co., as Chief of its automotive and aircraft department, until 1939. In that year, he came to Ethyl, where he has served in the Technical Service Department in Detroit.

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

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

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

Earle W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzalez, secretary

ETC 32159



Highways

This projected 8-lane expressway will speed traffic, cut congestion in Chicago

THAT HAD TO WAIT

By Pyke Johnson

President, Automotive Safety Foundation

The war has taken its toll of highways as well as cars — but here's what is planned to make driving better and safer

PUBLIC highways and city streets of America have become war casualties. The motorist who has done any driving at all during these war years knows that highway and street construction has virtually stopped except for roads built primarily to serve war plants and military establishments.

But for the motorist of tomorrow there is hope around the corner. There is much to be done, of course, to get back to those gay days of 1941. Two or three years at least must go by before the millions of

cars now running on borrowed time can be replaced. Thousands and thousands of miles of roads and streets must be constructed or reconditioned to obtain the desired measure of safe, smooth travel. However, there are plans afoot and the highway experts have not been idle in plotting the future.

While the war was on, studies were made in order to set a pattern for the future highways and streets of the nation. In many cases the United States Public Roads Administration, state highway departments,

and cities have been cooperating in studies of the origin and destination of urban traffic.

Only by finding out where traffic comes from and where it wants to go can engineers plan for improvements best suited to its own needs.

Undoubtedly, automobile production and highway construction will gain momentum rapidly soon after order has returned to the war-torn world. Probably within a year, automobile production will approach that of pre-war years. And,

it is estimated, a year's time will enable highway officials and road builders to get under way at near top speed.

The first job, of course, will be to reconstruct roads and streets worn out before and during the war. Plans for the work are largely ready, and sizable programs can proceed without delay. Steady progress from the outset, however, will be made by highway departments in designing and building projects of a more intricate or difficult nature.

While road needs have been piling up during the war, so have highway funds. Nearly all states and most local communities have conserved revenues from motor taxes and other sources, and otherwise placed themselves in good fiscal condition for the day when peacetime work could go ahead without any war restraints.

One of the most pressing highway jobs is that of catching up on reconstruction and maintenance. Material and manpower shortages hastened the deterioration of thousands upon thousands of miles of roads and streets of all classes. Arteries which otherwise would have given several more years of service must be rebuilt. On top of the need for maintenance is that of new construction which was also held up during the war. Consequently, to make a gain on accumulated post-war needs, the nation's highway officials and road builders face a larger and more pressing job than ever before.

Because of its many forward-looking provisions, a chief instrument in the postwar highway program is the Federal Aid Highway Act of 1944, which authorities believe will guide highway construction far into the future. It recognizes the necessity of applying facts obtained through engineering and economic surveys.

The facts obtained from the surveys will point the way for a soundly financed and planned program, not for one year but for many years ahead. The federal funds made available by the legislation provide the energizing force for highway construction. But state and local governments must match the federal funds — and they must adhere to engineering and planning standards which have emerged from the last 25 years of highway construction.

A total of 500 million dollars a year is provided in federal funds, on a 50-50 matching basis, for each of the first three postwar years. These funds are apportioned among all the states by a fixed formula. The federal contribution is divided to cover the three most important networks of roads — 225 million dollars per year to the regular federal aid highway system (main rural roads and selected principal streets); 150 million to secondary and farm-to-market roads; 125 million to urban projects on the federal aid system.

\$1 Billion a Year

With the states matching that money, this means an annual federal-state program of one billion dollars. The prospects are that much more than that sum will be spent on roads and streets, as was the case before the war.

Highway costs in total reach large figures because of the vast mileage of highways and the intensive usage of them. While federal funds are made available to only a small portion of the nation's arteries, the influence of the federal highway act should have a marked effect on all road building in the advancement of sound planning and the holding of costs to a level both reasonable and in keeping with actual needs.

Contained in the federal highway

act is a provision which ranks as one of the outstanding mileposts of highway history — the creation of an interstate or interregional system of highways which in its 40,000 mile length will connect practically all major cities, all states, and, of course, all regions. Military as well as social and economic considerations led to the establishment of this new network. A striking fact is that, although it contains only about one per cent of all roads, the interstate system will carry 20 per cent of all motor travel.

At one time there was much speculation as to whether separate highways should be constructed for bus and truck traffic.

Truck traffic was so heavy on some inter-city roads that trucks were excluded on Sundays and holidays when vacation travel was at its peak. Usually those highways were only two lanes wide, and even with commercial vehicles banned they were still congested and far from safe. That was before the nine-foot-wide traffic lane gave way to the ten-foot or wider lane, and before the ordinary wide road had evolved into the modern express highway, with its central dividing strip and non-stop features. At that time, buses and trucks lacked the speed and efficiency which later enabled them to keep up with the passenger car.

Today, the need for separate arteries for the large vehicles has all but disappeared, although in some communities concentrated truck flows near consolidated terminals may require special truck highways of short lengths. The solution in most cases is to provide more traffic lanes, and to modernize important roads and streets so that all traffic may move freely and safely.

Highways can be built to serve both passenger cars and larger vehicles with relatively little extra con-

struction cost, and of course, at a cost far less than for building two roads, one for passenger cars and one for trucks. In some recreational or residential neighborhoods, parkways may be constructed in coming years which will exclude commercial traffic. As before the war, such highways will be few. Practically all express highways for which designs have been completed or are under way will carry all types of traffic.

Adequate roads and streets to ac-

commodate all traffic, however, solve only one of the bus and truck problems. Adequate terminal facilities are needed, both to facilitate loading and unloading and to enable all traffic to move freely. Today, valuable street space is being used for makeshift terminal facilities. Many of the specially constructed bus or truck terminal facilities have been located on a hit-or-miss basis, are of a limited capacity, and were established largely to serve the needs of one firm. Consequently, many cities

are dotted with small terminals that form a pattern often detrimental to city health and growth.

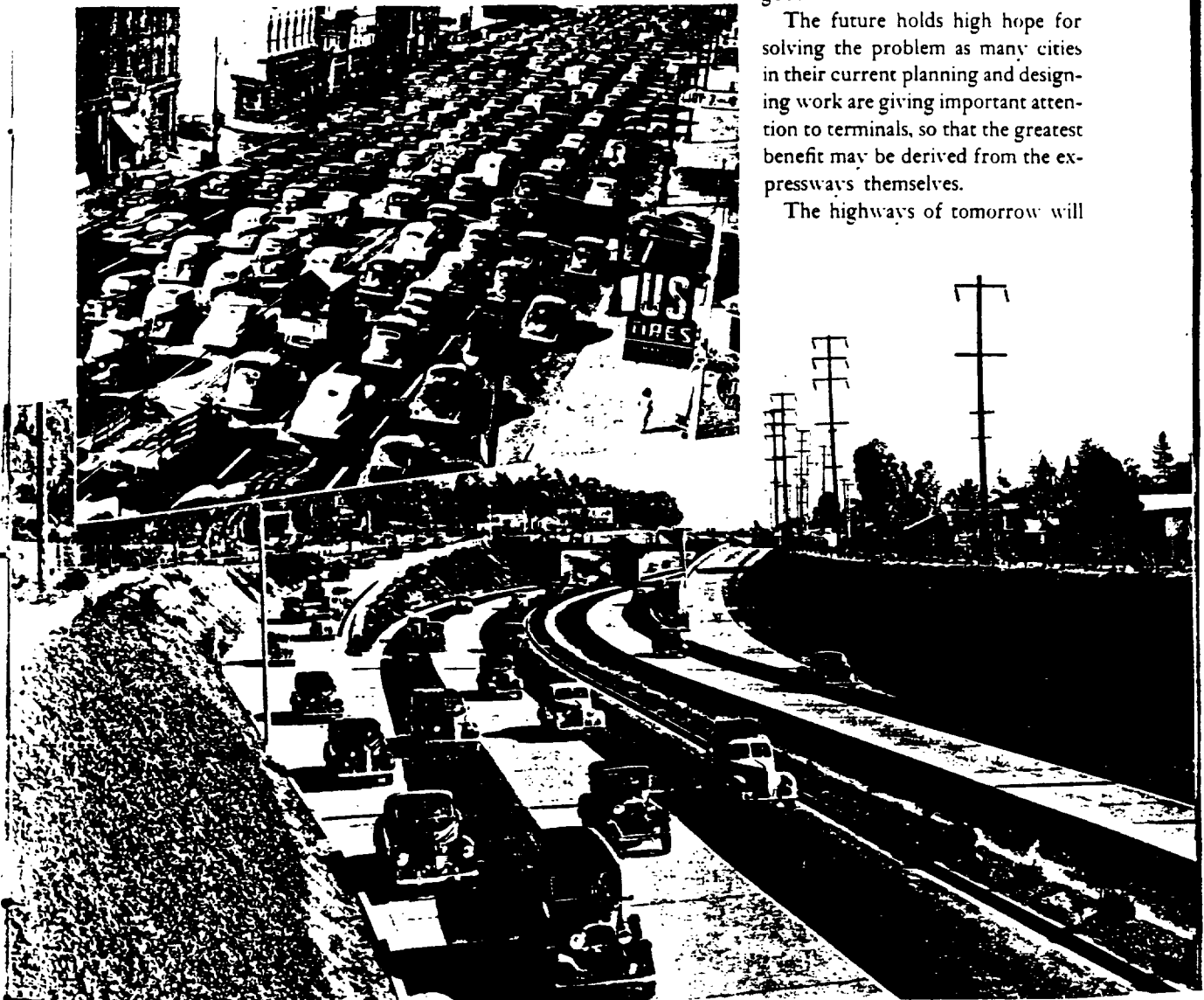
The traffic origin and destination studies which are being conducted by many cities reveal the travel habits not only of passenger cars, but also of trucks and buses.

Whether terminals are to be constructed by government or by a private group or firm, the O-D studies, as they are called, will provide basic information for their location and size. Probably many cities, with recourse to the facts, will stipulate in zoning regulations where passenger car, truck, and bus terminals each should be located for the common good.

The future holds high hope for solving the problem as many cities in their current planning and designing work are giving important attention to terminals, so that the greatest benefit may be derived from the expressways themselves.

The highways of tomorrow will

This scene of Woodward Avenue, in Detroit, gives an idea of vehicle traffic as it was before the war. Bottom, the Arroyo-Seco Parkway in Los Angeles provides for comfortable driving and saves time



be built to high standards, not only from the standpoint of engineering design for long and economical service, but for the utmost *built-in driving safety*. It is expected, because of the inadequacy of arteries in metropolitan areas, that emphasis at the outset of postwar road construction will be placed on express highways into and through cities, and on belt highways.

Express Highways

The express highways will be of limited access design, and largely in and near populous communities. Such highways will have no traffic lights to slow travel. Not only will these highways be designed to reduce substantially accidents and congestion, but will also carry two to four times more cars per traffic lane than the ordinary wide city street. Access to them will be permitted only at well-designed points to prevent unsightly, dangerous encroachments along road sides. Progress will also be made in constructing express highway belts around downtown areas and around cities. In addition to distributing traffic intelligently, belt express highways aid in stimulating proper land usage.

Provision of adequate urban traffic facilities in itself is an enormous undertaking. In the past, relatively few projects have been undertaken to rid cities of costly congestion and unsafe travel on their main arteries. Enough projects have been constructed, however, to point the way to future work. In addition, the emphasis on sound engineering and

planning will produce facilities which will aim at the future as well as at the present.

The future promises to make urban motor travel easier and speedier. The best way to get an idea of the urban highways that lie ahead is to look at some of the projects which have been scheduled for early postwar construction.

Certainly Los Angeles motorists can look forward to more pleasant driving. Seventy miles of express highways are in prospect for Los Angeles County. Of the mileage, ten are ready for immediate postwar construction. Express highway construction will proceed on the Harbor-Arroyo-Seco route and on the Hollywood-Santa Ana route, both of which will have special stopping lanes for buses. Where those two routes intersect, something new in highway annals will be built—a four level grade separation. Geographic conditions and an extremely heavy traffic flow (525,000 cars daily, even now) combine to require such a remarkable structure.

Those who have had to travel on Chicago's ground level streets in the past will find welcome relief when they drive on the projected eight-lane expressway on Congress Street. The eight-mile Congress Street Expressway, running west from the lake front highways to the eastern boundary, is estimated to benefit 37 square miles of the city. A section of the highway will be elevated, but most of it will be depressed below grade. The Expressway will provide rapid, safe travel and it will restore present crowded, narrow streets to their rightful functions of handling local traffic.

New York City, too, is planning to build express highways which will make the motor vehicle far more useful in that crowded area. One of the many projects is completion of

the East River Drive and the West Side Highway to provide non-stop travel completely around Manhattan Island. Another project is completion of the traffic tunnel under the East River to connect with an express highway leading through Brooklyn to other express highways on Long Island.

Plans for Detroit

In Detroit a long-range program of express highway construction has been set up, with the state, city, and county cooperating. Sections of the Crosstown and of the John C. Lodge express highways are scheduled to be built soon. The Crosstown Highway will connect with the new Detroit Industrial Express Highway to the west. The John C. Lodge Highway will greatly relieve congestion on routes to the north.

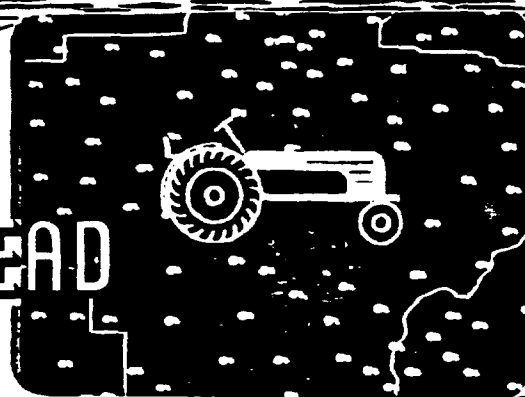
Many other cities have made or are making definite plans to build express highways. Some of them are Dallas, Houston, and Beaumont, Texas; Portland, Oregon; Baltimore, Cleveland, San Francisco, Atlanta, Denver, and Toledo.

For the mythical "average driver," his mileage during the war was reduced by about a third. Now that the "lid is off"—and he can buy gasoline freely again—he'll doubtless jump his auto travel mileage manifold. And as ample supplies of tires become available, traffic gradually will begin to assume the proportions of those pre-war days when as much as 334 billion miles of travel in a year were driven by the then 34 million motor vehicles.

It's going to take time for highway engineers and builders to catch up with the proved needs of motorists. Yet never before in the entire history of automotive transportation have prospects appeared brighter for achieving the kind of highways that are needed.



THE JOB AHEAD



New movie highlights the important part that farm equipment retailers will play in the future of American agriculture

FARM equipment dealers have a key role to play in the broad transition of American agriculture from war to peace.

As farmers turn from their war-time job to the equally big task that lies ahead, they are in need of thousands of new and improved power implements; their old machinery that is still useful must be overhauled and put in shape; the soil needs to be replenished and restored to full productivity; the problem of soil erosion calls for extensive work; farming as a way of life must be made attractive to millions of returning servicemen and those who migrated to war plants; farming as a livelihood must be made more profitable and comfortable in the years that lie ahead.

In all of this, the nation's farm equipment dealers can and will play an important part. More than most people realize, their plans and actions will greatly influence the future of American farming. Initially, their job is to help farmers to rehabilitate their farms and their equipment for tomorrow's food and fiber needs.

Over the long term, their job takes in much wider vistas.

This underlies the theme of a new movie which has been produced by Ethyl Corporation in cooperation with the National Retail Farm Equipment Association and its affiliated associations. Entitled "The Job Ahead," the film reveals what progressive farm equipment retailers are doing to prepare for the post-war future. More than that, the picture illustrates how dealers can be of more effective service than ever before in handling and anticipating the needs of farmers.

Back on the Job

Like every other line of business, farm equipment dealers have thousands of former employees serving in the armed forces. Accordingly, the picture is built around a typical employee, now a returned veteran, who has come back to his old job.

When Bill Adams, the veteran, reports to his boss on the first day back, he has naturally brought with him many new ideas about the business. For one thing, his Army life

has taught him a new appreciation of power tools and their application. But it surprises Bill to learn that his boss, Tom Wilson, has not been idle in thinking about and planning for the future. The war may have sharply curtailed his sales of farm machinery. Nevertheless, there has been much progress in his business.

Bill is amazed to learn that his old firm now does a year-round business in sales and service both. To anyone like Bill who has experienced the peaks and valleys of farm equipment retailing before the war, this comes as a vast improvement; no longer need there be those lean periods in which a company is almost completely idle — nor those rush seasons in which it has more business than it can handle.

One of the reasons for this is that the "Wilson Farm Machinery & Implement Sales Co." has for the first time a complete, up-to-date survey of its marketing area.

This began by securing an aerial photograph of its marketing area, obtained from the Agricultural Ad-



The movie centers around a veteran back on his old job . . .



. . . who finds that much progress has been made in recent years



justment Administration through the local county agent. This map helped Tom Wilson to visualize his marketing territory, outline its reaches, and break it down into individual customers and prospects.

As a second step, every farmer in the territory was interviewed, and the results noted on two survey forms which were prepared by the NRFEA. The first form gave a description of the machinery and equipment owned by every farmer. The second form listed those farmers who are prospects for specific pieces of farm equipment — and when. Together those forms developed invaluable marketing data. Now for the first time Tom Wilson had a complete record of his customers and their sales potentialities.

As a corollary to this, one of the mechanics in the service department devised a seasonal service record. This consists of a chart marked off by months. Simply by listing the various machines a farmer owns — and noting the respective months they are busy and idle — a customer can be advised when to have a given piece of machinery repaired or serviced, without interfering with his work. At the same time, this helps the service shop to schedule its anticipated service work.

Meanwhile, the equipment dealer's service department has been expanded to handle a larger volume of service business. Precision machinery has been installed, specialized tools have been added, the parts department better arranged — all for the purpose of doing a better service job for the customers. Now, Tom Wilson's service department is equipped to handle any kind of repair job — and do it faster and better than ever before.

Still another step forward in Tom Wilson's way of doing business has been the introduction of a "Profit

Control Record." That system, conceived by the NRFEA and distributed among its members, is designed to help him look ahead in his business, by having him estimate, month by month, his future sales of various items. Then, by comparing the actual record each month against the previous estimates, Wilson can tell whether he's behind or ahead of schedule. It also enables him to know what department in his business is not contributing its share of profits.

These are only some of the improved methods of doing business which progressive farm equipment dealers, represented by Tom Wilson, are putting into practice. Others include the addition of new merchandising lines, creation of a "courtesy room" for the relaxation of farmers' families, and so on.

Here, then, are some of the ways in which forward-looking farm equipment dealers are preparing for the future. A recent survey of the NRFEA's membership reveals it has jobs for more than 50,000 people. But that isn't the final goal of the equipment dealers. Their final goal is to enter upon a new era of heightened usefulness to the farmer, helping him with power machinery to obtain the maximum production from his farm, helping him with power machinery to replenish the good earth.

The movie, which will be shown beginning this month, will be presented before virtually every tractor dealer in the United States and before many dealers in Canada. It is the second in a series of films especially prepared for farm equipment dealers. The first film, "The Road Ahead," which was produced last year, was shown before the NRFEA and its affiliated associations and other members of the farm equipment industry, for a total of 18,000 people.



Marketing surveys have been made, the service shop expanded . . .



. . . these and other steps foreshadow a new era of better service





Playing cards is an age-old pastime that never loses its warm popularity

Deal Me

By North Clarey, Jr.

forces, 10 million packs for the Red Cross. The greatest shortage of cards anywhere is in military hospitals, where they do more than just help kill time. They help men with smashed hands or paralyzed arms regain their use and their confidence.

Although the three most widely known games in this country are rummy, solitaire and contract, the service favorites are poker, cribbage and black-jack, or "21." Three out of four servicemen play; before they enlisted only about half of them did. Poker is unquestionably the most widely argued-about game. It's so full of variations, that with men thrown together from every different state the matter of establishing local ground rules often winds up in hot dispute.

Civilians have the same disputes. Nearly a thousand letters a year asking for a ruling on poker problems are addressed to playing card manufacturers or societies — on Red Cross stationery, ladies' personal note-paper, V-mail or business letterheads. They are all forwarded to the New York headquarters of the Association of American Playing Card Manufacturers, and all are answered.

A Pfc. with an APO address from the Pacific wants to know whether a pair of wild deuces can be shown

IN WAR as in peace, Americans love to play cards. Rich man, poor man, beggar man, thief — all thrill to the pastime of card games. Many play cards for the companionship to be found, others for the element of chance involved, still others to relieve boredom or tension. Yet, whatever the reason, card playing is a perennial pastime among its millions of devotees.

During the war, a lonely Marine penned up in an island fox-hole would fish a damp deck out of his pocket and pass the long hours of waiting in solitaire. Sailors and

troops, sweating it out in a darkened ship waiting for the pre-dawn invasion signal, played black-jack and poker in little groups under the red blackout lamps. General Eisenhower, sitting out the last tense hours before the Normandy invasion, played contract bridge with Commander Harry Butcher, his naval aide, General Mark Clark, and his chief of staff, Major-General Gruenther — a world-known authority on duplicate contract bridge.

This year, with cards on the "scarce items" list, 23 million packs have been reserved for the armed

as openers in a jackpot hand. (They can.) The secretary of an electrical workers union in Michigan wants to know, also in a wild deuce game,

In?

whether an A-2-Q-2-6 flush beats an A-K-Q-J-5 flush. (Yes — the 6 beats the 5.) Number 79608, in a midwest prison, writes on the censored penitentiary letterhead to ask whether a straight is permitted in stud poker. (It is.) Even the radio "Answer Man" has inquired, for a listener, whether a flush in one suit would beat an equivalent flush in another suit. (It doesn't; the two hands split the pot.) Every one wants to play "according to Hoyle." Many of the letters even begin: "Dear Mr. Hoyle —"

Hoyle is still a fixed authority on card games, but it's not a man, it's a book — Foster's "Complete Hoyle Up-to-Date." Edmond Hoyle himself never heard of poker. He died in 1769. An ex-lawyer, he grew wealthy teaching the English gentlemen of his time how to win at whist — and from his original treatise on that one game has grown the card "bible" of today.

Out of whist has grown bridge. It is our third most widely known game. According to a recent survey by the card manufacturers' association, 44% of the people in this country know how to play contract, and auction is in fifth place. In order, the best-known games are rummy (49%), solitaire (45%), contract (44%), poker (37%),

auction (34%), pinochle (33%), hearts (30%), and five hundred (22%). There are 77 different games played in this country, including such rarities as datta, pedro, fan tan, biskola, snap and everlasting. Cards are found in 87% of American homes. They are played more than all other games put together.

Odd things turn up if you examine this survey according to income groups. Contract is highly popular in the highest income brackets, falling off sharply as you go down the scale — yet pinochle runs exactly the opposite. With all men's groups, regardless of income, poker remains second favorite; the greatest variation occurs among women. Auction bridge still retains its greatest popularity among the poorest group, and in our most traditionally conservative section — New England.

To meet American demands, play-

A comic German playing card, popular around 1850 to 1860



ing card manufacturers have to make four standard decks: the usual pack of 52 cards; a pinochle set of 48; a six-handed "five hundred" deck of 62; and a 64-card pack for

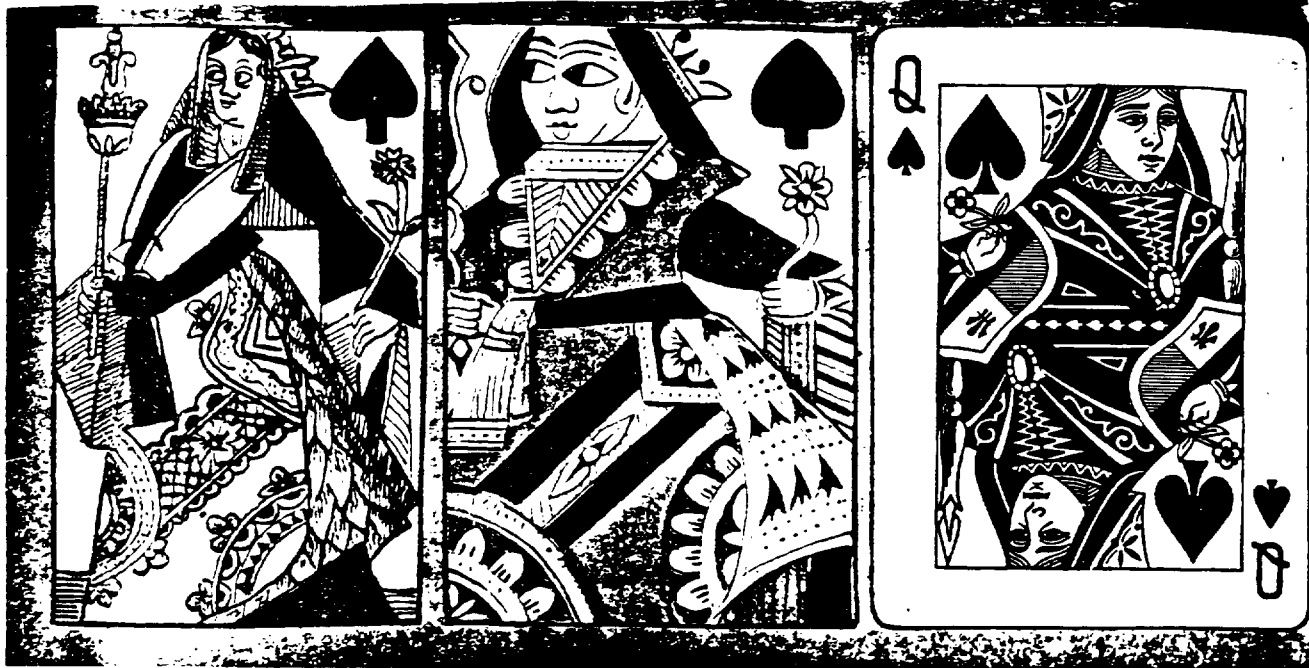
"double skat," a Scandinavian game widely played around Milwaukee.

Once an experimental deck was printed with a fifth suit, "Eagles," for large poker games. It flopped, as have nearly all novelty decks of cards. During the Civil War, a pack of cards showing Confederate heroes was widely popular in the South (it was printed in New York and smuggled across the border). Recently a "spotter" deck showing planes of the American, British, German and Japanese air forces became a success — more than two million sets have been sold, many to the Army and Navy. By and large, however, the public won't let a manufacturer fool around with new ideas. It is almost axiomatic that the "forward-looking" card printer is going to go out of business.

Hundreds of people write the manufacturers each year suggesting that national heroes replace the king, queen and jack pictures, or offering as an original idea the notion of changing the suit colors, selling advertising space on the backs, or tinting the blank spaces on the face with a restful shade. But the card-making companies have learned through bitter experience that they cannot alter a whisker of the king's beard without stirring up a cyclone of protest. Men who bet wildly on the turn of a single card are inflexible conservatives about the looks of that card itself.

Napoleon once commissioned famous artists to revise the deck, but his devoted subjects merely gave his brainchild a good old Gallic raspberry. Even in Russia during the Revolution, when the Soviets tried to replace the "anachronistic kings and queens," so many foreign decks were smuggled into the country that the Kremlin simply gave it up.

It wasn't always thus. Before the



The Queen of Spades, only queen to hold a sceptre, has vastly changed through the ages. Here are 16th century French, 18th century British, and 20th century American versions

printing press. cards were hand-painted affairs, mostly done by famous artists or nobles. One gold-encrusted set might cost \$5,000. Some of these fabulous pasteboards are still preserved in private collections such as the Morgan Library in New York or the Cincinnati Museum.

Our modern deck stems from the 15th century Italian *Tarot* or *Tarocchi* pack, which had 22 face cards and 56 numeral cards. This, in turn, was based on an Egyptian set, and that one had its origin somewhere in the East too far back to be established. The most likely guess is that cards developed sometime before 800 A. D. in Hindustan, though some say they originated in China as part of the claptrap and gadgetry of itinerant magicians.

Occasionally you'll still see a Tarocchi deck — that is if you're the kind that hangs around tea shoppes or crystal ball emporiums. Some gypsies still use them in telling fortunes. Each of the face cards (*Il Bagatell*, the Muscian; *Gli Amorti*, the Lovers, and so on) still means



This Persian playing card used daggers for symbols

the same as it did in the time of the Sforzas. Perhaps the most charming of all is *L'Appeso*, signifying charity, courage, knowledge and prudence, wisdom and fidelity. The card, by the way, shows a handcuffed man hanging by one foot (remember that photo of Mussolini?). *L'Appeso*, in Italian, means "the hanged man."

As you might expect of any institution which has developed over centuries, our modern deck of cards

is full of mysticism, symbolism, and pat little significances. We have four suits, for instance — corresponding



A Knave of Spades from a French Revolutionary deck

to the four seasons. They are divided in two colors, corresponding to the two equinoxes of the year. There are twelve court cards for the twelve months; thirteen cards in

each suit, for the thirteen lunar months of a year; and 52 cards in all, one for each week. Add up the number of letters in "one, two, three . . . jack, queen, king"; they come to 52. Take the face value of all cards, and add one for the joker; you get 365 — one year's quota of days. The joker, by the way, has been the only innovation in centuries.

Even the pictures, now stylized and tamed from the early, crude, fierce representations, come from famous figures. The king of spades is from an early cut of David, king of the Jews. The king of hearts is Charlemagne, of the Franks; Julius Caesar is monarch of the diamonds, and Alexander the Great graces the club suit. Jacks (formerly called knaves) are, by the way, a consolidation of two earlier cards — the prince and the valet.

L'Appeso, the hanged man, in the Italian Tarocchi deck



Even the four suits are descended from symbols of Middle Age feudal society: spades (swords) for the Nobility; hearts (cups) for the Clergy; diamonds (coins — if you can figure it) for Tradesmen; and clubs (staves) for the Peasantry.

Traditional names and superstitions still cling to individual cards. The nine of diamonds has been the "Curse of Scotland" since 1746, when the Duke of Cumberland wrote an order on the back of that card commanding his soldiers to have no mercy for the Scottish troops captured at the battle of Calloden. The six of hearts has stood for "loyalty and honesty" since 1688, when Colonel Richard Grace used it to refuse, in hopeless circum-

These long thin Chinese cards were used in 1862



stances, to surrender to William of Orange with this penned reply: "Tell your master I despise his offer, and that honour and conscience are dearer to a gentlemen than all the wealth and titles a prince can bestow."

The first paper money ever issued on this continent was in the form of playing cards cut in quarters and signed, in 1685, by Jacques de Meulles, French governor of Quebec, who ran out of coin with which

to pay his troops. In the Cincinnati Museum is a king of hearts inscribed on the back to admit the bearer to courses at the University of Pennsylvania.

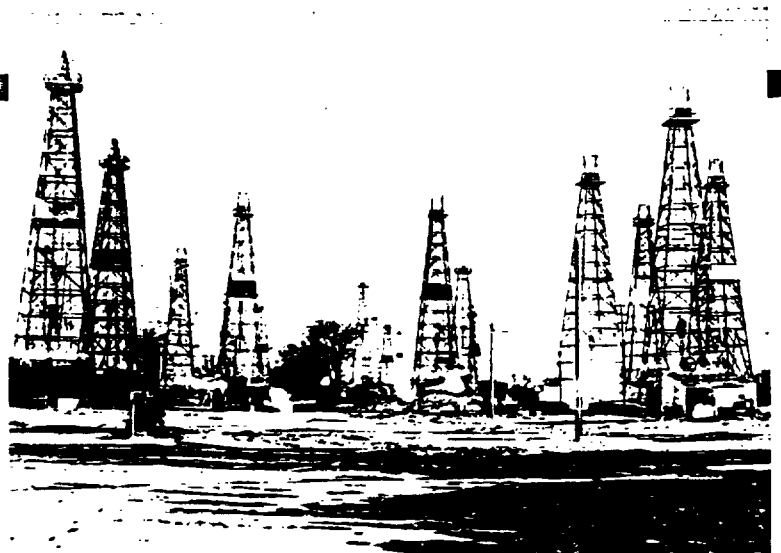
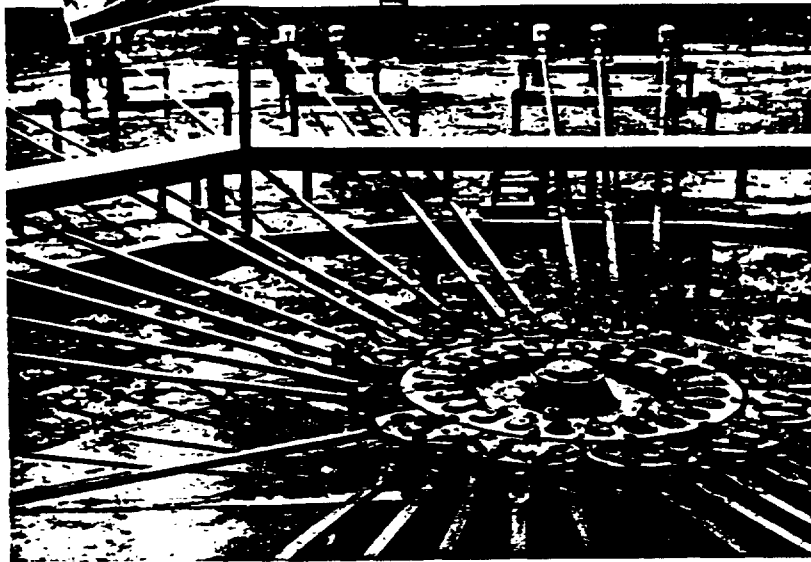
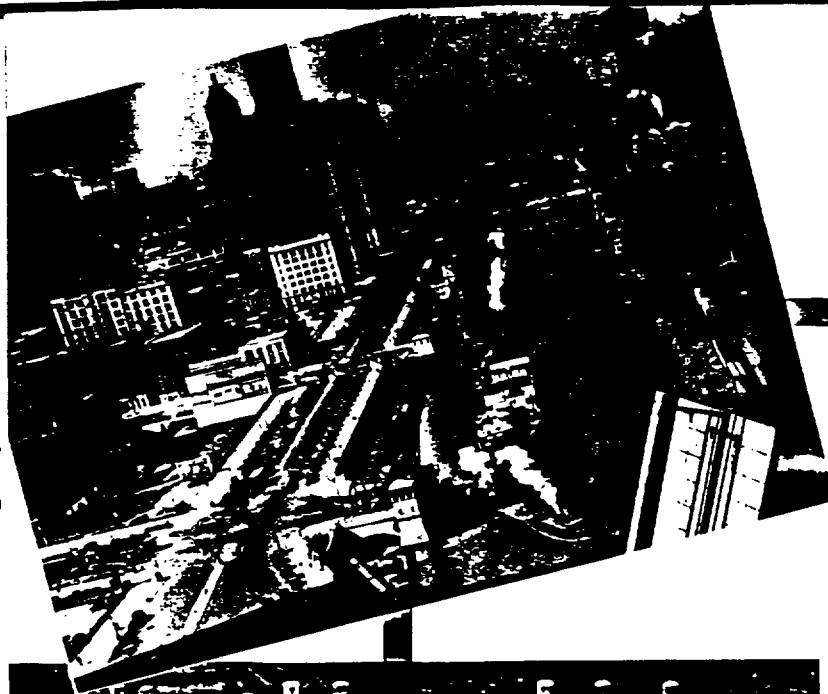
Excellent works of art often adorned earlier playing cards



Legend has it that the first cards made in this country were those painted on leaves by the sailors who came over with Columbus — in a fit of despondency and superstition they had thrown their own over the side.

Our "native pastime," the "Great American Game" of poker, originated, by the way, in Persia. Now containing adaptations from various French, English and Italian games, it came into this country via New Orleans under the French name of "poque." Southern dockhands did their best with the word, and drawled it "poker." Northerners, Westerners and Easterners have all done their best with the game ever since — and yet its age-old mysteries and idiosyncrasies still entice and betray their luck as they did the Louisiana levee hands long ago.

ILLINOIS



Top: Looking down on Chicago, big consuming market for Illinois oil
Center: A central pumping power unit hooks up many oil wells together
Bottom: An Illinois field at night, during the pre-war drilling boom

IT WAS THE year 1866. The Civil War had just ended. Men's thoughts turned to unifying the nation, settling the West, discovering and utilizing its resources.

Seven years before, oil had been found in western Pennsylvania. Why not, it occurred to many men, try for the black gold in what had been the fabulous Northwest Territory? Why not explore the Territory's historic southwest corner, where the map plainly showed a resemblance to a cornucopia, waiting to pour out Nature's bounty?

And so the Illinois basin — first termed the coal basin, now the oil basin — eventually became oil country. But not without painful trial and error. The 1866 attempt was a costly failure. So were others. Fiasco followed fiasco.

There was indeed oil in the Northwest Territory. Still, it was more than 100 years from the time its general geological character first became known until the oil was eventually found in really substan-

STORY

The oil fields of Illinois, phenomenon of the late 1930's, have proved to be of great strategic value during the war

By Keith Fanshier

tial quantities. But today, deep in the pocket of the southwestern tip of northeastern United States, where the Mississippi and Ohio Rivers form a junction at a sharp angle, lies an oil region which has been of great influence recently on the petroleum economy, and which probably has important future implications as well. This is the home of the Illinois basin oil fields.

Geographically, the nation's petroleum industry has tended to divide, with certain reservations, into the old East and the new West. The Illinois oil area refuses to classify itself thus neatly. It has partaken of the tradition of the East and the new day of the West. Here the twain do meet, even overlap. Southern Illinois carries characteristics of both.

The first wildcat oil operation of the state was that of Clark County Petroleum and Mining Company, organized in Marshall, Ill., approximately 80 years ago. The project resulted from the discovery of natural gas seepages nearby. It was unsuccessful, apparently partly so because of inability to handle water control.

It was four decades before crude oil production started in the state on a commercial scale. In 1905, with oil coming from a depth of some 400 feet, production was 180,000 barrels. It hit 4,000,000 barrels the following year, 24,000,000 barrels the next, and in 1908 attained a peak for the "old fields" of 34,000,000 barrels. That put Illinois in third place as an oil producer.

Subsequent years witnessed a decline — but the retreat from the peak didn't mean an end to drilling and prospecting. The older Illinois wells promised long life, and they performed on the promise, just as the newer fields are doing.

But in those early days the star of Oklahoma was on the ascendant, handicapping Illinois' development. Eastern oil men leapfrogged Illinois on their way to the glamour of the Southwest. Many never returned, or came back only after 30 years to participate in the Illinois play of the 1930's and 1940's.

Yet the wells of those "old fields" of Illinois, numbering now some 12,000, are still producing an average of nearly a barrel a day of crude each.

These "old fields" lie along the Wabash River in extreme southeastern Illinois. The "new fields" of the basin are somewhat to the west, in the state's central southern section.

Geology of the Fields

Geologists describe the Illinois basin as having a surface cover of glacial drift, 30 feet thick, of unconsolidated clay and sands left on retreat of the ancient ice sheets. This deep covering of its bed rock renders surface mapping impossible.

West of the LaSalle anticline, on which first production was found, early drillers became discouraged by salt water. Few tests went deeper than 2,000 feet. Subsurface charts indicated a rapid dip of formations to the west. For years

the region remained a sort of geologist's no-man's-land.

But discovery of oil in Michigan in 1927 revived interest in possibilities of the Central West.

Pure Oil Company is credited with opening the "new fields" area of southern Illinois. Cooperating with the Illinois Geological Survey, its geologists began restudying southern Illinois. A cross-section study was prepared running from Lawrenceville, in the heart of the old oil country, to St. Louis. The section furnished an interesting clue — a disturbance in the area between Flora and Olney.

Application of scientific methods of oil exploration, a reconnaissance torsion balance survey and reflection seismograph work, supported the finding of a structural disturbance across Wayne, Richland and Jasper Counties.

Actual drilling confirmed the geophysical work. These counties have produced much of Illinois' new oil.

The first new wells, drilled with standard cable tools, were not sensational. Pure Oil's Bradley well at Cisne, Wayne County, completed on March 4, 1937 in the Ste. Genevieve formation at 2,982 feet, had initial production of only 100 barrels. Meanwhile, Adams Oil and Gas Company had brought in a shallow Benoist sand well at 1,391 feet in the Patoka area of Marion County, 40 miles northwest, six weeks previously.

The whole petroleum industry felt the hair rise on the back of its neck at what happened next — at

Pure's third test well, on the Travis farm in the Clay City district of Clay County. Drilled with rotary equipment, the well came in from the McClosky lime of the Ste. Genevieve with initial production of 2,642 barrels.

Illinois evidently had come back with a vengeance.

For the next several years, southern Illinois experienced steady expansion in drilling and production, and brought forth such flush fields as Centralia, Salem, Loudon and numerous others. Today the producing counties are Bond, Christian, Clay, Clinton, Coles, Crawford, Edwards, Effingham, Fayette, Franklin, Gallatin, Hamilton, Jackson, Jasper, Jefferson, Lawrence, Macoupin, Madison, Marion, Montgomery, Perry, Richland, Saline, Shelby, Wabash, Washington, Wayne and White.

Some 230 producing pools in the area now have approximately 13,000 wells, slightly more than the old region.

Illinois reached its top daily production rate in June of 1940 when output hit 525,000 barrels a day. The Salem field then was running wide open, and other fields also were under highly competitive and intensive development.

Companies Active in Illinois

Besides Pure Oil, major companies most actively participating in southern Illinois oil have been Carter Oil, Texas and Shell. Firms operating on a smaller scale include Sun, Sinclair, Magnolia, Tide Water, Superior, Phillips, Continental, Gulf, Ashland and Deep Rock. Active also have been a host of smaller companies and individual operators. Low peacetime drilling costs, in fact, were particularly attractive to the individual type of operation.

The work of the independent oil

man and the small company in wildcatting and pool development has been a defining factor in the fields generally.

Despite variations in formation and depths ranging from a few hundred feet to below 3,000, the quality of Illinois crude is relatively uniform. It runs 37 to 39 A.P.I. gravity, with water and sediment usually below one-half of one per cent, and sulphur and salt content low. In general, it resembles good Mid-Continent field crude.

Development in the Illinois basin, in contrast to the old fields of the state, has had the advantages of today's advanced methods and techniques. Sand and limestone conditions, pressure maintenance, reservoir equilibrium, are factors for greatest ultimate recovery. Best engineering practice is proving its worth there in maximum recovery of oil. Extensive use of secondary recovery operations is an illustration of this.

The geographical location of the Illinois basin holds the key to ultimate importance of Illinois oil fields, just as in its development and early maturity period. It has a distinct advantage in its proximity to the central petroleum products consuming territory.

Despite increased efficiency and reduced costs of transporting crude and refined products over long distances, it will always be hard to overcome the advantage of an oil producing district near its natural market.

Accordingly, if original production cost is low — which here it is — if quality and adaptability of crude are good — which they are — and if the field has adequate facilities for moving its crude and/or products from that crude, it enjoys an undeniable superiority of position.

The Illinois basin lies not only at

approximately the nation's center of population but also within 200 miles of the industrial and commercial capital of inland United States: Chicago. It is thus nearer, by hundreds of miles, to central western refining centers and distribution and consuming centers, as well as to Great Lakes transportation, than any competitive source of crude of comparable size.

Considering that Illinois fields are served by generous-capacity pipe lines, of an aggregate potential well able to handle current production, they apparently are in good position for the postwar pressures for markets.

Wartime Value to the Nation

Illinois fields have been of great wartime significance because they have made the Central West more nearly self-sufficient in oil products at a time most urgently needed.

Had it not been for development of the basin, or something in its place, it might have required another "Big Inch" pipe line or at least a "Little Big Inch" — not only built but kept filled and operating from the Southwest and Gulf — just to take care of the essential requirements of the Central West. That would have meant several hundred thousand barrels a day added drain on supplies east of the Rockies.

Could the industry have withstood such a load? It is open to question. Certainly it would have delayed fruition of our war effort, the war would have been lengthened and our high strategy further burdened. Civilian motorists' consumption of gasoline might virtually have disappeared, at least in much of the country.

Thus, what seemed a market threat to the industry in peacetime turned out to be a priceless wartime asset to the nation.

Recurrence of flush production in the basin was considered in 1937-40 to have thrown the industry somewhat off stride. Some observers began to grow alarmed over possible market consequences.

Small refineries, several dozen in number, sprang up in the field abruptly. Both crude and refined products began impinging on established markets. At one time, Illinois crude constituted two-thirds of all the crude being processed in the central and Appalachian refinery districts combined.

But the feared collapse of the industry's price structure did not take place. There was a minor crude price easing in 1940, made up the following year. Refined markets, while they underwent some sagging perhaps attributable to Illinois, held fairly steady.

The industry never will know what would have taken place marketwise without Illinois. In the petroleum industry such speculation

is not conclusive, because of the complex relation of cause and effect. At any rate, Illinois was the industry's last big development prior to the nation's involvement in actual war.

The new fields have produced roundly two-thirds of a billion barrels of crude. Nearly half (300 millions) has been produced since the war started. If that volume of oil had not been available, the influence on the war program would be too obvious now to need dilation.

Illinois output undoubtedly would have been much larger 1942-to-1945 had not the war itself brought about restrictions on production and drilling. Much of the decline in Illinois oil production after 1941, it is conceded, came from reduction in scale of field operations resulting from war-enforced regulations. Nevertheless, possibilities were seen at mid-year, 1945, that the long downtrend in Illinois production, apparent since mid-1940, had been

halted and perhaps even reversed.

What about the future? Is the Illinois oil basin awaiting only a favorable opportunity to unearth deep production? Might the basin thereupon dominate the industry?

No one can be sure. Attempts to find deep oil there have not been promising in their results to date. The deepest test, an effort to find oil in the St. Peter limestone in the Cisne area, was dry at 7,175 feet. What lies in the 7 to 15 thousand foot ranges already tested in numerous southwestern areas, must await the drill.

But Illinois wells are noted for their consistent performance and long life. Although the state has no stringent conservation law, its oil now is being produced in accordance with sound practice and principles.

Whether Illinois oil experiences another flush era or not, it will long be an important factor in the petroleum industry.

Short Short Story



Maizie yawned. Her eyes drifted sleepily back to the row of empty hooks on the wall. "Well, I guess I can close up the joint. All the minks have gone home."

A lustrous heap on the floor caught her eye. She bent over curiously and picked up a tangled mass of jewelry.

"Cripes, this ain't stuff from the 5 and 10. I better turn this in to the boss . . . Hey, Nick, lookit what I found! Some dame lost her sparklers!"

"Thanks, kid, if nobody claims 'em, I'll give 'em back to you." And he carelessly slipped the string of pearls into his coat pocket.

Next day at cocktail time, Maizie was busily checking hats and coats and luscious furs when a well-dressed woman walked hurriedly into the night club, unescorted.

"Where's the manager? I've got to see him immediately! . . . Oh, there you are. Has anyone found my jewels? I lost

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UNLESS CHECKED**



them last night, and I'm almost crazy with worry."

Nick, polite, suave and sympathetic, turned to the woman. "I'm terribly sorry, madam. No one has turned them in."

Maizie's eyes narrowed. Under her breath she muttered: "The heel! The lousy, dishonest heel!" She wanted to run out from her check room, to grab the woman, to shout out: "Listen, lady, I found your jewels last night — and I gave 'em to him!" But fear held her back. Surely the manager would deny it. Her job would be gone!

With tight lips, Maizie watched the woman depart. Nick apparently unaware that the hat-check girl had overheard, walked smugly back among the neatly set tables.

Maizie's hand slipped reassuringly into her own pocket, where she fingered a small object. "I should never have given it to him," she said . . . "Anyway, I'm glad I kept the diamond clasp."

Oh Henry Legler

28,000,000 GALLONS A DAY

A new water purification plant at Baton Rouge puts
Old Man River to work doing a new job — for Ethyl

AS PART of the continuing expansion at the Ethyl Corporation plant at Baton Rouge, a new water purification plant, with a capacity of more than 28 million gallons a day, has been completed.

Water used for cooling and other

purposes throughout the many manufacturing operations at Baton Rouge was previously obtained the year round from underground well reserves. However, in order to relieve the drain on the wells, it was decided to turn to the nearby Mis-

Mississippi river water, now purified of its silt and sediment, overflows a weir on its way to a reservoir



issippi for eight months of the year when river water temperatures are sufficiently low to make it useful. But before the river water can be used, the mud has to be eliminated. Hence the new purification plant, which has been built at a cost of \$1,700,000.

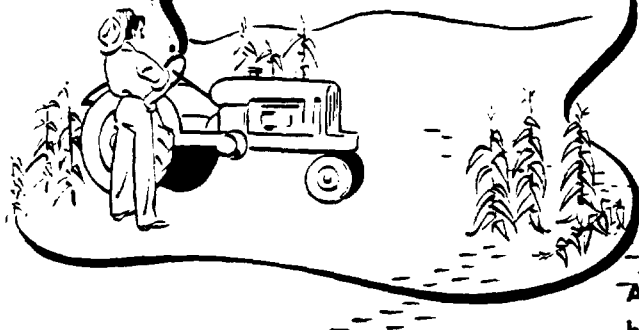
The new plant takes in 20,000 gallons of river water a minute, removes the impurities, and pumps the water to the plant reservoirs. Although this water is used entirely for manufacturing operations, it is now pure enough to drink.

The incoming water is taken from the river through a massive 42-inch pipe which has a capacity three times as great as that of the well known "Big Inch." The pipe feeds the water into the bottom of four parallel settling basins.

Enroute to and in the settling basins the water goes through an intricate process of treatment. Two chemicals, lime and ferrous sulphate, are fed into the water, causing the silt and sediment in the river water to agglomerate and form a thick floc bed below the surface of the water in the basins. Incoming water is fed below this floc layer and in rising through it accomplishes a reverse filtration, scrubbing out silt, sediment, and the floc. The treated water, now clear, overflows a weir at the end of the basin and is pumped to the plant reservoirs.

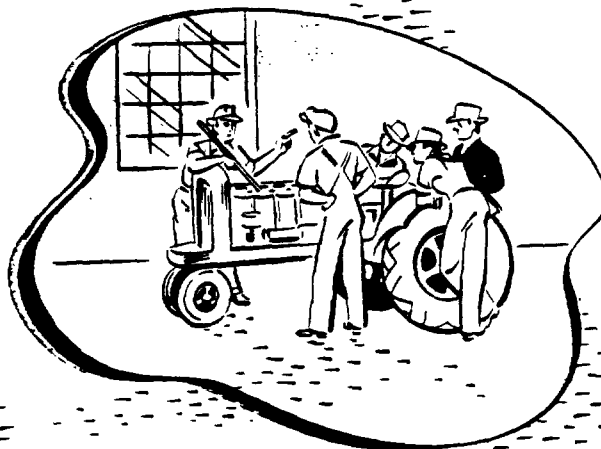
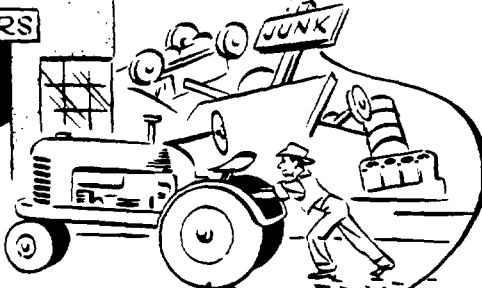
While supplying clean water for Ethyl's manufacturing operations, the water purification plant also serves another useful purpose in that the sediment it collects from the river water in the process of purification is used to fill in a nearby bayou. Approximately 45 tons of silt and sediment are collected from the settling basins each day. Some of it has been carried down by the Mississippi all the way from Missouri, Indiana, and Ohio.

SERVICE ON THE SPOT



REPAIRS

JUNK



A unique program, undertaken in New York State, has helped farmers to keep their old machinery running, thus maintaining their food production

THE TELEPHONE BELL rang imperatively. Picking up the receiver a man said, "County Farm Bureau Office." And from the other end of the line came the worried tale of a farmer in a nearby community.

His binder had broken down as he was starting to harvest his crop — just at the time when he needed it most. If he didn't gather in his crop within the next few days a whole season's work would go to waste — plus a lot of food. Could someone — anyone! — please help him out?

Half an hour later a truck loaded with a complete set of repair equipment pulled up in front of the anxious farmer's barn. Out of the driver's seat stepped an agricultural

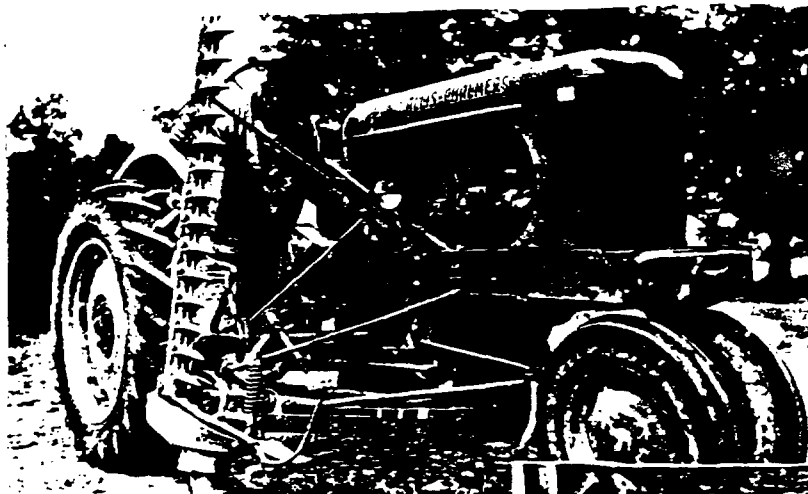
engineer who was an experienced farm machinery repair man. Within an hour the engineer had the broken machine back in service — to the farmer's amazement. Even more amazed was the farmer when the engineer said, "No charge," as he turned to go.

Emergency repair calls are but one of the many services New York State farmers are receiving under a unique, wartime program set up by the Emergency Food Commission of the State War Council. That program is the Emergency Farm Machinery Repair Program, centered at Cornell University in Ithaca, and fanning out to farming areas through the assistance of a corps of trained agricultural engineers.

This program, which has proved

so helpful in maintaining food production, teaches farmers how to care for their tractors and other farm equipment and to keep them operating efficiently. The program also shows farmers how to build and use labor-saving devices. It even shows farmers how to pull farm machines out of scrap heaps and from the dusty corners of barns, repair them and put them to use.

The way the program is set up, New York State is divided into 15 districts, with each district containing three to five counties. Each district has a district engineer who holds repair meetings, gives field demonstrations, and responds to SOS emergency service repair calls to help farmers keep their machinery in operation. The repair crews

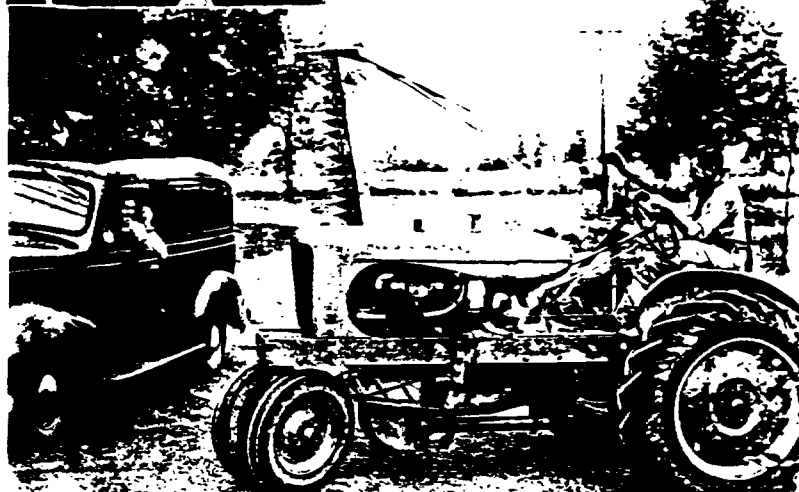


Emergency repairs, by trained agricultural engineers, have helped New York State farmers keep their equipment in service

handle anything — tractors, plows, grain mowers, corn harvesters, and milking machines. Their one purpose is to put these machines in condition and keep them at top operating efficiency.

For one year's operation, the program is said to have cost \$60,000. But the work it does has a value estimated at \$100,000 for the repairs and adjustments done on farm machinery alone. Figures, however, do not tell the full value of this program. The value is more properly measured in the increased production of food obtained and in the crops that were saved from spoilage. Moreover, it has helped these farmers to overcome the labor shortages that plagued them during the war.

There are other ways, too, in which the program has proved its worth. It has restored to useful service once-idle farm machinery at a time when new machines were scarce or just not available. It has even taken many machines from the junk pile and put them to work. It has saved tons of steel and other critical materials for the war effort. And it has demonstrated to farmers the importance of proper maintenance which will stay with them after the war.



Thanks to this farm machine repair program, many machines have been salvaged at the time of greatest need. Take, for example, the Sullivan County farmer who pulled a discarded corn binder from the county junk pile. He took it to a repair meeting, brought \$15 worth of repair parts, and worked on the binder during several repair sessions. As he

worked on the machine, he had the advice and assistance of the trained agricultural engineer in charge. And a couple of days later, he was able to take it home in good working order. He later used the binder to harvest his field of corn.

Since the program started shortly after Pearl Harbor some 800 repair meetings have been held with a total attendance of 40,000. More than 7,500 machines have been repaired at these meetings under the supervision of the district engineers.

The repair meetings are usually held in the mechanical department of a local school, and last from three to five days. During this time machines being put in first-class condition serve as excellent laboratory material to the farmers attending.

After these clinics some of the farmers assist their neighbors, who did not attend the meeting, to make similar repairs on their equipment.

The types of machines brought to the repair meetings vary from small hand tools to tractors. To one typical repair school were brought six tractors, three tractor plows, two corn harvesters, two ensilage cutters,

a milking machine pump, and a lard press, among other machines.

As contrasted with the lengthier repair meetings, field demonstrations are held during certain times of the year when the weather is favorable, and last from a few hours to a whole day. These meetings are held out in the open fields where proper adjustments are demonstrated with a machine in actual operation. Most of the farmers attending these meetings must be "from Missouri," for they frequently bring their worst machines to these demonstrations — and have them repaired on the spot. This gives the district engineer a chance to show how much the correct ad-

justments mean to the top efficiency of a farm implement.

When a district engineer is not conducting meetings he is kept busy responding to emergency service calls. Farmers whose machinery breaks down at a critical moment send out a hurried SOS call, which is usually relayed from the County Farm Bureau Office to the nearest district engineer. The engineer, driving his completely equipped truck, then hurries to the trouble spot and proceeds to help the farmer make the necessary repairs. Aboard the engineer's truck is a complete set of equipment, including an electric welding outfit, electric grinders, electric drill, a powerful press

for straightening bent parts or removing bushings, and regular and special tools in great variety.

Most service calls are of an emergency nature, and many a farm machine has been repaired in the nick of time to keep a large crop of hay or grain from getting wet as a result of being left in the field unharvested, or to keep potatoes or fruit from becoming diseased due to a sprayer breaking down.

Of necessity, the district engineers are walking encyclopedias. They have had to handle many requests for information and assistance in the construction of buck rakes, baled hay elevators for both field and barn, power-operated hay

Besides filling the immediate need of keeping vital farm machines going, the program has also taught farmers the importance of proper maintenance



ETC 32178



As part of the wartime program, farmers were invited to local repair meetings. Above, installing high compression pistons in a tractor

hoists, lime and fertilizer spreaders, and many other specialized tools that aid farmers to step up their production.

The emergency farm machinery repair program got underway in 1941 when 15 district engineers were hired. They were given two weeks of intensive training in the Department of Agricultural Engineering at Cornell University before beginning their work. In addition, they are now called in four times each year for instruction in special subjects. Part of their training has consisted of a special course in the advantages of high compression over low compression tractors, which was given by Frank Stablein, a tractor engineer of Ethyl Corporation.

Each district engineer was provided with a light panel or pick-up truck which was equipped with the tools and special equipment neces-

sary for the work. A two-ton truck having a special enclosed body was purchased as a supply tender for the engineers.

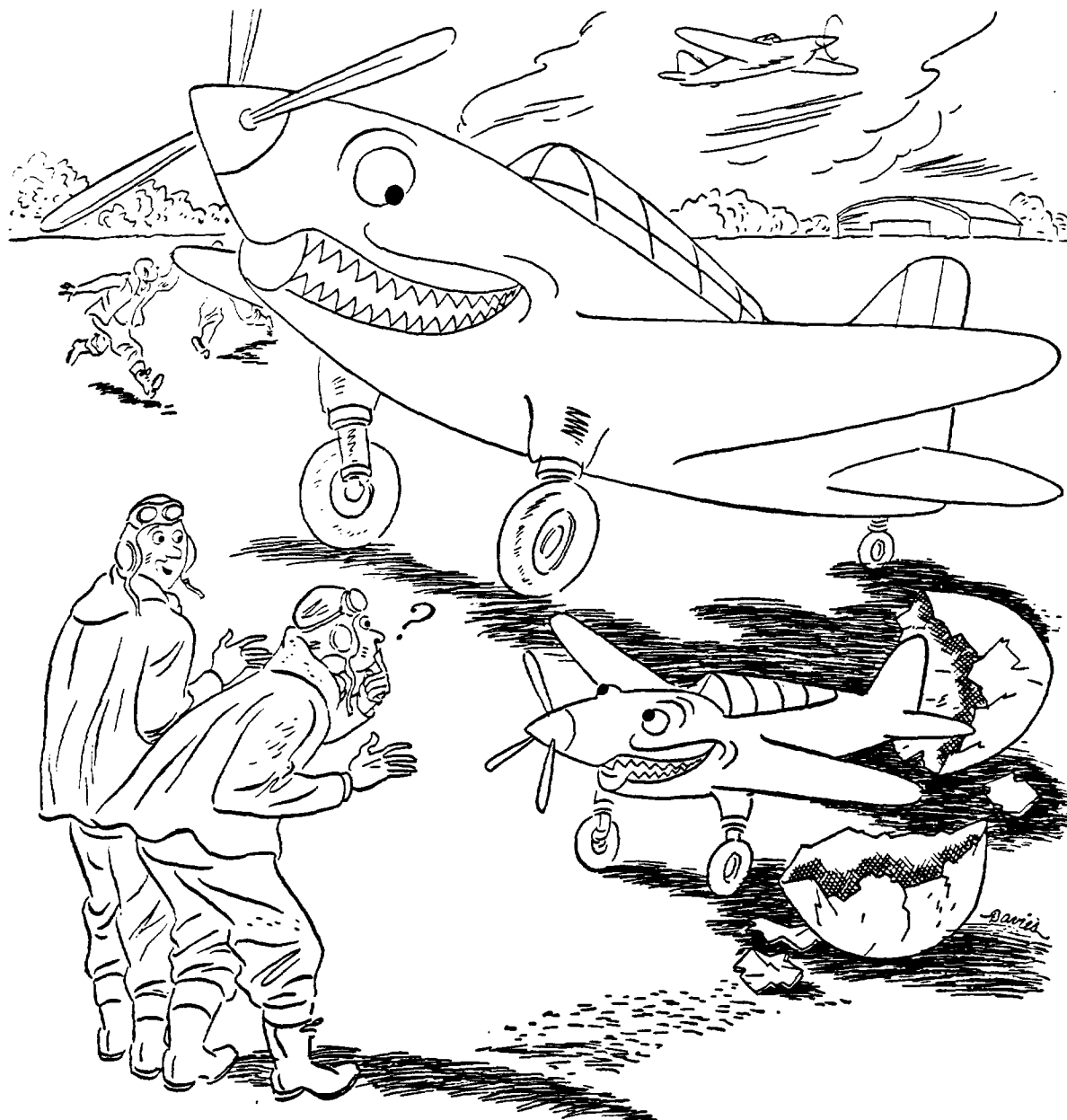
This whole program has not only helped farmers; it's been of benefit to tractor dealers, too. For one thing, it helped to teach farmers the importance of keeping their farm machinery in good working order at all times. Also it has helped the dealers to be of better service to their customers — by having farmers come in for repair parts and servicing during off-seasons of the year, thereby spreading out their peak season load.

Even though the war is over now, the emergency farm repair program promises to be of great service in the coming months. This is because ample supplies of new farm machinery are still some time away for the average farmer. Meanwhile the farmer must keep his present equip-

ment in repair in order to do his important job. Perhaps the greatest benefit of the program lies in the lesson it has taught many farmers, a lesson that will carry over long into the peacetime era. That lesson is to keep farm machinery in repair and properly serviced at all times.

OUR PICTURES

Cover by Julius J. Fanta; Pages 3 and 5, courtesy Automotive Safety Foundation; Pages 6 and 19, illustrations by Rodlow Willard; Pages 11-13, courtesy New York Public Library; Page 14 (top), Ewing Galloway, (center) courtesy Pure Oil Co., (bottom) Centralia (Ill.) Evening Sentinel photo courtesy World Petroleum; Pages 20 and 22, courtesy N. Y. State College of Agriculture, Cornell University; Page 21, courtesy Soil Conservation Service, U. S. Department of Agriculture.



“ Even if I reported this, the CO wouldn't believe it! ”

So many new aviation ideas have been hatched during wartime that it is easy for the general public to slip into the belief that major aviation progress is possible only during wars.

Nothing could be further from the truth. Many developments hailed as wartime discoveries were in practical use long before the beginning of hostilities. The needs of war served to speed their production. Furthermore, the emphasis on military aviation has tended to sidetrack the development of commercial and private aircraft. This lag must be made up by strengthening of research programs, rather than their abandonment.

For example, engines must be developed to realize the full possibilities of future aviation fuels from both performance and economy standpoints. Aviation gasoline has already burst

through its “ceiling” of 100 octane. New refining methods and the use of Ethyl fluid have provided new fuels so high in anti-knock quality that some means other than the “octane” scale will be required to express their ratings.

Post-war research workers, unhampered by the specialized requirements of military planes and fuels, may well make the years after the war the truly great era of aviation progress.

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ETC NEWS



ETC 32182



After a two-year period of service with the Petroleum Administration for War, E. Oliver Jones, Jr. has rejoined the Ethyl Corporation. He has been named a staff assistant to Julian J. Frey, General Sales Manager, and will help in coordinating the product and service requirements of customer oil companies for Ethyl's sales department.

Before joining the PAW, where he served as a special assistant to the Director of Refining, Mr. Jones was associated with Ethyl Corporation for a period of 11 years. Originally he served as a field representative in New York State and later in New Jersey. In 1937, however, he transferred to safety work for the company on the West Coast and in Cincinnati. At the time he left to join the PAW, in 1943, Mr. Jones served as acting assistant manager of the Safety Department.

A native of Columbus, Ohio, Mr. Jones attended the Massachusetts Institute of Technology. Following his graduation in 1924, he was for several years associated with the Consumers Power Co., of Jackson, Michigan, and later was assistant sales manager of the Bonney-Floyd Co., of Columbus, Ohio. In the last decade, besides serving as a safety specialist for Ethyl, he has participated in the safety activities of the oil industry at large.

IN THE

ETHYL NEWS

OCTOBER 1945

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Succeeds Earl Bartholomew, newly appointed General Manager of Research Laboratories. 3

INTERDEPENDENCE IN FUEL AND ENGINE RESEARCH

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PIONEER PIPELINE

Two inches of trouble five miles long! That characterized the battle to build and to operate the first pipeline in the United States. 8

AIR FREIGHT TAKES OFF

The war has set a brand new pattern for the airlines. They intend to develop their freight business on an unprecedented scale — and here's how. 9

SHORT SHORT STORY

TUNE UP THAT CAR!

More power, better performance and greater fuel economy than ever before — these are what present improved grades of gasoline offer motorists. But to get the full benefits out of these postwar motor fuels, the greatest tune-up job in history lies ahead. 13

DID COLUMBUS MISS THE BOAT?

He didn't know where he was going — know where he landed — know where he had been. That's what the wiseacres say. But maybe Columbus had a different idea entirely from what the history books say, when he made his famous error in navigation. 14

20 GALLONS OF SEA WATER FOR EACH GALLON OF GASOLINE

As the wartime demand for aviation gasoline soared, the need for ethylene dibromide, essential ingredient of Ethyl fluid, skyrocketed half again as fast. Requirements were met by old and new sea water plants. 19

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

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

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

Earle W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzalez, secretary

ETC 32183



JACK MACAULEY JOINS ETHYL ENGINEERING RESEARCH

**Succeeds Earl Bartholomew, who has been promoted to the newly
created post of General Manager of Ethyl Research Laboratories**

INITIATING a program to widen the scope of Ethyl's research service to the oil and automotive industries, John B. Macauley has been named Director of Engineering Research. He succeeds Earl Bartholomew, who becomes General Manager of Ethyl Research Laboratories.

Rapid as was the progress in fuel and engine design before the war, such progress is expected to accelerate greatly in the period just ahead. Accordingly, Ethyl's research laboratories are being organized to be of maximum service to oil companies and to manufacturers of en-

gines and engine parts.

Although a newcomer to Ethyl, Mr. Macauley is no stranger to the problems of engine design for the utilization of higher octane motor fuels, having been active in the original high compression program of the Chrysler Corporation which led to the marketing of the famous Chrysler Red Head engine twenty years ago. From 1931 to 1935, he was Chief Engineer of the Chrysler Division of the Chrysler Corporation, and in 1935 was promoted to Director of the Engine Laboratories for Chrysler.

For the past two years, Mr. Macauley has been Chief of Applied Research for the Pratt & Whitney Division of United Aircraft Corporation, East Hartford, Connecticut.

A native of Washington, D. C., Mr. Macauley attended the University of Illinois as a member of the class of 1918, but interrupted his studies at the outbreak of World War I to enlist in the Marines, serving overseas with the First Marine Aviation Force. He began his civilian career with the Packard Motor Car Company and later worked for the American Brake Shoe Company.



Ethyl's Detroit Research Laboratories on West Eight Mile Road

Wider scope for Ethyl's research is being developed to deal with the growing complexity of problems in fuel and automotive research

INTERDEPENDENCE IN FUEL AND ENGINE RESEARCH

RESEARCH in both the oil and automotive industries was increased manyfold in the pre-war period, and this trend is being accelerated as numerous companies plan larger and more modern laboratories. Developments now rest on a foundation of data and relationships built up by years of organized intensive research.

"In our research programs with oil and automotive manufacturers," says Earl Bartholomew, General Manager of Ethyl Research Laboratories, "we are constantly faced with the interdependence of the engine and the materials which enter it. The problems of engines, fuels, lubricants and fuel and lubricant additives are inseparable. Progress in the solution of one problem usually affects the others."

This interdependence of engines, fuels, lubricants and additives (in-

cluding Ethyl fluid), characterized many of Ethyl's research endeavors before the war, which accompanied the development of the high compression engine. It played an important part again during the war, when Ethyl's research facilities contributed to the solution of problems of the armed forces in getting the best performance out of military equipment under unprecedented combat conditions. And it is a guiding principle now when the great strides taken in refining technology during the war are available for peacetime motor fuels.

But in the expanding fields of fuel and automotive research, the problems of the chemist, the engineer, the research scientist grow infinitely more complex.

Available now, for peacetime purposes, are all of the great advances in refining technology which were

of such decisive influence during the war. But the design of automotive engines, for the maximum utilization of the vast potentialities of the new gasolines, will not be easy. The necessarily higher pressures introduce problems of roughness, rigidity and stresses, and the need for new materials of engine construction. Higher pressures bring increased temperatures of compression which more nearly approach those of self-ignition. Nevertheless, the potential benefits are irresistible, and automotive engineers are pursuing the problem with their characteristic vigor.

As a corollary to this, the petroleum industry now has the choice of many refining processes, a large number of which are relatively new. Many of the processes may be varied in operation to produce fuels having a range of characteristics in numer-

ous respects, including sensitivity to tetraethyl lead. In the selection of refining equipment, the objective is the highest quality of product per unit of cost. Yet quality, particularly with respect to antiknock, is not measured by a fixed yardstick but is a function of engine characteristics. As a consequence, plans of the petroleum industry must be based on the best estimate of future engine design which, in turn, is reliable only to the extent there is an understanding of basic engine-fuel relationships.

Similarly, as more of the possibilities of the gasoline engine are realized in practice, the requirements imposed on crankcase oils become more rigorous. In order to meet these more severe engine conditions, new methods of refining must be devised and chemical additives incorporated.

New refining methods for fuels and lubricating oils, additives for gasoline and oils and a wider range of materials of engine construction are essential to progress. But, as can be seen, they create problems of compatibility which add to the



This device measures spark advance and engine speed of a car in operation. The equipment also has a potentiometer, insensitive to car motion, which measures temperatures

scope and complexity of the research program that accompanies developments in all three fields.

This suggests an important need. As the petroleum and automotive industries expand their technical activities in recognition of the growing complexity of the environment in which engines are developed and

operated, there is need for a proportionate increase in cooperative effort.

And it is along these lines—coordinating and correlating these separate streams of research, lending technical information and assistance to the oil and automotive industries—that Ethyl's Detroit Research Laboratories look forward to an era of increased service and usefulness. The new program embraces increased participation in the augmented activities of such organizations as the Coordinating Research Council, as well as cooperative research programs with individual oil and automotive companies which have always constituted an important part of Ethyl's entire research effort.

With a background of two decades of experience in the field of fuel and engine development, coupled with modern research facilities, Ethyl's Research Laboratories embark upon an era of fuel and engine progress which promises to be even more fruitful than the past.

A fleet of passenger cars, housed in the garage of the Detroit laboratories, is used in the road testing of fuels



PIONEER PIPELINE

By Harry Botsford

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

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

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

This state of affairs threatened the very life of the industry by imposing unreasonably high charges for hauling oil to refineries or the railheads. By 1862 the situation was critical and industry leaders welcomed the advent of J. L. Hutchings, an engineer who came to the oil fields with a new type of rotary pump and an ambitious plan to install and operate a pipeline between Tarr Farm and the Humboldt Refinery, a few miles away. A two-inch line was laid, but the joints were so

poor that the line "leaked like a fifty-cent umbrella," according to the oil field press. The teamsters were delighted at the failure, again raised their rates.

However, in 1865 Samuel Van Syckle, engineer, capitalist and a real fighter, arrived at Pit Hole City and announced that he would build a pipeline that would operate efficiently. Further, he announced that inasmuch as the Commonwealth had given his company the status of a common carrier, he would oppose with every legal means any opposition staged by the teamsters. These were fighting words, but cheering to industry management.

His line was two inches in diameter; because he was a sound engineer, he insisted that the joints be leak-proof. The distance was about five miles between Pit Hole City and the railhead at Miller Farm. There were to be two pump stations along the line.

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

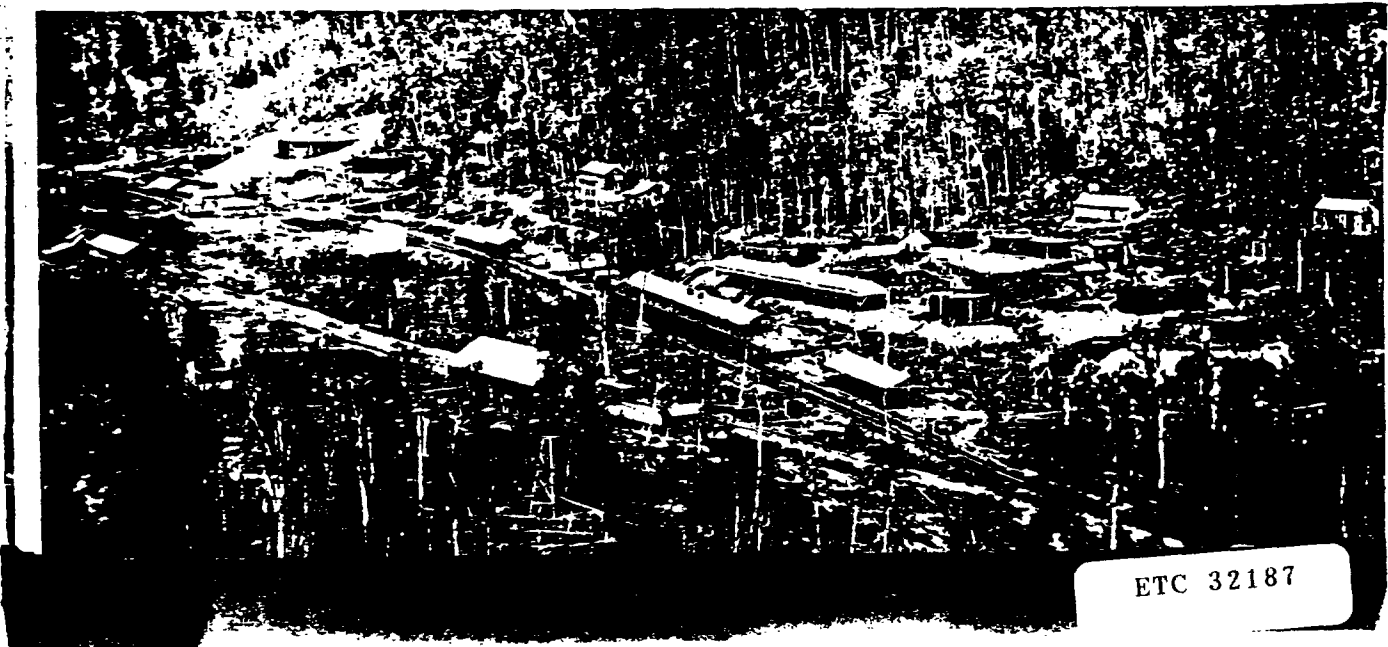


charged by the teamsters.

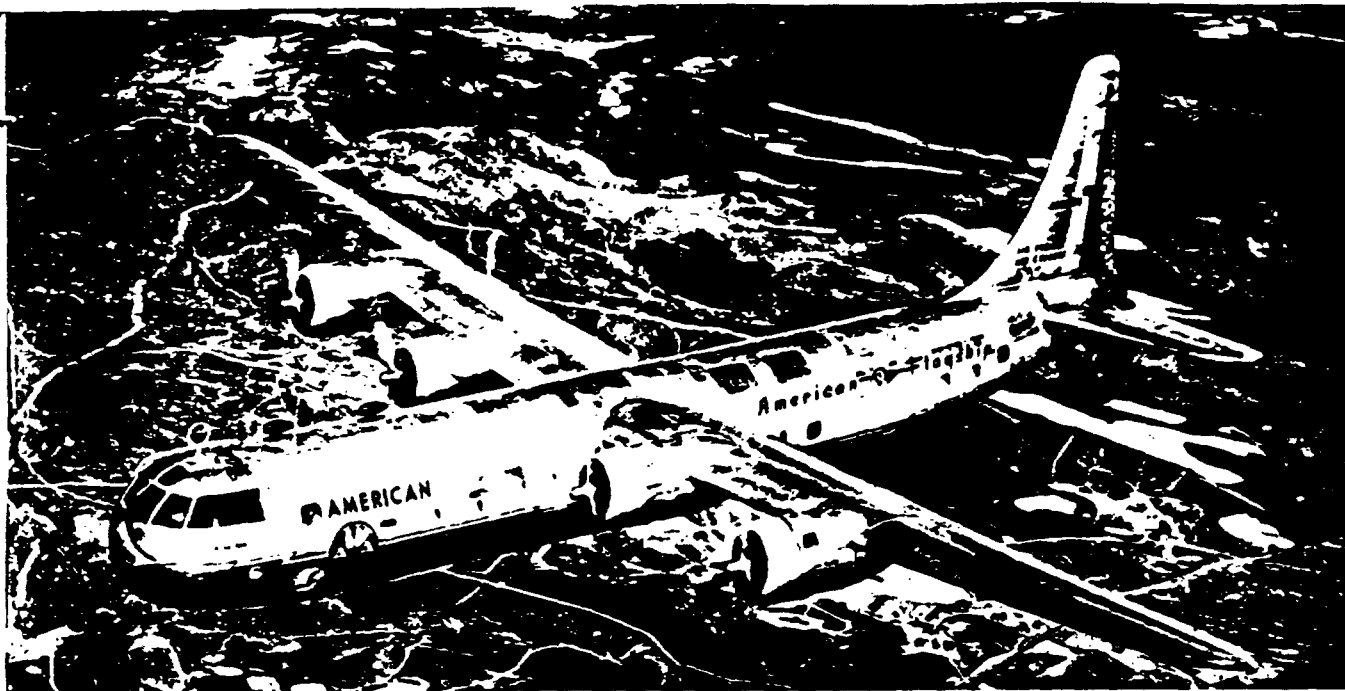
The teamsters held indignation meetings, listened to a gospel of violence, made many attempts to destroy the new competition. Van Syckle, however, anticipated such raids, had his line well guarded. There were casualties on both sides for a period. Then the more sober of the teamsters recognized that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

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

The Miller Farm at Oil Creek, Pa., was the terminus for Van Syckle's pipeline from Pit Hole



ETC 32187



This Consolidated M-39 Airfreighter, with a 9½ ton payload, flies a variety of cargos to the West, fresh fruits and vegetables back East

Air Freight Takes Off

By Preston Wright and
Roger Williamson

The commercial airlines look forward to a greatly expanded volume of air freight in the present era

RUSH

That one word, pasted on packages, just about spells the future of moving cargo by air. It has started a brand-new transportation system, now in its infancy, but with an almost unlimited future—when people who label their shipments “RUSH” come to realize that airplanes are the best answer to their problem.

There are still some people who ask, “Can airplanes carry freight?” You might as well ask an air transport man if ducks can swim.

The answer is that airplanes *are* carrying freight, that they have done a whale of a job during the war, and that the commercial airlines have

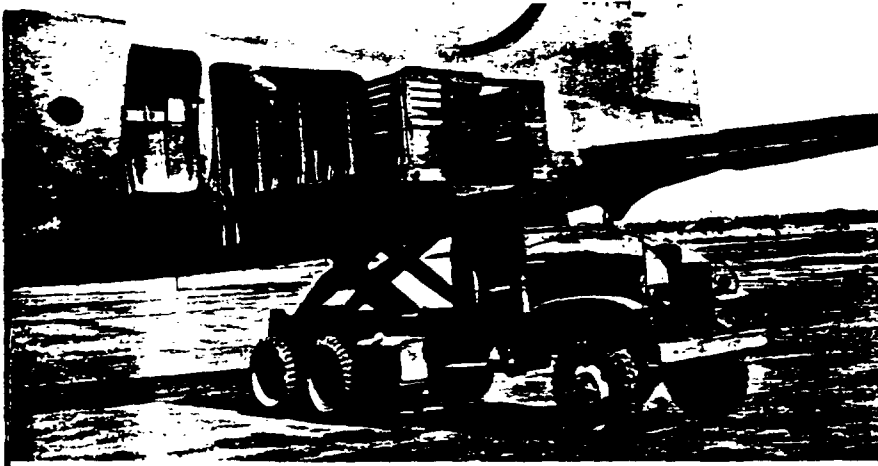
only scratched the surface of a potentially great business.

What about air freight now that the war has ended? In 1940, only 4½% of the total revenue of Pan American Airways came from air express. How could a businessman consider sending his commodities by air when he knew it would cost him roughly 150 times more than sending it by steamship? Everyone knows the backbone of transportation systems since time immemorial has been the carriage of freight. But aviation, having just attracted the cream of surface *passenger* traffic, had hardly tasted the rich milk of the great freight business.

It is significant that, in spite of the meager airline express business in the past and the extremely high

rates charged, express ton-miles have shown a steady increase. In ten years, airlines increased their ton-miles flown annually from 200,000 in 1930 to 3.5 million in 1940; the latter figure represented \$2 million in revenue. As a part of total airline revenue, express revenue rose from a tiny 0.3% in 1931 to an even 4% in 1940. However, the rates were still so high (80 cents per ton-mile in 1940) that it would cost about \$2,400 to fly one ton from coast to coast.

This is very costly when one recalls that speed, aviation's main offering, is essential only as the length of haul increases. In country like South America, however, where difficult terrain interferes with surface transportation, the plane can some-



Warlike experience in handling freight has raised the airlines' peacetime sights, also taught them new tricks

is of distinct advantage to the manufacturer and wholesaler. These, then, are the kinds of freight business for which the airlines are eagerly bidding.

In the field of shipping perishables, once again, perhaps the most ambitious effort to date has been made by American Airlines. The company has been operating a large Consolidated-Vultee model 39 on a contract basis for a large California grower. The ship has a 9½ ton payload as compared to the 3½ ton payload of the DC-3's previously used.

Flight of the M-39

While carrying all types of perishables to the East, the ship has also carried a variety of loads on its westward flights. The latter have included such items as steel stripping and gas ranges. Though less important as a commercial venture, the ship's flight from Bridgeport, Connecticut, to San Francisco, with a load of B-29 parts, has been its most spectacular. The ship left Connecticut at 5:45 P.M., EWT and reached the Coast at 10:18 P.M. PWT. Speed of this type will be available on a commercial basis in the not-too-distant future.

Cost information on the experiment is still limited, but it has been stated that carrying a full load from

one consignor to a single consignee would mean a freight charge of about 15 cents per ton-mile. Naturally, this low fare could not be charged except under the ideal conditions noted above, but it shows how rates may be ultimately lowered.

Although using the less spectacular DC-3, other airlines have stated that their experiments have convinced them of the wisdom of expanding their cargo activities. United Airlines, with eight DC-3 "Cargoliners" in service, is currently flying 19,525 miles daily over its coast-to-coast route. C. P. Graddick, United's Director of Air Cargo, declares flatly that his company's cargo planes "have proved their economic value." When such a statement can be made in the industry's present state of development, the future indeed looks bright for air cargo as further improved and more economical planes become available.

And along with new planes will come new methods of operation and traffic control which should make air transport more dependable than ever before. The use of radar, for instance, should cut cancellations due to weather conditions to a minimum.

Air cargo, being the world's newest transportation infant, gives its

promoters a multitude of problems both technical and economic. The engineer, with his blueprints, the research man with his market analyses, and, above all, the advertising and sales men who must sell this service to the public, have a terrific job to do. But pessimistic statistical projections of past air express volumes do not deter them. Mr. Wooten, of American Airlines, says optimistically, "Just as the railroads led to the development of the fresh meat industry and the grain industry in mid-western states, the greatest potential traffic for Airfreight lies in the development of new commodities and new merchandising methods. Innovations, improvements, that previously were not practicable, can take place with Airfreight — a new kind of shipping — which ends many previously existing limitations in transportation, handling, and packaging."

Army-Navy Record

Of course, air cargo had its greatest day during the war. Up to now, the famous Army Air Transport Command alone has flown over half a billion miles. In ton-miles, it flew over 320 million in 1941 and over 858 million in 1944. Similarly, the Naval Air Transport Service, from July, 1943, through March, 1945, flew 335,377,995 ton-miles to deliver over 123,000 tons of cargo and mail and to carry over 800 thousand passengers.

The airlines, which taught the military services a few tricks at the beginning of the war, will now undoubtedly take a page out of this large volume regarding handling procedures, communications, and streamlining of operations in general.

Because of both political and economic difficulties, international air cargo progress will probably be

slower, but here again, it is inevitable that it will grow. In fact, the ultimate gains in this field will probably be greater than domestically. The reason for this is the large speed gap between the steamship and the airplane; trips formerly measured in periods of weeks will in the future be measured in periods of days or even hours. Just as shipping interests developed refrigeration and introduced the banana to us, so will the airlines develop entirely new markets.

As we have seen, the airlines were charging an average of 80 cents a ton-mile for air express in 1940 and did 3.5 million ton-miles of business. Since then, air express rates have been reduced to about 72 cents per ton-mile, and domestic airlines are now able to quote air freight rates of 26 cents per ton-mile. Dr. Edward P. Warner, a member of the Civil Aeronautics Board, thinks that, in the not-too-distant future, we should be able to get airport-to-airport costs down to 14 cents a ton-mile. This

would permit rates—including pick-up and delivery—of about 20 cents a ton-mile. Thus, it may be fair to assume that, within the next five years, domestic air carriers will be doing an annual business of 250 million ton-miles, or a growth of something over 70 times the prewar volume, authoritative spokesmen believe.

Coast-to-Coast in 6 Hours?

Experts who make such predictions would be the first to admit that they are purely theoretical estimates based on equipment we are now using. Even greater gains may be scored as still better planes come along. For example, if the engineers can develop a plane which will cross the continent in six hours (as has been the case with at least one model) and which can still be operated profitably—charging, say, 15 cents a ton-mile—the future seems practically unlimited. Not only can a new market be established, but an additional amount of business may

also be created for surface carriers.

The point to remember is that all concerned with the aviation industry feel sure that such equipment will be produced sooner or later. During the war, the industry did many things which, five years ago, would have been considered impossible, and there is every reason to believe that, in peacetime, it will continue to do the impossible.

Paul Pate, director of air cargo for Delta Airlines, states the prospects as realistically as anyone: "We don't anticipate performing mere transportation of goods for some time to come. We leave that to the water, rail and truck carriers. If a shipper just wants his goods moved from one place to another, then he will not profit by air shipping. But, if he wants his material delivered with dispatch, flying is his answer. Who are the shippers who need air service? All of them, from fertilizer manufacturers to blenders of exotic perfumes. All have some shipments marked 'RUSH.'"

Short Short Story

By Oh Henry Legler

HERMAN THE HACKIE

The garage mechanic was nuts. Nineteen bucks for a new muffler! "I'll let the old hack fall to pieces first," said Herman.

He spat in disgust through the half-closed window of his De Luxe Taxicab, as it rattled through the night along bumpy 3rd Avenue.

That stink in the back seat wasn't carbon monoxide gas. Any dope knows that carbon monoxide doesn't smell. Herman was pleased with his own shrewdness.

He spoke over his shoulder to his lone passenger: "Say mister, what was that address again?"

There was no response. Herman opened the glass partition back of the driver's seat and called again: "Hey, mister, I asked you . . ."

A vile odor of exhaust fumes poured through the crack. Herman glanced around and saw the form of a man slumped over in the rear seat.

He stopped the car, opened the back door. "Je-sus, the guy's dead! I better call a cop."

Wait a minute, Herman. You can't do that. The coroner

will say: "Death-from-carbon-monoxide." It's your fault, Herman.

The mechanic warned you. "Manslaughter" — that's what the judges will say. Don't call a cop. Get rid of the guy — quick!

The fast, swirling tide of the East River muffled the sound of two splashes — the first one, Herman's passenger — the second, the man's black leather satchel. "They ain't going to pin no evidence on me," said Herman.

The next afternoon the hackie was scanning the evening papers for reports of missing persons when a headline caught his eye:

POLICE RECOVER \$160,000 BANK LOOT

Early this morning the New York harbor police found a black leather satchel containing the \$160,000 in cash stolen last night from the Sterling Trust and Savings Bank. It was floating on the East River. There was no trace of the lone bandit for whom the bank had offered a reward of \$10,000, dead or alive.

"Well damn my soul," said Herman.

★ **Everybody "knows" where Columbus**
 ★ **was going when he set sail — but**
 ★ **maybe he wasn't headed there at all**

Did Columbus

By John E. Kelly

WHEN CHRISTOPHER COLUMBUS stepped ashore on the island of San Salvador 433 years ago this month, he not only made his mark as the greatest discoverer of all time — he laid the basis for a controversy that will not down.

This arises from the common belief that Columbus had set sail for the East Indies and Japan, but through a slight error in navigation wound up in the Caribbean, some 10,000 miles away.

This is the accepted version of history.

But against this prevailing belief there is evidence to suggest that maybe Columbus wasn't headed for the Far East at all — that he was shooting for a much nearer goal. And that goal may have been Antilia, that half-known, half-legendary land west of the Azores, whose existence was the subject of much speculation in trade-hungry fifteenth century Europe.

The discovery of America so profoundly altered the course of civilization that it is interesting to peer beyond the twilight of confusion and myth that still surrounds it. Who was Columbus, in the first place?

Those who would gild the lily have ascribed to Columbus a mysterious illustrious parentage and a university education. His achievement is the greater in that he was the son of humble wool carders, born in poverty in Genoa in 1452, and came up the hard way.

As a boy he was apprenticed to a weaver, ran away to sea at 14, and engaged unsuccessfully in trade five years later. Many of the voyages of



One of many artists' conceptions of Columbus

his youth are the inventions of his biographers of the sixteenth century, but as a young man he travelled to Greece, England, Ireland and perhaps to Iceland, laying the foundations of his mastery of the sea. On one of these early journeys, his ship was attacked by a French pirate surnamed Coullon or Colombo, from which some have sought to trace the derivation of "Colum-

bus," but the contact was apparently purely coincidental. Columbus escaped the Frenchman and their paths never crossed again. In 1478 he settled in Portugal and married the niece of the Archbishop of Lisbon, thereby attaining a position of consideration in the Portuguese Court.

As a man, Columbus was patient, shrewd and articulate. He fre-

Miss the Boat?

quented seaports and spent much time drinking and talking with sailors, picking up scraps of information until he had sufficient data to convince himself of a short and successful voyage — and riches.

It should be remembered that the concept of geography was at a turning point in those days. Explorers and cartographers, merchants and courtiers stood on their heads trying to figure things out. All hands agreed on what was needed, a new water route to the East, since the Turkish seizure of Constantinople, in 1453, had cut the overland Silk Road that Marco Polo had travelled.

Columbus, as everybody now knows, spent nine fruitless years in Portugal, vainly trying to convince people that he knew of new lands ready for the taking. Another five years dragged out in Spain, with an equally conspicuous lack of success. Finally, Columbus was considering an invitation to London, following an exchange of letters with British court officials, when Queen Isabella at last broke down and put up the money to finance the expedition.

And so it was that on August 3, 1492, three little vessels, the *Nina*, the *Pinta*, and the *Santa Maria*, hoisted their sails into the wind and began their incredible journey. Seventy days later, they dropped anchor in the Caribbean. The rest is history.

But even though Columbus did land in America (which is what counts), where did anyone get the idea that he had been heading for Asia? From the history books. Where did the history books get their information? As is so often the case in medieval occurrences, some evidence is presented.

To support the view that Columbus was headed for Asia, several documents are most frequently cited. One is a letter said to have been written by one Paolo Toscanelli, a Florentine physician and cosmographer of some standing. Another is the Log Book which Columbus kept of his voyage.

As to the Toscanelli letter, in it the physician is said to have advised the King of Portugal, Affonso V, that the coast of Asia could be reached by sailing from Lisbon a little south of west for a distance of but 130 degrees. This letter was supposed to have been written in 1474 — but no one has ever seen the original. It is not in the Portuguese State Archives, and Italian and Portuguese writers of the period are uniformly silent about it.

There is, however, another letter written by the Florentine physician, which is very much in existence. And this one directly contradicts the earlier epistle to the king. Here he advises Affonso, whose nation was then most active in seeking a water route to the fabulous East, to follow the African coast line, turn at the Cape of Good Hope, and cross the Indian Ocean.

The first mention of Toscanelli's disputed letter was in 1571, or 97 years after it was ostensibly written. Advanced by the explorer's son, Fernando Columbus, and his clerical advocate, Bartolome de las Casas, it was produced at a time when such a document was necessary to protect the fame (and estate) of Fernando's father. There are several versions of it, in Latin and the Romance languages, containing matter incomprehensible as coming from a writer of Toscanelli's erudition. Among other



Queen Isabella of Spain

things, the presumed writer states that his information came from a Chinese ambassador with whom he had conversed. But there was no Chinese envoy in Europe at the period. Moreover, he is made to call his country "Cathay," a term long since discarded in the East.

It is further claimed that, subsequent to 1474, Columbus corresponded with Toscanelli. Yet nowhere do the Florentine's papers contain any mention of the future discoverer.

At any rate, Columbus did not follow the route advised in the alleged letter, but dropped down to the 28th Parallel at the Canary Islands and ordered his sailing masters to follow it westward "700 or 750 leagues . . . at that distance land will be seen." Had Columbus held to this course, he would have landed in Florida, as did Ponce de Leon in 1513.

Besides the Toscanelli letter, the popular historians point to the Log Book of Columbus' voyage. This was edited, which is to say, altered, by de las Casas. We do not have the original. But in any event, the Log Book makes no mention of the great mission which de las Casas later alleged the king entrusted to Columbus. It repeats, almost daily,

that his objective is "Las Indias" (The Indies) — but to Spaniards that term meant the Antilles, not the East Indies. De las Casas himself, in his own work, employs the phrase solely in that sense. The governing body of the Spanish American colonies was the Consejo de Indias (The Council of the Indies).

It is quite true that *after* his first voyage, Columbus began to think that he had reached the East Indies and thereafter talked as if that had been his constant and sole aim. A point is made that in 1492 he carried letters to the potentate of Cipango (Japan).

But those letters, to which he attached little weight, were the price of his financing. When Columbus was turning away from Spain in discouragement, and was planning to carry his plea in person to England, the monks of La Rabida advised him to seek the support of the Spanish navigator, Martin Alonso Pinzon, who had influence at Court.

Pinzon had long championed the idea of reaching Asia by a voyage westward, and joined forces with

Columbus on the understanding that to the Genoese's objectives there be added those of Pinzon. It was Pinzon, not Columbus, who recruited sailors for the voyage, by painting the wealth of Cipango. Moreover, on October 6, when it became obvious that Columbus had failed to find his landfall in the Antilles, he acceded to Pinzon's urging and set a course for Cipango. Six days later, the ships arrived at San Salvador. Columbus then "recognized" the islet as part of the domains of the Great Khan, and very understandably appropriated Pinzon's idea as his own. But ironically, it was Columbus who had been right at the first, Pinzon who was wrong.

After all, there was more than intuition that told Columbus there was some land, other than Japan, west of the Azores. Although shadowed in doubt, the Americas were not entirely unknown.

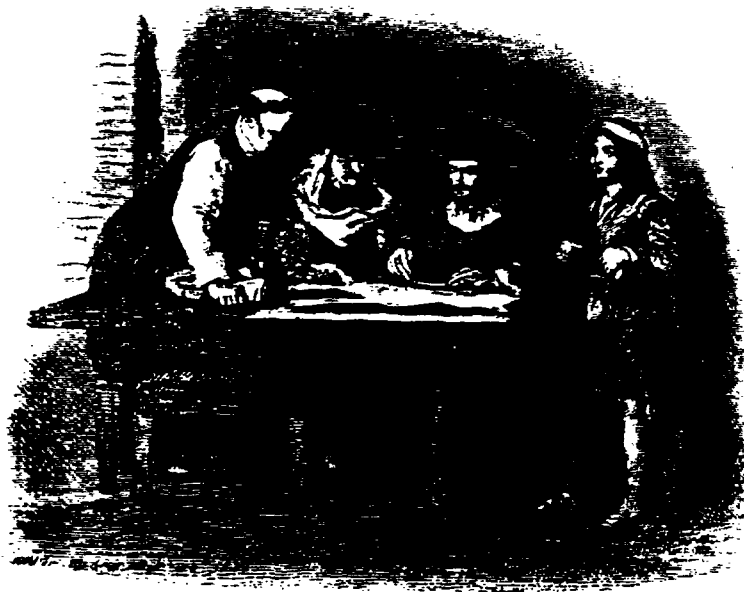
The inhabitants of the Azores had seen carved beams washed up on their shores, and bodies of strange red men. Ships had been blown against unknown western coasts, and

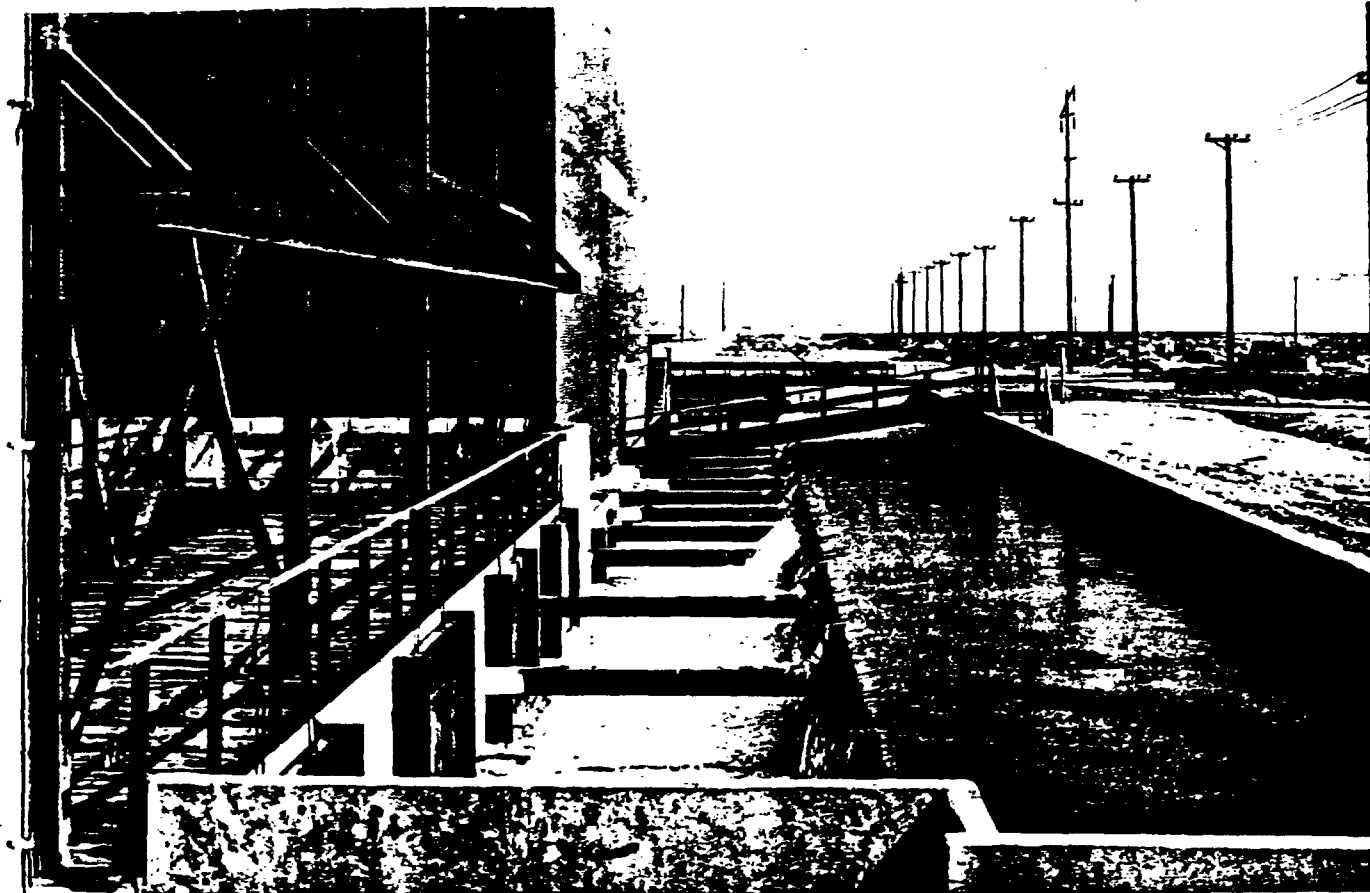
returned to Europe to tell the tale. The natives of Florida, it was learned by the first Spaniards to arrive in 1502, had already seen the "floating castles" of the white men. Basque fishermen had visited the Grand Banks, and doubtless the mouth of the Saint Lawrence as well, for a century prior to 1492. Five hundred years earlier, Eric the Red, his son, Lief, and various other Norsemen did their own voyaging to American shores. Interestingly enough, if as much time elapsed after Columbus' arrival in America as did between that voyage and those of the early Norsemen, people would still be cooling their heels for another half a century, before coming over here. Meanwhile, the job of accommodating *lebensraum* for 300 million people, who now call the Americas their home, would be slightly terrific.

Under the accepted notions of history, Columbus' champions did not foresee that they were thereby giving Toscanelli, not Columbus, credit for initiating the grand enterprise: that their latter-day version made the Florentine the brains, the Genoese the tool in the great project. Columbus is a greater figure knowing where he was going than one who made a monumental error of reckoning — and mistook the naked Arawaks of Santo Domingo for the wealthy and cultured subjects of the Great Khan.

But the verdicts of popular history are strong. People will always believe that the Pilgrims landed on that "stern and rock-bound coast," that our Revolutionary forefathers fought on Bunker Hill and not on Breed's Hill, that Lindbergh was the first man to fly the Atlantic, and not the sixty-sixth. And so they will continue to believe that Columbus, in discovering America, was looking for the Far East.

Columbus at the monastery of La Rabida, Spain, explaining his plan to sail westward from Europe





Twenty Gallons of Sea Water for Each Gallon of Gasoline

IT IS ONLY A LITTLE part of the whole story, but it is interesting, and as only one of the myriad problems that had to be overcome it may help to accentuate the success of the oil industry in producing ten times as much aviation gasoline as even oil experts thought possible, just five long years ago.

• • •

To start in the middle: It was November, 1940. The American Petroleum Institute was holding an annual convention in Chicago. Dr. Robert E. Wilson, now chairman of the board of Standard Oil Co. (Indiana), was at that time a petroleum

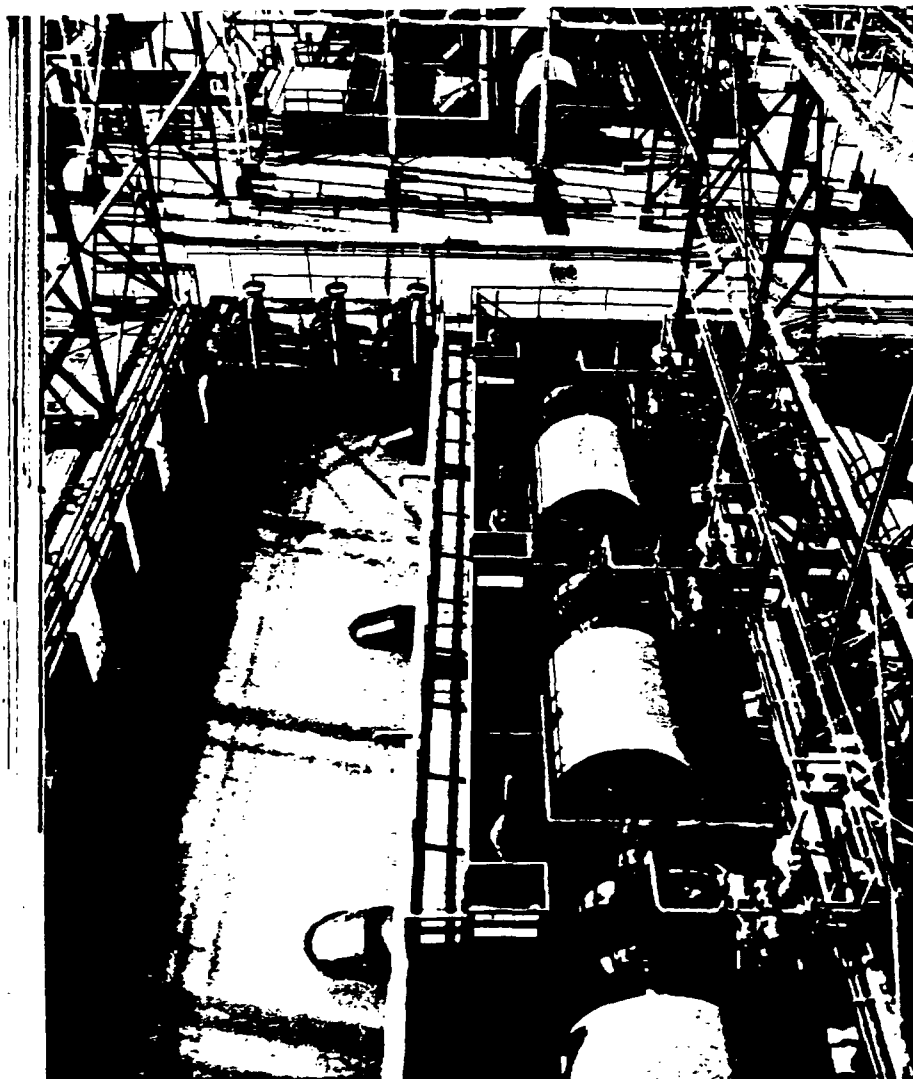
**One of a thousand stories behind the 1000%
increase in aviation gasoline production**

advisor to the National Defense Advisory Commission. He appeared at the convention with a call for 50,000 barrels of 100-octane gasoline a day from the oil industry. (Production at that time was about 38,000 barrels.) There was quite a stir following his talk. "Do you think we can do it?" "How?" "By God, we've got to." "If we shift this plant that way and ship this stuff there, etc." The next morning, around the halls of the Stevens Hotel, you heard reassuring comments that, "We'll make it all right."

About a year later the Japs threw their Sunday punch into Pearl Harbor.

But the petroleum industry "delivered the goods," and last March, just after the Ardennes offensive and the Battle of the Bulge, Secretary Ickes mentioned that the American Petroleum Industry was producing more than half a million barrels of 100-octane aviation gasoline a day. (Better than 525,000 b/d., much of which was better than 100-octane.)

Fifty thousand barrels and five



These pumps each gulp in 55,000 gallons of sea water a minute at the bromine extraction plant at Freeport, Texas

hundred and twenty-five thousand barrels are a little too far apart to be even in the same order of magnitude. You don't get one by stretching the other. You don't multiply anything by ten or eleven, by working a little harder, or improving a process, or renovating a plant.

When the full story of the aviation gasoline program is told it will take a book, a monument, an all-day movie, and a symphony orchestra to do it justice.

This is just a little part of the story. It's about $1/45$ of 1% of the total in volume—a matter of a couple

of hundred barrels a day of extract-of-sea-water, but in the total aviation gasoline program it was of substantial importance.

While oil men were talking seriously about fifty thousand barrels of aviation gasoline, they were talking about enough Ethyl fluid to give 3 cc. of tetraethyl lead per gallon. But when they went on to produce over five hundred thousand barrels a day, every gallon carried 4.6 cc. — 150% as much — tetraethyl lead. Along with the "lead" of course was ethylene dibromide, the other prime ingredient of Ethyl

aviation fluid, which is quite a rare chemical in normal times. So while demands for aviation gasoline increased about 1000%, demands for ethylene dibromide, to go into that gasoline, increased 1500%. Looking back it is a little surprising to notice that the rising demands were always filled promptly. Surprising it may be, but quite satisfying to the backward glances of those who produced the precious fluid.

• • •

Now let's start at the beginning, because the production record is impressive only when viewed in the light of the difficulties involved and the extensive preparation necessary to unlock the chemicals from sea water.

In the summer of 1924, General Motors' "Boss" Kettering and Tom Midgley went to Midland, Michigan, with H. G. M. Fischer of Standard Oil to see Dr. Herbert H. Dow about an assured supply of bromine for the "Ethyl anti-knock gas" just put on the market. Dow Chemical Company was then producing practically all of the bromine in this country from Michigan salt wells. Dr. Dow agreed that those brine wells would never supply the demand indicated, and also that the sea was probably the only adequate source. However, there was a reasonable doubt in the minds of some scientists that they could find a sea water extraction process that would be a commercial success because of the minute quantities present — only 67 parts of bromine in every million parts of sea water. The possibility was even discussed of constructing a pipe line to carry water from the Pacific across the Rockies to our western deserts, where concentrated brine might be produced by evaporation.

In the smoking car on the way

home. Tom Midgley turned to Mr. Fischer and said, "Why try for bromine as bromine?" What they really wanted was a bromide compound anyway, and a compound might be feasible to extract from sea water, even if the elemental bromine were impossible.

Made Their Own Sea Water

A month or so later, the Ethyl Corporation was formed. In the words of one of the original tetraethyl lead research men, T. A. Boyd: "We did not even wait to have water shipped in from the ocean to work on, but used instead a synthetic sea water made up in the laboratory." Dr. Graham Edgar suggested that bromine might be removed by reacting it with phenol; from this line of research, they finally wound up with an aniline compound, and produced tri-bromoaniline as a compound that could be extracted.

They were losing half of the bromine in a reaction with hydro-

gen, when James P. Andrew tried doubling the amount of chlorine theoretically needed, to mate with the troublesome hydrogen — and the problem was solved. Patents Number U. S. 1,662,305 (Graham Edgar) and U. S. 1,662,355 (James P. Andrew) were taken out to protect the aniline idea and the chlorine dosage.

They took this idea to the sea itself — and set up a semi-experimental "pilot plant" at Ocean City, Maryland. This was the winter of 1924. The pilot plant proved what the test tube had indicated — but also showed what difficulties would arise from foreign matter suspended in the water. The next plant they tried was a floating one when the Ethyl Corporation purchased a 4,200-ton cargo ship, the *Lake Harminia*, changed her name, and turned her over to the Bethlehem yards at Wilmington for conversion into a floating chemical factory. Ten weeks later, at the end of April 1925, she

put out to sea as the S.S. *Ethyl*. She had cost the infant corporation \$360,000. She made only one trip to sea, of seven days, and during that time her bromine plant was operated only six hours. Although the venture was not a commercial success, it did prove that bromine could be recovered from sea water.

The End of the Trail

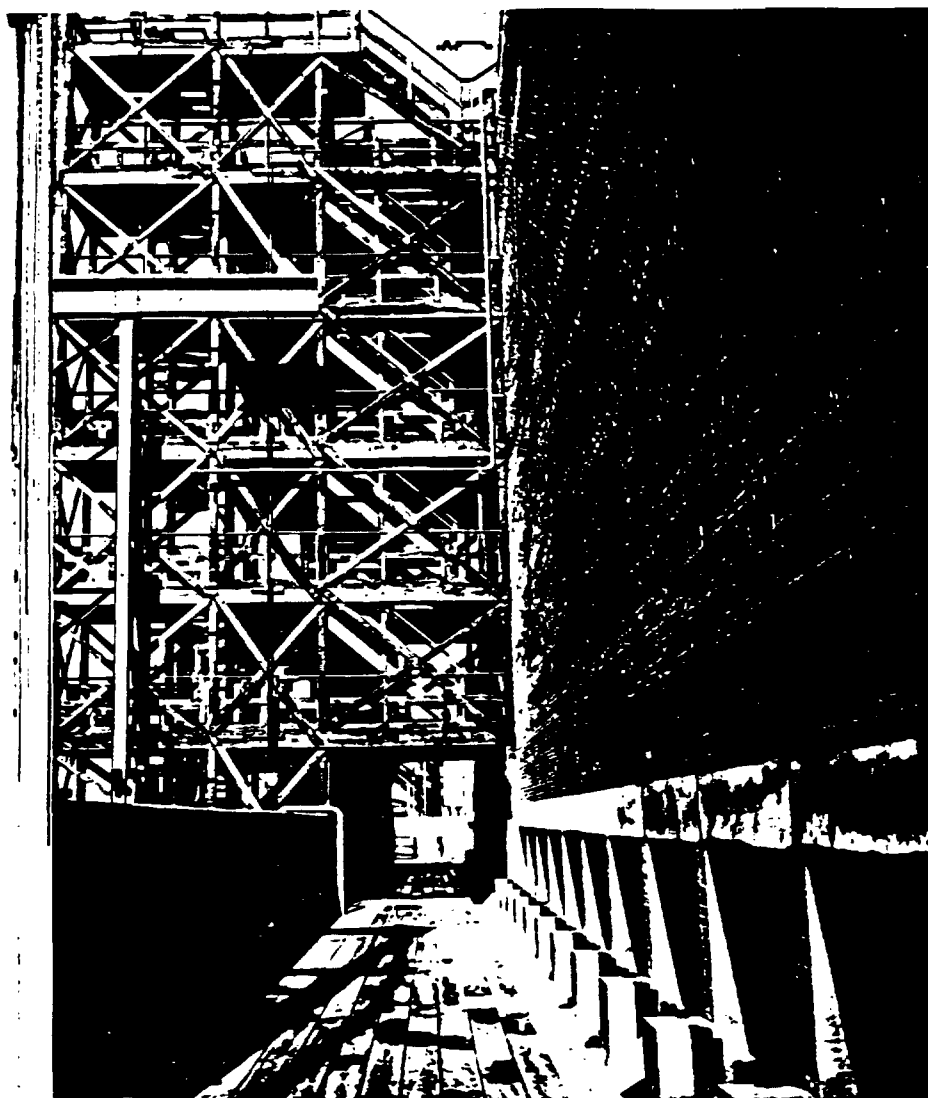
Meanwhile, the research chemists of Dow were following another trail — and the one that in the end proved better commercially. That idea was to build a plant on the shore to extract 40 to 50 of the 67 pounds of bromine that are present in each 1,000,000 pounds of sea water.

By the time "bugs" were worked out of the process and plans for the first sea water chemical plant at Kure Beach, N. C. (1933-34) were made, Ethyl and Dow had formed a separate company to handle the bromine extraction. The plant capacity

What look like houses, at one of the Ethyl-Dow sea water plants, are spray catchers which extract some last traces of bromine not previously recovered during the process of treatment



ETC 32196



It goes in here and comes out there. The sea water begins its process of treatment in this 84-inch pipe surrounded by scaffolding. In the tower at right are 112 streams of falling water from which the bromine is extracted

was set at 10,000,000 pounds of ethylene dibromide a year, and that looked tremendous. It meant pumping 40,000 gallons of water a minute. It meant producing ten times as much bromine as the entire country had produced in 1923.

Fortunately, with the rising consumption of gasoline in this country, and the increasing demand for Ethyl fluid for aviation gasoline for England, Ethyl-Dow started building a second sea water plant in Freeport, Texas, in 1940. Soon after it reached full production, the *daily* produc-

tion records of 100-octane gasoline were far eclipsing the *weekly* production records of 1940, so an addition to the Freeport plant was constructed. It went "on stream" just before the peak demand for aviation gasoline, in December 1944.

Taking bromine from the sea is an interesting chemical operation.

Pumps lift the brine to the extraction plant. After an acid treatment, chlorine is added. Liberated bromine, dissolved in the brine, is removed by forcing a blast of air upward through the tower while

the brine is flowing down. The bromine "mist" that then results is reduced to a concentrated solution of 80,000 parts per million. This bromine is combined with ethylene to form ethylene dibromide.

Ten years ago Ethyl-Dow's production of ethylene dibromide was 23,000 pounds a day. In 1939 it reached 59,000 pounds. In 1941 it climbed to 145,000 pounds. And this year it has touched 275,000 pounds a day, with 540,000,000 gallons of sea water being treated daily.

• • •

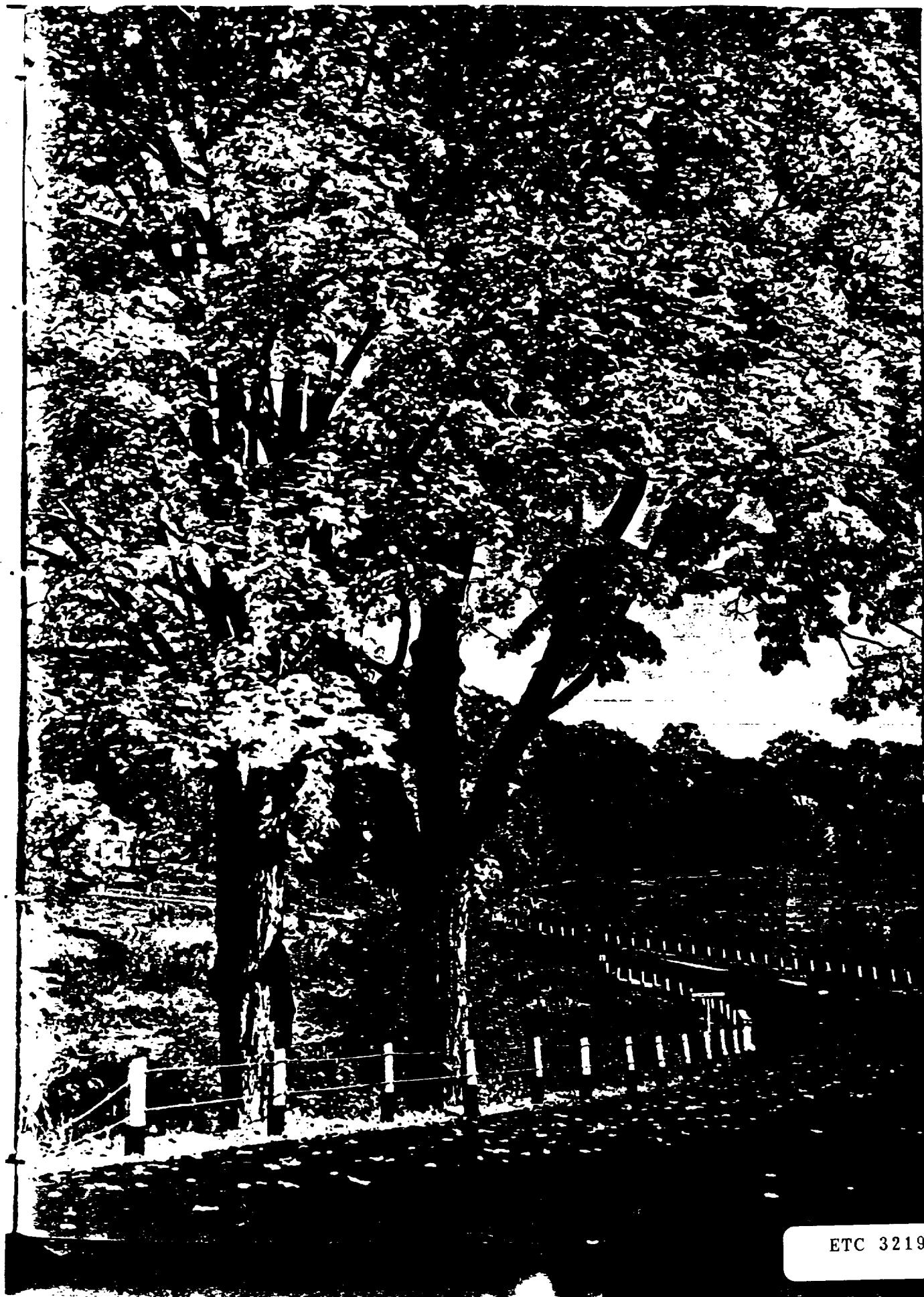
It's only one of a thousand stories that lie behind the aviation gasoline program, but it may help to show how amazing some of the others will be when they can be told.

OUR COVER

When Christopher Columbus landed on an island in the Caribbean four and a half centuries ago, it was indeed the dawning of a new day in civilization. Something of the meaning of his discovery is captured in this month's cover for the Ethyl News. The cover, which is a gouache, or tempera painting, was executed by Geraldine Linder.

OUR PICTURES

Page 8, courtesy Drake Museum, Titusville, Pa.; Page 9, courtesy American Airlines; Page 10, top, courtesy Pan American-Grace Airways, Inc.; Page 10, bottom, left, Acme Newspictures, Inc.; Page 10 bottom, right, Official U. S. Army Air Forces Photo through Acme Newspictures, Inc.; Page 11, top, courtesy Pan American-Grace Airways, Inc.; Page 11, bottom, courtesy Pan American World Airways; Page 12, Acme Newspictures, Inc.; Pages 16, 17, and 18, courtesy New York Public Library Picture Collection; Pages 19 through 22, courtesy Dow Chemical Co. Third cover, Philip Gendreau, N. Y.



ETC 32198

Ethyl comes back...

You've often missed Ethyl, haven't you?

*So have millions of other car owners
often missed the eager, responsive power
of America's finest gasoline.*

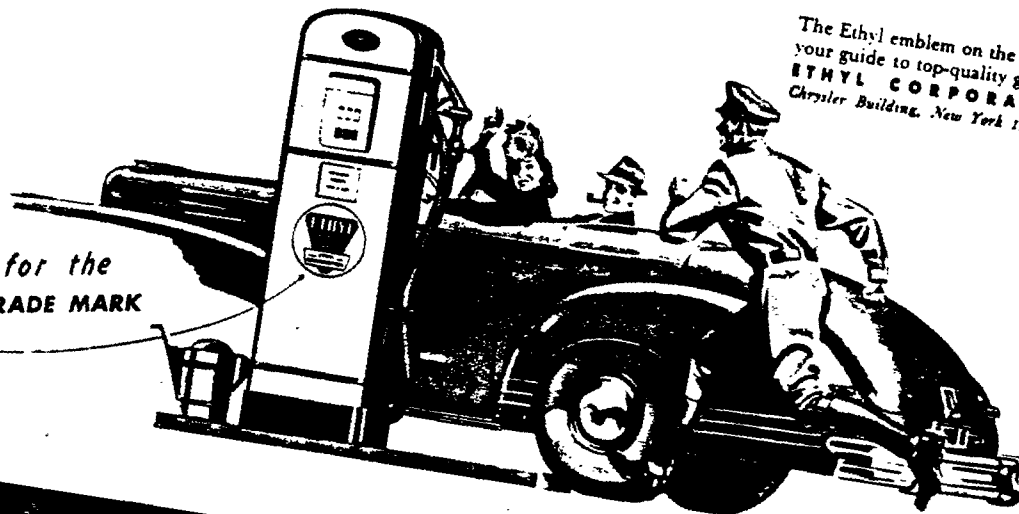
*Before long there will be a full supply
of top-quality Ethyl. You'll be able once
more to keep your tank filled with liquid
power that will bring out all the perform-
ance that was built into your engine.*

*Knocking and sluggishness
will be just wartime memories.*

*Yes—you're really going to enjoy driv-
ing again.*

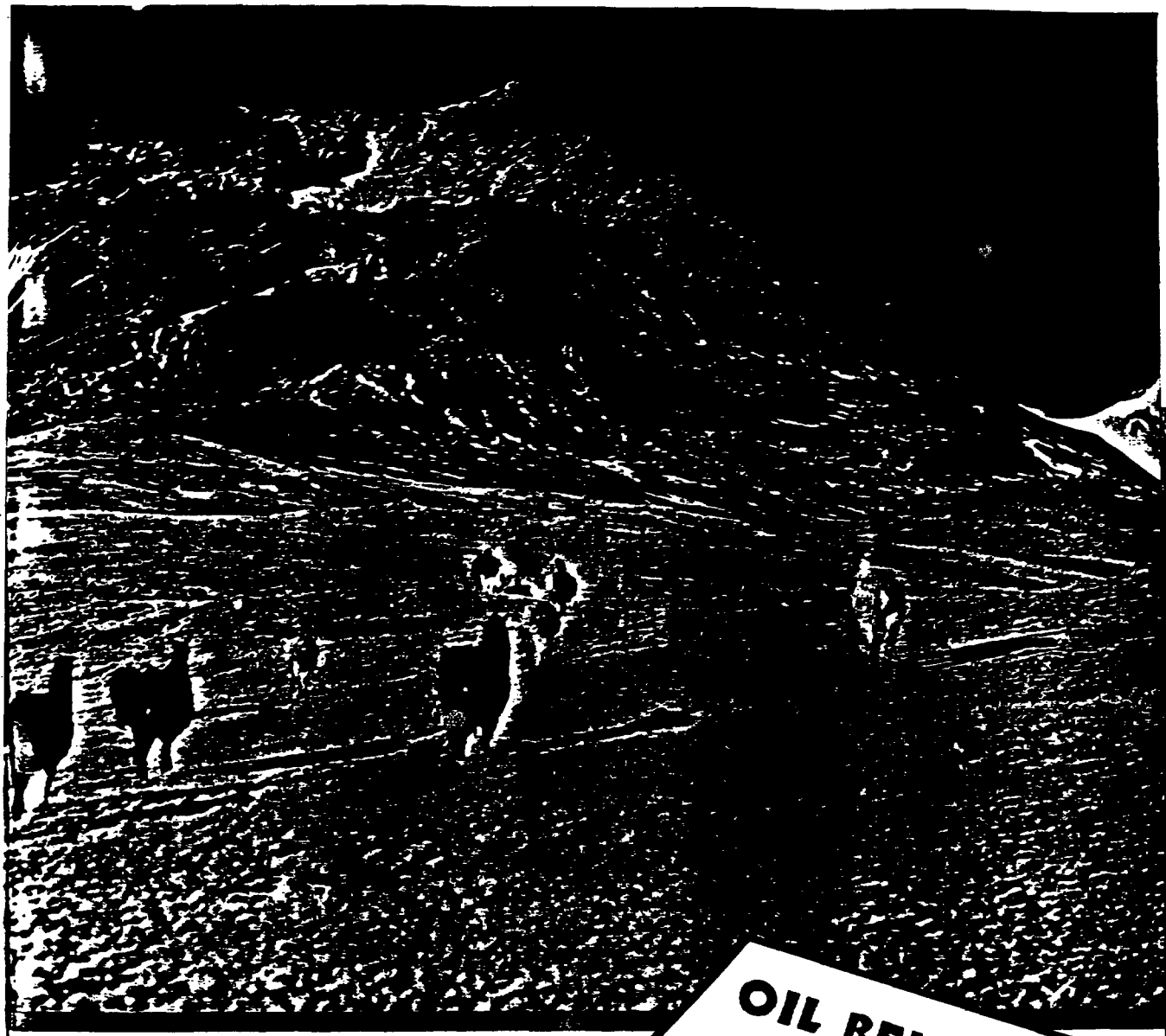


*Look for the
ETHYL TRADE MARK*



The Ethyl emblem on the pump is
your guide to top-quality gasoline.
ETHYL CORPORATION
Chrysler Building, New York 17, N. Y.

ETC 32199



**OIL BEHIND
THE ANDES**

PAGE 12

*ETHIOPIA
NEWS*

ETC 32200



Stanley T. Crossland has been appointed Comptroller of Ethyl Corporation, a new post in Ethyl's finance department which is headed by P. L. Griffiths, Vice President and Treasurer.

Mr. Crossland comes to Ethyl from the Reconstruction Finance Corporation. He joined the RFC thirteen years ago in Chicago and since 1940 has held several major positions with that Corporation in Washington. One of his first assignments in the nation's capital was to serve the RFC's Office of Rubber Reserve as Executive Director. He was one of the principals in the formation and operation of the Government's synthetic rubber program and he participated in the negotiations for the purchase and stockpiling of natural rubber.

In 1942 he organized the War Damage Corporation, formed for the purpose of providing war risk insurance, and served as its Vice President.

Meanwhile, Mr. Crossland also found time, during his tenure in Washington, to be a special assistant to the Board of Directors of the RFC.

A native of Illinois and a graduate of the University of Illinois, Mr. Crossland began his financial career as a bank examiner with the Chicago Clearing House Association. His office will be in New York.

IN THE

ETHYL NEWS

NOVEMBER, 1945

ROBERT V. KERLEY NAMED DIRECTOR OF ETHYL AERONAUTICAL RESEARCH 3

In a second step implementing the enlarged program of service of Ethyl's Detroit Research Laboratories, Robert V. Kerley has been placed in charge of its aeronautical research work. He succeeds S. D. Heron, who will continue with Ethyl as a special consultant.

MY NEIGHBORS' BOYS ARE COMING HOME 6

Will America's farm boys, serving with the forces, return to the farm — and stay? Here's a first-hand report by Stetson Clark, noted farm writer.

TUNE-UP FOR PROFIT 10

Helping motorists to get the most out of postwar gasolines is a job in which service stations can perform a real service — while building up a worthwhile business for themselves.

OIL BEHIND THE ANDES 12

South America may become a bigger oil producer than ever — if the towering Andes mountains can be conquered.

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THIS IS OUR LAND 16

What soil conservation means to America's farmers — and their future — is vividly portrayed in a new film produced by Ethyl. The film has won the plaudits of the U. S. Department of Agriculture.

THESE WERE THE FIRSTS 19

Long before it came into its own in modern times, petroleum was put to many strange and fascinating uses.

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

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

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

Earle W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzalez, secretary

ETC 32201

ROBERT V. KERLEY NAMED DIRECTOR OF ETHYL AERONAUTICAL RESEARCH

Succeeds S. D. Heron, who will continue with
the Corporation as a special consultant

ROBERT V. KERLEY, who has been a civilian engineer with the U. S. Army Air Forces at Wright Field for the past thirteen years, has been appointed Director of Aeronautical Research for Ethyl Corporation. He succeeds S. D. Heron who is retiring from active supervision of the work of the department but will remain with the Corporation as a Special Consultant.

Appointment of Mr. Kerley is another step forward in Ethyl's research program to effect the maximum degree of service, coordination and cooperation with oil companies and manufacturers of engines and engine parts in the proper utilization of automotive and aircraft fuels.

A native of Helix, Oregon, and a graduate of Oregon State College with a B.S. degree in mechanical engineering in 1931, Mr. Kerley joined the Engineering Division of the U.S. Army Air Forces at Wright Field, Ohio, in November, 1932. He began as a test engineer on aircraft engines and later became project engineer specializing on Pratt and Whitney engines. In May, 1936, he was assigned to the Fuel and Oil Branch of the Power Plant Laboratory of the Engineering Division, and three months later was named chief of that branch. In this position he succeeded Captain Frank Klein, who was assigned to foreign duty and

who previously had succeeded S. D. Heron when he resigned that post in 1934 to head Ethyl's aeronautical activities.

During his service with the Fuel and Oil Branch, Mr. Kerley was a member of the National Advisory Committee for Aeronautics Subcommittee on Fuels and Lubricants. He also served for two years as chairman of the Southern Ohio Section of the Society of Automotive Engineers.

Having been at Wright Field during what was unquestionably a most significant period of aeronautical progress — beginning with the Martin B-10 bomber, which flew on 91-octane gasoline, up to the advent of the B-29, operating on Grade 100/130 fuel — Mr. Kerley brings to Ethyl's Aeronautical Research Department the experience of a close association with current developments in the utilization of fuels for aviation engines.

For nearly a decade, he has been closely identified with the standardization of specifications for aviation grade gasolines, which work began in the spring of 1936 when the specifications for 100-octane gasoline were first adopted. This work required constant surveillance over the test procedures employed for refinery and experimental testing to assure consistent correlation with



aircraft engine test results. This was particularly essential when fuels rating 100/130 and 115/145 performance numbers were evolved during the war. In addition to this work, he devoted much time and study to the development of cooling liquids, corrosion preventive compounds, lubricants, fuels and knock indicators. In all of this program of research, he was closely associated with aircraft engine manufacturers and refiners of aviation grade fuels.

Last February, Mr. Kerley was sent to the China-Burma-India theatre to aid in setting up quality con-



trol of petroleum products. While taking off one morning from Casablanca, his plane crashed and burst into flames. Thirteen of the 30 persons aboard were killed. Mr. Kerley suffered second-degree burns and other injuries, and was hospitalized for three weeks.

In his new work as Director of Ethyl's Aeronautical Research Laboratories, Mr. Kerley is planning an increase in cooperative work with the manufacturers and users of aircraft engines and with the petroleum industry.

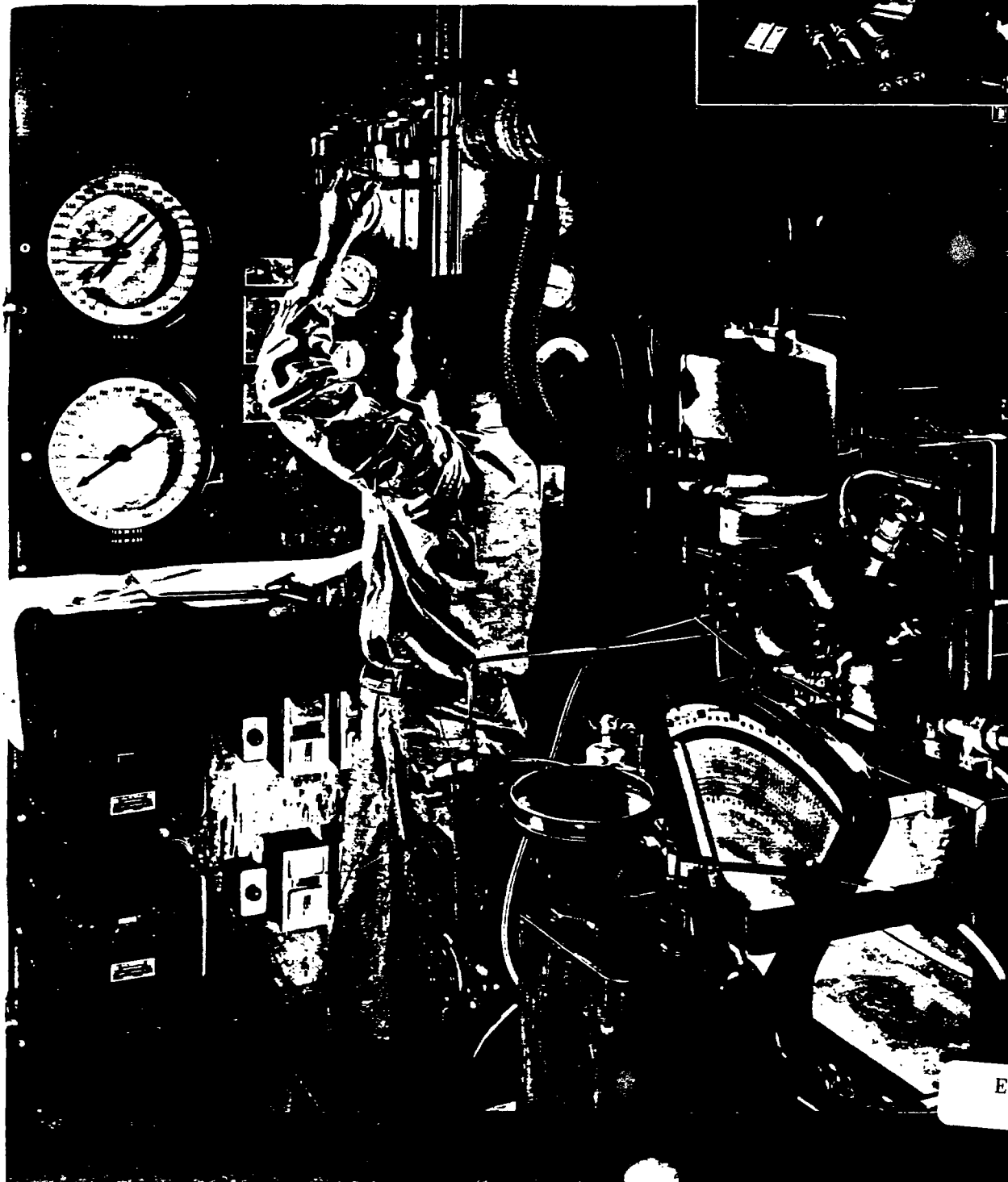
Mr. Heron, who was born in England, first came with Ethyl in 1927 on a temporary assignment but returned later to the U. S. Army Air Forces, serving at Wright Field in the position filled for the past nine years by Mr. Kerley.

He has directed Ethyl's researches into the aeronautical applications of constantly improved fuels, and made many contributions to technological progress in this field. During the war, he cooperated with the Army Air Forces in the solution of many problems that arose with the development of 100-plus aviation grades of gasoline. Under the new organizational plan of the Aeronautical Research Department, Mr. Heron will be able to devote more time to specialized research problems. As in the past, his services will continue to be available both to Ethyl and to the aircraft and petroleum industries in helping to solve some of the problems which lie ahead in the expanding fields of aircraft fuels and aeronautical research.

This apparatus is used for the testing of the strength and corrosion resistance of materials at high temperature over long periods of time

Special parts needed for test which cannot be readily procured are made in the laboratory. Pictured is the induction silver brazing of aviation spark plug ground electrodes

Engine for testing aircraft fuels and spark plugs under extremely severe conditions



ETC 32204

My Neighbors' Boys are Coming Home

By Stetson Clark

**Here's a first-hand report on a big postwar question:
Will U. S. farm boys, now veterans, return to the farm?**

CLINT WOHLBACH's eleven-year-old boy looked like a human fly perched between the wheels of the big Farmall tractor. Clint didn't exactly approve.

"Oh, he can run it. But that's a big piece of machinery," Clint said. "A boy that age doesn't have judgment, you know."

The lad was pulling a load of manure out of a neighbor's barnyard, and wheeled away with it as we watched him. Clint was obviously more than a little pleased, but a lot worried.

Farm boys and tractors are hard to keep apart in this neighborhood. Parents are glad their boys take so naturally to power farming. But they also worry some about their older boys, as well as their tractor-wise eleven-year-olds. And what worries them there is whether their soldier sons will come back to the farm — and stay.

Some of these boys are back already. When they start to look around the place one of the first things a lot of them want to do is to see whether the old tractor still percolates. And they have their heads full of the new kinds of equipment they think their dads should get, when it is available. The war has taught their parents that modern farm machinery can do things — more than they thought it could. But they know that every piece of it has to pay its way, and that power farming calls for good judgment just as the other kind did.

Will things be better? Will the boys now in uniform get into wash-faded blue overalls, neatly folded and awaiting their return in bureau drawers, pitch in, and like it? How

will they make out? Will they stick to the farm?

Cal Kunsman put it this way the other day. "The boys want to do everything with a tractor," he said. He was talking about getting rid of his horses entirely. I could tell by the tone of his voice that he half wished his boys didn't think that way.

One of the boys has just got out

of the service and is now back on the farm. It's a little hard for Cal to make up his mind to an order of farming in which there isn't a horse on the place. Nevertheless, the horses will go if Bill, the boy who is just back from four years of fighting, and Bob, who is still in the service, and four other Kunsman boys have their say.

Cal's reluctance to part with the

John Melchor, Jr. is typical of the Pennsylvania farm boys who are serving with the armed forces



horses isn't just a matter of sentiment. He would like to see one of his sons carry on the place where they are now living, and he'd also like to give each one of them as good a start as he can in a vocation which has agreed with the Kunsmans, here in this part of Pennsylvania, for some 200 years. At first he lived on a smaller farm. Now he owns this larger one. Many a Kunsman before him has added to his acres. But all have left something more than acres,



Jim Kunsman shows his brother Bill their new milking machine. Left, eleven-year-old Harry Wohlbach can drive a tractor



and stock and tools to their sons. They have also left a homespun lore and wisdom, and a set of rules that applied to farming not only as a vocation but as a way of life.

The Linford Nicholases who live on the other side of Stoudt's Valley have two sons in the service. They sell their milk to a co-operative. The barnyards of the co-operative farmers are spic and span. They have to be. According to its day, the Nicholas barnyard has always been so. The place has been in Linford's family, going back on his mother's side, five generations. Will one or

the other of the two Nicholas boys want to carry on the Nicholas homestead when he gets back? If so, how will he make out? Merle, the younger of the boys, definitely has other plans.

Merle was just out of high school when he was inducted. He liked to tinker with the tractor, and drive it too. But he has had special training in radio engineering in the service, and his father thinks he might like to set up for himself as an electrical repair man. As he sees it, there will be home freezing units and a lot of other electrical equipment to

be looked after, in time to come.

I asked Linford whether he thought farming would appeal to Carl, his older boy.

"Well, I don't know," the father replied. "The trouble is, my boys remember too well the depression years. We don't have any family secrets, and they knew just what I was getting for things.

"Then the war came along. Carl got a job in a nearby war plant running a lathe. He swung right into it as most farm boys do these days with any job connected with machinery. Hours were from seven to three, and he could still help me after he got home nights. Then his job got to be seven days a week, time-and-half for Saturdays and double-time Sundays. And presently, he was drafted."

But before Carl sailed, as a lot of other boys have done in this war, he got married. And he married a farm girl. Will they decide to live in town when Carl gets back? His father says Carl was well liked at the industrial plant, but he isn't certain just what he will want to do.

"The war has taught us things," Linford Nicholas said, "about getting more work out of a tractor. We'd learned a lot before that. But the war taught us a little more. This power farming, as they call it — and automobiles are a part of it, too — fits right in with other developments that have come along.

"Same way with corn. We use more fertilizer, and this hybrid corn grows faster than the other did. This helps us to keep ahead of the weeds, and fast tractor cultivating helps still more.

"If Carl's got it in the back of his head, though," Linford said, "that he'd really like that job back, I'd like to see him get it back. Because I wouldn't want him to start out here on the farm wishing he was running a lathe instead. I'd rather see him work it the other way; take back his job at the plant if he'd rather. He could still live with us and help me out if he wants to. Then if he decides farming is the life he wants, he'll know what he's doing. There's one thing about farming. You've got to make up your mind to stick to it once you get into it."

Carl Kunsman's oldest boy, Stanley, right now is further along toward becoming a farmer in his own right than any of the other Kunsman boys.

When Stanley was a small boy he lost one of his legs in a horse-and-wagon accident. So he was never a prospect for a uniform. Stanley got himself an industrial job long before the war, and he is now buying from his father the 30-acre farm that the family lived on for a time before moving to their present place. Likewise, he's paying up for a two-plow tractor and a combine, which is quite an investment in machinery for a place of that size. Stanley, though, doesn't think for a minute that his place is always going to be

that size. At present he is keeping his land in oats, wheat, corn and alfalfa, and with the big tractor can handle plowing and harvesting operations nights easily enough after work and over week-ends. Recently he increased the size of his dairy herd to eight. Also, he has 200 chickens.

I have talked with a few of the independent farmers in another locality — around Bath and Nazareth way — just to see how the outlook checks with that in my own neighborhood.

On one of the farms, only one of the boys brought up on it looks like a farmer for keeps. But on two others there are three boys now in the service who will want to get back into farming, and on another farm there's a boy who has been carrying it on while his brothers were away, and who also plans to continue farming after the war.

For instance, Floyd Gradwohl's two sons, Ray and Walter, who worked at the Bethlehem Steel Company before the war and helped out in their spare time, are certain to come back to the farm, and may want to pitch in and become full-time farmers as soon as they can. Neither looks forward to being merely a wage earner for the rest of his days. There'll be jobs for them on the farm full-time or part-time, either way, when they get back.

If present family plans are carried out on the Leidig Vogel place, Sgt. Charles Vogel, now in Japan, will take over when he gets back. Charles, married and in his thirties, is an example of at least one farm boy who went to town, and after taking plenty of time has decided he likes farming better. For a number of years prior to his enlistment he worked at his trade as a welder, then got closer to farming as a miller at the Farm Bureau Co-operative feed

mill at Tatamy, and now he wants to be a farmer altogether.

The Vogel farm fattens some 30 head of steers each winter, and is now being operated by Francis, who is looking around for another place. The youngest, Paul, who went into the service from high school, thinks he'd like to be a fisherman when he gets out — like one of his buddies in the Marines who was reared on the Maryland eastern shore. Captain Roy Vogel, who worked as a machinist before the war, thinks he would like to stay in the army. Shelton is a carpenter, and is one of those who don't talk much.

One of the county's larger potato growers with whom I talked, former State Representative John Jones, has four boys of whom one is in the service, two are in business, and only one has chosen farming as his vocation. Yet John Jones in his own life is an outstanding example of how profitable farming can now be. The boy in the service, Col. Harold L. Jones, has been a "bug" on airplanes since his high school days. He wants to stay in the Air Corps if he can.

When John Jones started in he had 13 acres, some chickens and an orchard, and was known in Bath as "Jones, the egg man." During these war years he had to leave his chicken houses empty, because he just couldn't get the help. A hail storm destroyed his apple crop. Yet he will get a fair yield from 60 acres of potatoes, 70 acres of alfalfa, and 50 acres of wheat. The Jones farm now comprises 200 acres, is equipped with three tractors, two potato diggers, a pick-up bailer, two dump trucks, and graders for sorting the potatoes, among other items. It also has enough storage capacity to store the entire crop.

Of all the boys I am acquainted with in my own neighborhood, there's just one I'd bet my bottom

dollar will return to the farm when he gets back. And stay there. That's "Junior" Melchor, son of John Melchor.

The Melchors have two tractors, or will have as soon as the one that was ordered last winter arrives. They also have a half interest with the Hindernachs in a pick-up bailer, a share arrangement with another neighbor in a corn picker, a feed grinder, an ensilage cutter, and so on; also a plant for pasteurizing and processing milk. Farming doesn't require the long hours and hard work that it did when "Junior's" grandfather was getting the "Bach Echo" milk route established in five-miles-distant Easton. Nevertheless it requires plenty of application, plenty of understanding, and also plenty of judgment.

I know from observation that "Junior" has plenty of application. He was 18, and had just entered the course in dairy husbandry at Pennsylvania State College when he was inducted into the service. "Junior" took to college like a Muscovy duck to a tender young frog. It was his dish. Just the other day his family got a letter from the college dean, urging them to see to it that "Junior" finishes up college after he gets back from the army. But it will probably

be another two years by the time he gets out of the service. And his mother is wondering if he will. They hope he will.

Lester Race is another boy I know personally. His father, who has a 27-acre truck farm, doesn't think for a minute Lester will ever come back to the farm. He is in the Navy now and is following a course that will qualify him as an aviation mechanic when he gets out. His father thinks he will want to follow that line. But Lester has worked for me some and I think I know him pretty well. And I wonder if he won't decide some day that he would be happier living on a farm than working at a trade. Incidentally, his father, Floyd Race, who had a perfectly good job as a timekeeper in a war plant during World War I, decided to become a farmer when that war ended, rather than look around for another one like it.

Floyd is biding his time and will get along with his old tractor and a pair of horses up until such time as the new tractor he wants comes along. Then the horses will go, and the old tractor will meet its overdue appointment with the junk man.

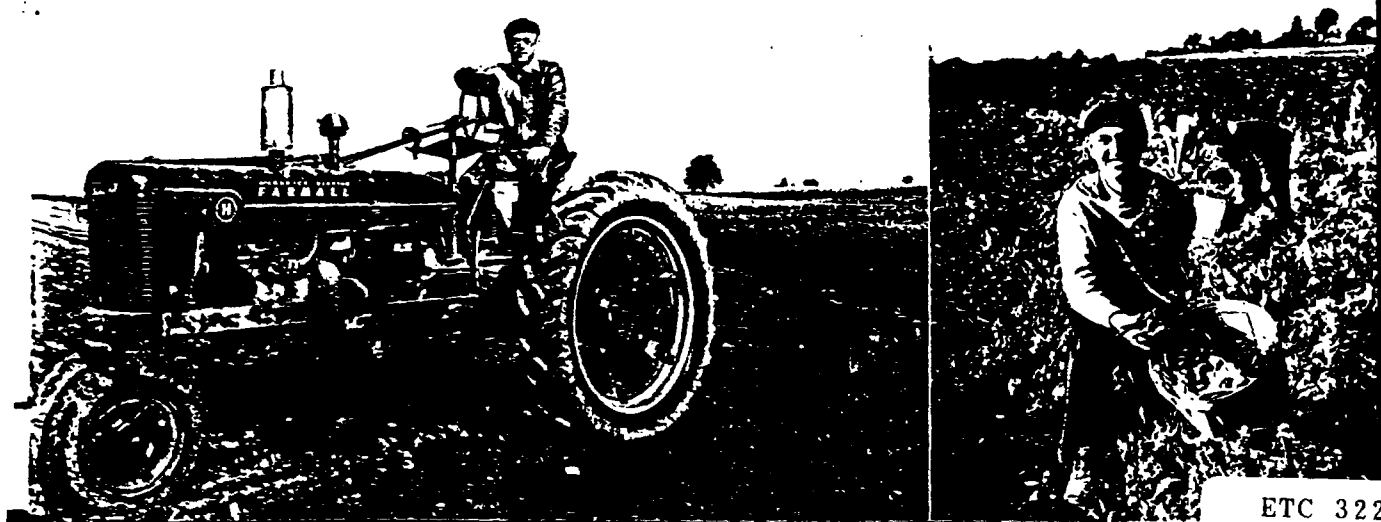
But I'm just talking about farmers' sons in my own neighborhood. If you want a national picture of farm

boys in the service — and an idea of their plans and intentions — here are some authoritative reports:

An occupational survey made by the army indicated that some 800,000 of our boys now in uniform intend to follow farming as full-time vocations when they return to civilian life. This is about the normal expectancy. Incidentally 1,200,000 others said they would like to work at an industrial job and farm on the side. This is above the normal expectancy. Add to this a statement by former Secretary of Agriculture Wickard, while he was still in office, that independent farmers are now more than holding their own, and you have the picture. We'll have plenty of farmers after this war — perhaps more of one kind or another than we have ever had.

With better machinery and more of it, with new insecticides, better seed and improved breeding practices, they'll go places. Former majors and colonels and aviation mechanics will be among their ranks. Boys who have done well in a course in dairy husbandry will be among the leading dairymen. Any of them could keep 30 acres or so in grain and forage crops and work in an industrial job on the side if that appeals to them.

Linford Nicholas and Floyd Race are typical of the farmers who wonder whether their sons in the service will come back to the farm — and stay



ETC 32208

Tune-Up for Profit

Service stations can build up a worthwhile business by helping motorists to get the most out of postwar fuels

BEFORE THE WAR, tune-up business was of minor importance to the average service station.

With gasoline gallonage far and away the biggest single source of revenue, followed by sales of lubricants, motor oil, and tire-battery-accessory items, the average gasoline dealer did not pay much attention to tune-up service as a steady income producer. Although some stations did develop a substantial sideline in this work, tune-up for the typical dealer was little more than a courtesy service for his customers — something performed with a wrench and a screw driver.

But then during the war many dealers of necessity were forced into the tune-up business. This developed as gasoline rationing sharply curtailed their sales at the pump, and as motorists at the same time realized the importance of regular maintenance for their cars. Motorists turned to their neighborhood gasoline dealers for this service, frequently because it was unobtainable elsewhere, due to the shortage of trained mechanics. But curiously

enough, although many dealers looked upon tune-up as a temporary wartime sideline, thousands of them soon discovered that it was a profitable source of income which could, and should, carry over into the present era.

And so now, with the return of normal conditions, and as part of the growing trend toward increased diversification of sales, tune-up promises to be of greater importance than ever before.

It is doubtful whether many dealers realize just how large a demand for tune-up there is.

Virtually every pre-war car on the road is in need of a tune-up — particularly if it is to get the most out of the vastly improved postwar gasolines. This is imperative if the cars in operation are to capitalize, to the fullest, on the added power, better performance and greater fuel economy built into every gallon of today's superior motor fuels.

Accordingly, the gasoline dealer can perform a twofold function. He can supply his customers with a service vitally needed at this time. And

he can develop a business that is good business, repeat business, one that can be adjusted to the facilities of a station, one that is a profitable source of revenue.

This is borne out by actual experience.

Surveys taken before the war indicated that, among dealers offering that service, tune-up was not simply a profitable source of revenue in itself; it also contributed to the sale of a host of other products and services. Selling tune-up, it was found, increased the sale of TBA items, encouraged motorists to buy high-quality fuel, enabled a station operator to attract the business of small fleet operators — and helped him to take care of all of his customers' requirements at his place of business.

Even in those pre-war days, the need for systematic tune-up was becoming increasingly apparent. This was evident from the fact that modern high-compression engines — while more efficient, powerful and economical — are also more sensitive to maladjustments and defects. Increased road speeds and the greater electrical load placed upon cars (from heaters, radios, etc.) were other contributing factors.

Another important reason was increased vehicle age. It has long been recognized that the older a car, the more it requires regular tune-up tests and maintenance. If this was true back in 1940, when cars on the average were four years old, it is obviously of much greater significance today, when cars on the road are on the average seven-and-a-half years old. These cars must be kept in operation for an indefinite time to come. Helping motorists to do that — through tune-up — is a job in

Tune-up service is not simply profitable in itself, but stimulates supplementary sales



which the service station operator can perform a real service, while enhancing his own business.

But the biggest reason of all is of crowning importance today: the vastly improved quality of postwar motor fuels.

Today, the gasoline dealer has in his tanks branded products that are even better than corresponding pre-war gasolines. Oil companies are advertising the fact, and justly so, that the wartime advances in petroleum technology are now available to motorists — at their neighborhood service stations. But obviously, the motorist will not derive all of the added driving pleasure to be gained, unless his car is adjusted to take full advantage of these postwar fuels. Clearly, then, the gasoline dealer has a very real interest in having his customers' cars tuned up for the superior grades of motor fuel now on sale.

For service station operators considering the addition of tune-up service to their lines, one point should be made clear: A complete tune-up job should be done on a car or none at all. Experience has proved that when steps are omitted from a tune-up, the cause of the trouble is frequently missed; indeed, a partial tune-up can sometimes make a car run worse than before, and the result is a dissatisfied customer.

This does not mean that a dealer must handle all repairs and adjustments himself, in order to serve his customers adequately. But it does mean that he should recommend a complete tune-up job, even though some items of it must perforce be done elsewhere.

The best practice, it has been found, is for a dealer to take care of ignition and minor carburetion work at his station, but to have major repairs performed by shops equipped to handle this work. Even in ignition and carburetion work, it is some-



Tune-up helps a dealer to handle all of his customers' needs at his own place of business

times more practical to have generator, starter, distributor and carburetor overhauls performed by outside specialists. Yet, no matter how the job is handled, encouraging motorists to have complete tune-ups performed will pay off handsomely in customer satisfaction.

Whether a station is adaptable to tune-up service depends, of course, upon its size, whether it has enclosed service facilities, and so on. Tune-up, too, requires the services of adequately trained personnel, able to devote ample time to this work without interfering with the sale of petroleum products, the prime function of the service station.

For a completely equipped shop, the following tune-up equipment is indicated:

COMPRESSION GAUGE
LOW READING VOLTMETER
VACUUM GAUGE (COMBINED WITH FUEL PUMP PRESSURE GAUGE)
TIMING LIGHT
EXHAUST GAS ANALYZER
ANIMETER-VOLTMETER COMBINATION (AVR)
COIL TESTER
CONDENSER TESTER
DISTRIBUTOR DRIVE
ELECTRIC TACHOMETER
SMALL TOOLS, CARBURETOR TOOLS, ETC.

This represents an investment of between \$400 and \$600. A start can

be made by purchasing only the first four items listed, plus a set of small tools. This latter group costs in the neighborhood of \$60, and with good training a mechanic can do an adequate job with this equipment. However, as the business develops, the additional equipment should be added.

The most modern development in tune-up work is the chassis dynamometer, on which a car can be operated in gear under load conditions. Besides saving the time of road testing, the dynamometer duplicates road conditions, reveals engine defects that appear only under load, and accurately establishes the setting of the spark in an engine for maximum power. Although its cost is relatively high, its use may be justified in the larger stations. Before the war, a number of service stations put chassis dynamometers to good use, thereby building up a good tune-up business.

To the extent that gasoline dealers offer tune-up services to their customers, they will be performing a real service in keeping pre-war cars going, will help them to get the most out of the improved postwar gasolines, and will be building a worthwhile business for themselves.

OIL BEHIND THE ANDES

by John P. O'Donnell

It is a curious fact that, after rounding the tip of South America in the sub-antarctic spring of 1520, Ferdinand Magellan set off in a direct northwesterly course across the broad expanse of the Pacific. It is curious because the first objective of his voyage was to explore the continent beyond the Portuguese domain and then sail for the Moluccas.

Two reasons may have contributed to his decision to abandon further exploration of South America and to ignore the west coast of the continent entirely. He had wintered in Patagonia, and when he resumed his voyage in October, 1520, only three of his original five vessels remained. One of the two had been lost and the second deserted. So it may have been that he then struck out for the Moluccas to shorten what had already been a near-disastrous voyage. If so, it was into greater disaster, for Magellan himself lost his life in the Philippines, and only one of the original five ships was to make its way back to Portugal.

The second reason that may have discouraged Magellan from further exploration of the continent was the forbidding aspect of the region into which he sailed. The straits which

As much oil as South America has yielded, much more remains to be produced—if the Andes can be conquered

now bear his name are bounded by some of the world's most desolate shore-lines. Mountains rise abruptly from the sea; it is a bleak region, cold and abounding in fog. Magellan and his men must have regarded it as uninhabitable—a region that man would never conquer and one that would be of no value to his sovereign.

If this was Magellan's estimate of the new land, it was not without substance in part.

Today, more than 400 years later, man has still not conquered that land. The mountains which he saw were the southern extremities of the Andes, the greatest mountain range in the world. They extend from the islands of Tierra del Fuego in the south up to Venezuela's Caribbean coast, a distance of 4,500 miles. More than a score of the greater peaks of the range tower close to or more than four miles above sea level. There are relatively few passes through this formidable barrier, particularly west of Brazil where the continent is its thickest. Because of this inaccessibility, the Andes region has, with few exceptions, defied man's attempts to exploit it.

In doing so it has denied the world access to one of its greatest treasure

troves of minerals. The greatest known wealth of copper, one of the most useful of metals, is found in the Andes. Platinum, gold and silver are also to be found, as are less precious but commercially valuable minerals such as tin, bismuth, mercury, borax and sulphur. Deposits of very rare vanadium are present. And there is, also, petroleum.

Evidences of the presence of petroleum are found the full length of the Andes, giving foundation to the belief that some of the world's major deposits may be located there.

But the forbidding aspect of the towering, snow-clad mountains which may have discouraged Magellan has certainly discouraged exploration for oil. Indications of oil-bearing formations are abundant from Venezuela to Tierra del Fuego, but only in a few instances have they been explored. Yet this limited exploration has uncovered producing oil fields from central Argentina to northern Venezuela. It is not improbable that discoveries yet to be made in the intervening areas will multiply many times the total amount of oil that has been found so far.

Chile, almost 3,000 miles long and less than one-tenth as wide, is hope-

fully testing for petroleum within its odd-shaped boundaries. This is interesting because the section of the country having what are regarded as its best oil possibilities is Tierra del Fuego—the same islands through which Magellan sailed more than four centuries ago in his trip around the world.

The Chilean Government engaged an American firm to explore these possibilities, and locations were made for a number of test wells. From this area of exploration on the very southern tip of the continent, areas of present or potential production stretch all the way north to the Caribbean.

Most southerly of the known oil producing fields behind the Andes are the Nequen and Mendoza fields of Argentina. These fields have been in operation for years and contribute measurably to making Argentina the leading oil producing country in the western hemisphere south of the equator. The Mendoza fields are near a city of that name, the center of the Argentine wine industry, which incidentally took a cue from the oil industry to increase its efficiency. That is, it built the world's only pipe line for wine.

Years ago, there was minor commercial production on the Peruvian side of 12,500-foot-high Lake Titicaca, the world's highest navigable body of water and the continent's largest fresh water lake. Peru has been an oil producing country for 60 years. In fact, its petroleum products were used centuries ago by the early explorers who beached their ships in Pacific coves to calk the seams with pitch from the La Brea pits.

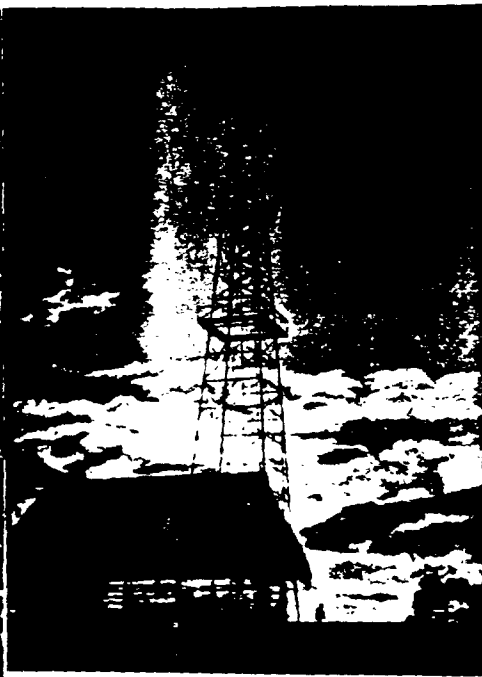
Peru has a flourishing oil producing area on the Pacific but its future greatness as an oil country, if it comes, will result from discoveries beyond the Andes. The government has recognized this possibility and



The Mendoza field, in the foothills of the Andes, is one of the four oil producing regions of Argentina

Lake Maracaibo, the largest single source of oil in South America, itself is in the region of the Andes





A well in Peru, only South American country with large west coast crude production

has proved to realize it, first by undertaking wildcat drilling itself in the Montana, the vast area east of the Andes, and second, by making exploration and exploitation taxes much lower in that region.

Peru's Montana has seen one of the most daring pieces of oil exploration on record.

A plane passenger flying high above the mountains detected a favorable looking structure, came on to the United States to organize the Gansu Azul (Blue Goose) Petroleum Co., Ltd., and returned to Peru to find that country's first production east of the Andes. Several successful wells were drilled after stupendous difficulties had been surmounted. Drilling equipment could not be taken over the mountains, though the site was only a few hundred miles from the port of Callao. Accordingly, it was brought in by way of the Amazon and its tributaries, the Solimoes, Ucayali and Pachitea, a distance of some 3,000 miles. Eventually, sufficient production was developed to warrant the con-

struction of a small refinery, but it has not been fully developed because the oil could not be taken out.

The difficulties surrounding this initial, partial development of the Blue Goose Agua Caliente concession tell why the likely looking area behind the Andes has not been developed. The concession is but a few hundred miles — not a great pipe line distance — from the Pacific and an international market, but the mountains intervene. It is not only hard to get equipment in, but almost impossible to get the oil out.

It would be a very costly undertaking to build a pipe line from the Peru Montana to the Pacific, particularly if the prospective field was far from one of the few passes that are available. Even then, the line would have to rise to heights more than a mile above sea level. They would involve difficult engineering problems such as were encountered in the famous Barco line in Colombia, which reaches its highest point

at Rieber Pass, an even mile above sea level. To be economic, such a line would have to be of fair capacity, and only fields of high potential production and long life would justify one. It is well within the realm of possibility that such fields will be found in eastern Peru.

Practically all of Ecuador beyond the Andes, an area of almost 40,000 square miles, is held under concession by one oil company, and it will be obviously many years before such a vast area can be fully explored. The site of the first well was selected a year ago, but was so inaccessible that it was necessary to send in equipment by plane. There has been no past record of petroleum production in eastern Ecuador, but there are highly favorable prospects — sufficiently so to warrant the construction of an air field big enough to accommodate heavy transport planes in the interior of an almost unexplored jungle.

Colombia's Llanos, the plains area

Tent camp at site of carry-in rig operation at the Barco Concession near the Venezuelan border in Colombia



east of the mountains, is also in the stage of the most preliminary sort of oil exploration. There, a number of concessions have been acquired, and the drilling of the first well was begun about 18 months ago. This region, like those to the south, is difficult of access, but it can be reached by river boat and truck. It abounds in evidences of the existence of petroleum — possibly but not surely in commercial quantities.

Colombia has proof of the existence of Andean oil in the famed Barco concession where hopes were stirred anew by additional discoveries in recent years. This concession, though operations were begun years ago, is in territory so wild that conveyances are still covered with protective wire to shield the occupants from the weapons of the savage Morilones.

Like the Agua Caliente concession in Peru, the Barco was reached from the east. It lies on the Colombian-Venezuelan border, and equipment was brought in by way of Venezuela from Lake Maracaibo. The lake's rivers offered an easier means of transportation than the mountains that guarded Barco from Colombia's ports.

Maracaibo, the largest single proven reservoir of oil in the western



The village of Caripito and the Caripito terminal and tank farm, in eastern Venezuela. Although outranked by the Maracaibo region, eastern Venezuela is also a large oil producer as well, with further fields being explored

hemisphere, itself is in the Andean region, with mountains to the east and west. Hundreds of wells on tiny man-made islands of steel supported on concrete caissons dot the surface of the lake now, and the limits of its production have not yet been finally determined.

Despite the inaccessible oil in and beyond the Andes, South America is nevertheless the second largest oil producer in the world. Crude pro-

duction last year totalled 338 million barrels and reached a wartime peak this year of 940,000 barrels daily. Venezuela, Peru, Argentina and Colombia are the major producing countries, with Venezuela far and away the biggest. The last year has seen an intensified search for oil in South America.

In time, a way will be found to extract commercially the oil locked deep in the Andes.

Short Short Story

Oh Henry Legler

Coffee and Sweet Roll

That old stinker up on the 47th floor — what was keeping him, anyway?

If he could only go home like a civilized human being, Eddie could close up the elevator — and he and Pete, the night watchman, could go across the street for a cup of hot coffee and a sweet roll.

"Is everybody else down?" yawned Eddie.

Pete pushed a dirty finger nail up and down the night register. "Yeah, everybody but Mr. Klinkmeyer."

"Maybe he's got a dame up there."

"What would that old buzzard be doin' with a dame?" Pete gave a lop-sided grin. "More likely he's fixin' the company's books. I wouldn't trust that Klinkmeyer no further than I could spit."

Eddie gazed hungrily across the street at the neon restaurant sign — and his face brightened. "Hey, I got an idea. I'll buzz this crate up to the 47th and ask Mr. Klinkmeyer if he wouldn't like me to get him a cup o' hot coffee."

"Sure, why not," said Pete.

The elevator doors clanked and the steel cage began its long whirr up the empty shaft to the top of the building.

A little while later a rush of air announced the return of the elevator to the lobby floor.

Eddie stepped out with a puzzled expression. "Hey, I banged on old Klinkmeyer's door — but nobody..."

"O.K. kid," said Pete. "We can get our coffee now. He came down while you were up. They're out there cleanin' him off the sidewalk."



The new Ethyl movie shows that of the nation's 2 billion acres of land only 460 million are arable

THIS IS OUR

What soil conservation means to all of us is shown in a new Ethyl movie, which has been endorsed by the U. S. Department of Agriculture



Past neglect of the land has caused floods, dust storms, and soil erosion representing a loss of 100 million acres in 150 years



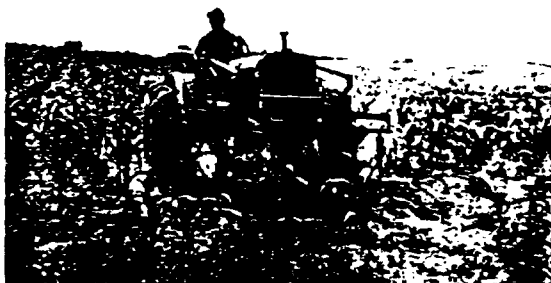
To prevent further erosion, farmers were taught contouring and other helpful soil conservation measures

DURING THE WAR, as everyone knows, the American farmer grew the greatest amount of food, fats and fiber in history. But this production job was not without its price. And that price lay in the extent of soil damage that took place under the urgency of the times.

Because of the insatiable demands of the war, the land was worked hard to grow more basic foodstuffs. But our wartime food requirements were so great that much of our farmland was cultivated intensively, large acreages were given over to essential — but soil-depleting — crops, and many normal peacetime conservation measures were put on the shelf for the duration.

Now with the return of peace there is a vital need to renew the battle of conservation on an even larger scale than before. Otherwise, we may see the same kind of devastation as occurred in the 1930's when Dust Bowl farms were blowing all over the United States.

To understand this grim situation, consider these facts. In the United States there are nearly two billion acres of land. But most of this is in



Modern farm equipment is an extremely valuable ally in furthering intelligent farming methods and in the promotion of soil conservation

LAND

forest and range, under lakes and rivers, in industrial areas and cities, in stony, unfertile waste areas, or those already abandoned because of over-cropping, over-grazing, and erosion.

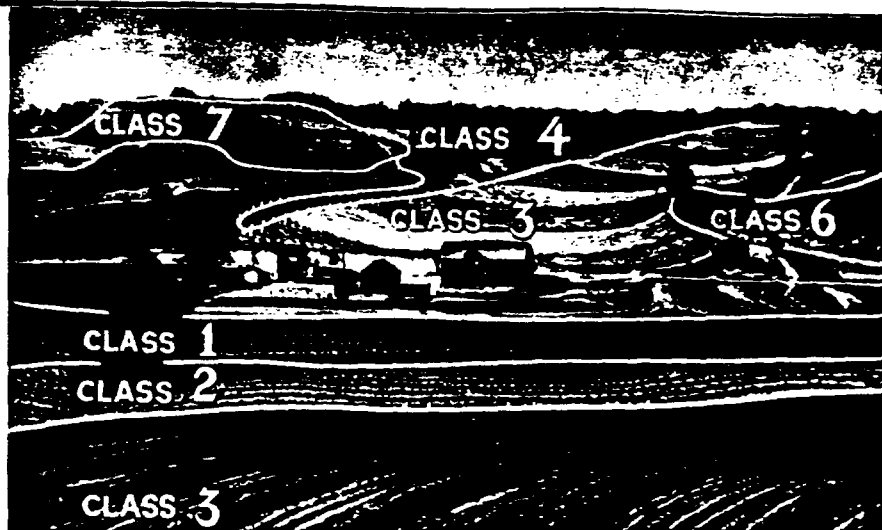
In less than 150 years, water erosion, wind erosion, and over-cropping have ruined more than 100 million acres for any further cultivation. This is equal to three times the total area of the state of Iowa. The result is that today there are only 460 million acres of cropland left. But the real danger lies in the fact that already one-third of this land is also on the road to ruin.

Film Tells the Story

To highlight the importance of soil conservation, Ethyl Corporation is presenting a new motion picture, entitled "This Is Our Land," which will be shown during the coming fall and winter months. The movie has won the acclaim of the Soil Conservation Service of the U. S. Department of Agriculture, which says:

"It has something important to show and to say to everyone. Men, women and children — in city and country alike — will know more about America after seeing "This Is Our Land." We in the Soil Conservation Service applaud those who made this production possible, and we hope you will give it the widest possible showing."

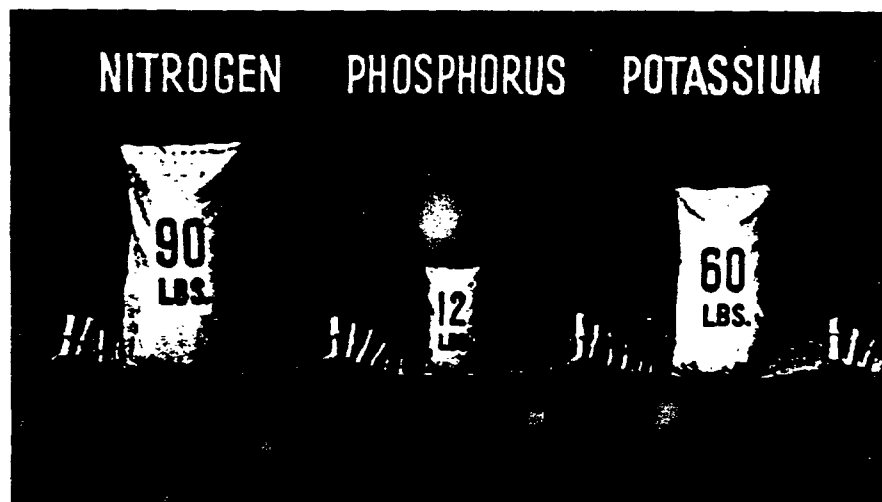
The movie explains what has been happening to the land of this nation. Level land is in danger of wind erosion, as people living on the great plains know only too well. Bare, sloping land, on the other hand, is



U. S. farm acreage consists of eight different classes of land, the movie explains. Soil conservation requires that different farming methods be used for each class



The chemistry of plants and the soil is graphically portrayed in the picture, showing how life goes on. This is what an acre of corn takes from the soil, and which must be replaced for continued fertility



always in danger of water erosion. When it rains, loose soil particles are washed into the soil pores. The pores choke up, and most of the rainwater is forced to run downhill on the surface.

The longer and steeper the slope, the faster the water runs off, and the more topsoil that's washed away. The run-off digs out small channels in the soil. As run-off continues to flow, these rills deepen and widen — the handwriting of erosion.

In time, they become deep gullies. Growing rapidly they frequently undermine buildings and roads, and ruin the contour of the land so that farming is difficult.

These gullies provide natural channels for the rainwater to flow unimpeded, carrying with it ever increasing amounts of soil and increasing the danger of floods.

The movie goes on to show what progressive farmers working in cooperation with the Department of Agriculture are doing to halt the blight of soil erosion and to restore fertility to the soil. Although the problem of soil conservation had long been explored by such agricultural scientists as Dr. Hugh H. Bennett, director of the Soil Conservation Service of the Department of Agriculture, it was not until a decade ago that national attention was awakened to the problem — and a broad program initiated.

With the United States Soil Conservation Service, state college agricultural engineers, and farmers working on the problem, much has been learned about how to save the soil and its fertility. With the knowledge gained, great strides have been made in protecting the soil from the evil effects of erosion.

The Soil Conservation Service made surveys all over the country to determine how each acre should be farmed for the best results and

for soil conservation too. As a result of these surveys farmland was divided into eight classes.

Class I land contains good soil on a level field where there is little danger of erosion. Here is the best place for row crops. Class II land is slightly sloping. The soil is good, but simple conservation practices like contour plowing and strip cropping are needed. Class III land slopes decidedly, making terraces and strip cropping necessary.

Land in Class IV is suited for limited cultivation only, and should be kept in hay most of the time. Class V land is not suited for cultivation, but may be used for pasture or woodland without any special conservation practices.

Land classified as VI and VII is suitable for pasture and woodland, but requires measures such as controlled grazing. High, rough, stony land of no use for farming is classified as VIII. This land is frequently good for wild life.

Toward Better Farming

When each farm acre has been put to its best use, as suggested by these various classes, a farmer will have taken his first big step toward conservation farming.

Also important is the fact that farmers replace essential nutrients in the soil that growing crops take out.

Corn and wheat, for instance, take from the soil and give nothing back. If there is a good yield of 60 bushels of corn and one and a half tons of stalks per acre, the corn has taken from each acre of soil about 90 pounds of nitrogen, 12 pounds of phosphorus, and 60 pounds of potassium.

The harvest of an acre of wheat that yields 30 bushels of grain and about three-quarters of a ton of straw will take from the soil about

36 pounds of nitrogen, 7 pounds of phosphorus, and 24 pounds of potassium.

On the other hand, legumes, such as red clover, are more cooperative. Clover, which produces 3 tons of hay per acre when harvested twice during the year, takes 13 pounds of phosphorus from the soil, and 125 pounds of potassium. But clover will build up one essential element — nitrogen.

That is the reason soil-exhausting crops like corn are rotated with crops like wheat and clover. Such a rotation slows up depletion of the soil elements. In addition, fertilizers need to be added regularly to the soil to replace the elements drawn out by staple crops.

The film goes on to show that even the most fertile soil is of no use to the farmer unless he keeps it tied down. Therefore, it illustrates how strip cropping, contour plowing, terracing, and grassed waterways are used to control run-off water and to retain the moisture. In areas subject to erosion by wind, the planting of shelter belts and wind-breaks helps anchor the soil.

The film points out that new high-compression gasoline-powered tractors are important allies in carrying out the necessary measures which will save this land of ours. The use of power is an essential part of efficient soil management. Conservation farming and power, together, mean more work in less time. They mean bigger yields, more profits, and better crops.

"This Is Our Land" was produced by Audio Productions, Inc., and both they and Ethyl had the benefit of advice and direction from a panel of agricultural scientists and technical consultants in the Soil Conservation Service. Leading tractor companies supplied some of the footage for the film.

These Were Things

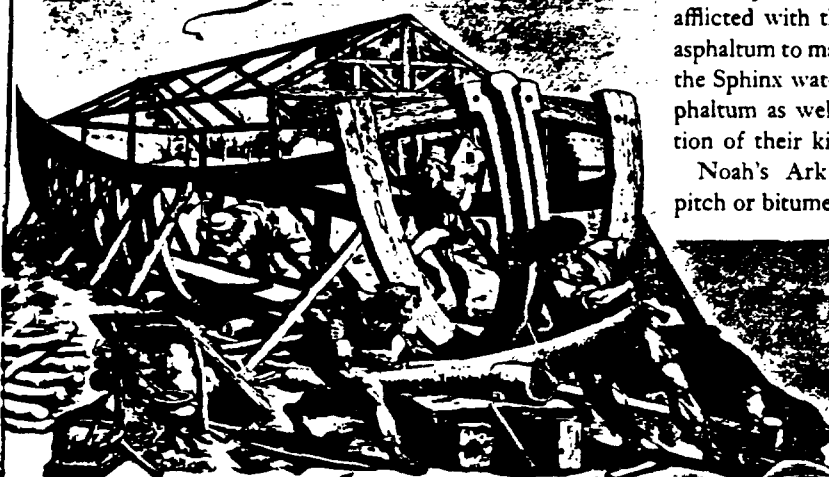
For centuries before the use of
petroleum was put to use

NOT UNTIL modern times did petroleum come into its own as a source of heat, light and power, but back through the ages, wherever oil was discovered, man watched it in wonderment or put it to fascinating use.

To the primitive cave man, petroleum pits and burning springs, which caught fire spontaneously or from lightning before man learned to ignite them himself, were a constant source of awe and of light and heat. Later generations of men burned the unfathomable rock oil found elsewhere in their mystic incantations and religious ceremonies.

In Biblical times, people used crude oil for medicinal purposes (chiefly for wounds and skin infections), poured it over their camels afflicted with the mange, employed asphaltum to make the Pyramids and the Sphinx waterproof, and used asphaltum as well in the mummification of their kings.

Noah's Ark was caulked with pitch or bitumen, gathered from the



Noah's Ark being built

In ancient Greece, the lamp of the famous Colossus of Rhodes burned crude petroleum

The Tower of Babel



Fire worshippers gathered around the sacred fires at Baku, on the Caspian Sea

shores of the Dead Sea as the off-throw of submarine seeps. The bond in the mortar for the Tower of Babel was an asphaltum, traces of which are to be found in the stonework of many ancient ruins in Asia

Minor and the Levant. Syrian hearths in the dawn of history were fired with briquettes made of partially burned ashes or coke cemented by crude oil.

An ancient religion, that of Zaru-

World War II had its flame-throwers; the ancients had "Byzantine Fire" — torches dipped in pitch and ignited



thustra or Zoroaster, dating from the sixth century, B.C., found its inspiration in the "eternal fires" at Baku on the Caspian Sea. The conquering Romans destroyed the Temple of the Flame of these fire worshippers, but when Marco Polo passed that way, in the 13th century of our era, he found the seeps still active and surrounded by devout supplicants. Today, superstition and commerce alike draw sustenance from the great oil fields whose wells are reputed to enjoy a lower rate of decline than experienced elsewhere.

A century after Zarathustra, Nehemiah, the restorer of Jerusalem, used oil for altar fires, calling the fuel nepthai or nephar, from which "naphtha" is said to be derived. The much afflicted Job knew a lighter moment when a rock "poured me out rivers of oil."

Oil as a weapon of war is not confined to modern times. In the dark days of World War II, the British were prepared to set the English Channel afire with burning oil, if the Nazis ever attempted an invasion — but according to ancient legend, the Greeks went them one better and actually destroyed a Scythian fleet by pouring oil on the sea and igniting it. Pliny, the historian, who mentioned the recovery of petroleum as an illuminant at Argrigentum in Sicily — a field still producing — distinguished between the gummy bitumen and the liquid naphtha, in which arrows were steeped. Petroleum also provided "oil for the lamps" of Rome, although the supply was insufficient to the need, and olive oil retained its supremacy.

One of the earliest sites of the refining of petroleum, particularly for medicinal usage, was on the shores of the Caspian. Oil was transported

to the refineries in *arbas*, Persian carts with nine-foot wheels, which, incidentally, were greased with bitumen. A barrel of oil was mounted on the axle of the cart, a second slung beneath. Distillation changed the black naphtha to a bright yellow "spirit," readily inflammable. An iron still, set in a brick support, was connected by a removable head to a copper worm condenser immersed in a hogshead of cold water. A working charge of 40 buckets of "black naphtha" produced 16 buckets of the finished product. The heavier hydrocarbons were discarded as sludge or burned as fuel for the still.

Plutarch records the production and use of petroleum at Kirkuk near Mosul, the site of palaces and pyramids grouped about the magical deposit. At Tekrit, on the Tigris river above Bagdad, "black naphtha" welled up from the bed of the river, covering the yellow waves with an oily mantle. Herodorus wrote of the oil pits of Ardericca, close to Babylon, and the flowing pitch spring on Zacynthus, an island in the Ionian Sea. Alexander the Great was fascinated by the eternal fires of Baku. Julius Caesar paused in his task of imposing the Pax Romana upon Gaul, to contemplate the *Fontaine Ardente*, near Grenoble, which had then been burning continuously for several centuries.

As with gunpowder, the Chinese are said to have discovered natural gas centuries prior to the Christian era, and the ancient literature of both that country and of Japan contains references to its use for lighting and heating.

Unearthed while drilling for brine, the natural gas was conveyed from the wells and used for lighting and heating besides being used for evaporating the brine. Some of the wells, incidentally, reached a depth of 2,000 feet, with bamboo poles being used

STRAIGHT DOPE

"You're outta luck, chum. Your straight ain't no good."

"Whaddaya mean no good? My straight beats your three queens any time."

"Not in stud poker, chum. Ask Mr. Hoyle."

And then the fun begins! *\$&#*#!

This little scene has taken place in many a stud poker game all over the land where Americans gather, and the controversy will rage on, perhaps, forever.

But *Ethyl News* — being in a peace-loving mood — takes it upon itself to straighten the whole matter out.

North Clarey, Jr., started it in his September *Ethyl News* article, "Deal Me In," by declaring that "a straight is permitted in stud poker."

And then E. C. Emmons, Los Angeles, questioned Mr. Clarey by sending along a magazine article contending that "straights are no good in stud poker." And to support this "heresy" Mr. Hoyle is cited as the authority.

All in the spirit of good clean research, we went back to the Association of American Playing Card Manufacturers for the last word. To answer this common question, the Association has framed a "stock" answer which quotes Mr. George Henry Fisher's *Stud Poker Blue Book* published in 1934. According to Mr. Fisher there has been a lot of discussion whether a straight is allowable in stud poker and whether it beats three — all of which arose because of an error some time back in computing the frequency occurrence of straights. But it is generally agreed now — after carefully computing the frequency of a straight — that it has earned every right to come up in a stud poker hand. And just for the record, here is the way authorities agree as to the scale of relative poker values in five card hands:

Royal flush, straight flush, four-of-a-kind, full house, flush, straight, three-of-a-kind, two pair, one pair, high card.

But the playing card manufacturers association cautions us that there is actually no official ruling on this. Just take Mr. Fisher's word for it and keep on playing those straights close to the vest. The guy sitting across from you with three aces doesn't have a chance.

The ancient Chinese were said to have cooked their pots of food over burning wells



for pipe. It is interesting to note that the first commercial use of natural gas in the United States, by the Ruffner Brothers in 1808 at a site near Charleston, West Virginia, was likewise for the production of salt by evaporation. Petroleum was also known in Japan in early times, where a seventh century manuscript dubbed it "burning water."

During the Middle Ages, interest in petroleum continued, but exploitation of its powers was usually confined to natural seepages into shallow pits and some rudimentary distillation or "cracking."

Oil in the Middle Ages

A glass industry flourished about the medieval city of Salsomaggiore in northern Italy, made possible by numerous gas "springs." In gratitude, the municipal seal, adopted in 1226, bore a likeness of a salamander surrounded by flames. The lake Tegernsee in Bavaria was the scene of a 14th century pilgrimage to partake of Saint Quirinius' Oil, from a seepage famed for its healing qualities.

The "oil mines" of Pechelbronn, Alsace, which are still worked by shafts, galleries and collecting sumps, were first discovered in 1498. The fields of Galicia, hotly contested prizes of World War II, first yielded their "earth-balsam" in 1506. Shakespeare was but recently buried when Thomas Shirley besought the Royal Society to take note of the flow of natural gas at Wigan in Shropshire, England. The Rumanian "liquid bitumen" deposits, principal source of oil to the Nazis during the war, were discovered some 200 years ago.

The Burma fields, said to be worked for a thousand years, were visited in 1724 by the Dutch explorer, Hermann Boernaave. Oil from the wells was collected in large porcelain or earthenware vessels and transported to river craft where it

was poured into the holds. Previously, the Burmese had constructed a bamboo pipe line, but leakage had caused its early abandonment.

Over in the New World, Columbus on his third voyage in 1496 had discovered Trinidad and sighted the nearby islet of Cubagua. The island was a desolate sandspit, but a quarter of a century later three royal inspectors, making a survey for Queen Isabella, came upon a thick greasy black "sap" coming from a rock. They filled a barrel and shipped it back to Spain. On the island of Trinidad itself, while raiding the Spanish settlements in the year 1595, Sir Walter Raleigh saw a lake of pitch, and carried a sample of it back to England. Accordingly, British historians customarily ascribe the discovery of petroleum in the New World to their famous, though frustrated, countryman. One of the highly valued exports of the new British colony of Barbados, settled in 1625, was *manjak* or "Barbados tar," a type of asphaltum esteemed for medicinal usage.

Although the discovery of oil in the New World by white men came as news to them, it had been known and used for ages past by the aborigines.

California Indians used the tar pits at Los Angeles and elsewhere for the sites of solemn ceremonies celebrated amid the fumes and smoke of blazing hydrocarbons. Asphaltum from La Brea, the great pit near Los Angeles where many prehistoric animals were found preserved, and balls of tar gathered in the surf where California's offshore derricks now stand, were used to waterproof baskets, canoes and the funeral urns of illustrious ancestors. When the Spanish explorers came, they were met by cannibal Caribs, the nearly black aboriginal pirates, who terrorized Arawak inhabitants of the West In-

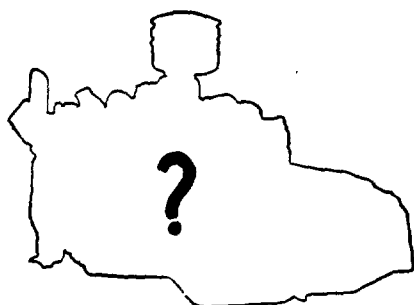
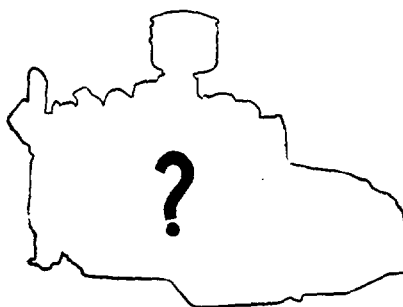
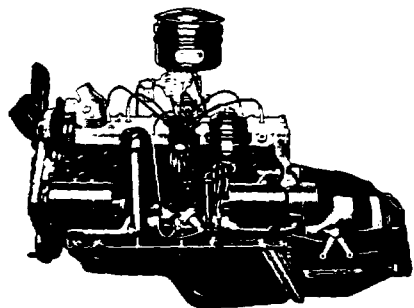
dian islands. These warriors' shields were plated with an armor of pebbles bonded by asphalt from seeps abounding in their domain. And centuries later, when the first European settlers came to America, they found the native Indians using crude oil as a general specific for their ailments. And that's how the settlers in time added "Seneca oil" to their own pharmacopoeia.

In the continental United States, the first discovery of oil is credited to a French Franciscan missionary, Father Joseph de la Roche D'Allion, who discovered an "oil spring" in what is now New York State in the year 1617. In 1748, a Russian author and traveller, Peter Kalm, published a map of the oil springs of Pennsylvania. George Washington, while exploring the West Virginia wilderness in 1776, came upon an oil spring and later bequeathed to his country the "burning spring on the banks of the Great Kanawha."

Colonel Drake's successful oil well, drilled in 1859, marked the start of the oil industry in the United States. But back through the ages, wherever oil was discovered, these were the firsts the world over.

OUR PICTURES

Pages 6-9, Zoltan B. Biro; Page 12, courtesy Pan American Airways System; Page 13 (top), Thorlichen photo, courtesy World Petroleum; Page 13 (bottom) and Page 15, photos by Vachon, courtesy Standard Oil Co. (N. J.); Page 14 (top), courtesy World Petroleum; Page 14 (bottom), courtesy Oil and Gas Journal; Page 19 (center right and lower left), courtesy New York Public Library Picture Collection; Page 19 (lower right) and Pages 20-21, The Bertmann Archive.



HOW MANY ENGINES ARE THERE IN YOUR LIFE?

LET'S SEE—there's the engine in your car. That's one. But don't answer the question too quickly; you may be overlooking dozens of other important engines.

For example, when you came down to breakfast this morning you found a bottle of milk that had just been delivered in a milk "wagon" hauled by an engine instead of a horse. Your rolls, eggs and coffee, too, came at least part way by truck. And the breakfast food you ate was probably grown with the aid of a gasoline-engined tractor.

There's a good chance you came to work on a bus. That's another big engine to remember. The airmail letter waiting for you on your desk got there with the help of two—maybe four—powerful aviation engines. And sometime during the day a motor truck will roll up to your door with materials for you, while perhaps

another one is delivering your products to your customers.

We could go on and on—but by now you've realized there is scarcely a thing you eat, drink, read, wash yourself with, make, buy or sell that isn't manufactured or transported with the help of gasoline engines. In fact, your life is full of engines. Doesn't it follow that when these engines are made more efficient, more powerful, more economical, more durable, you will benefit?

Our product, Ethyl antiknock fluid, helps petroleum refiners make higher octane gasoline, which in turn permits engine builders to build more efficient engines. Helping to improve engines, fuels and lubricants—the three must be considered together—has been the function of the Ethyl Corporation for the past two decades and remains our goal for the future.

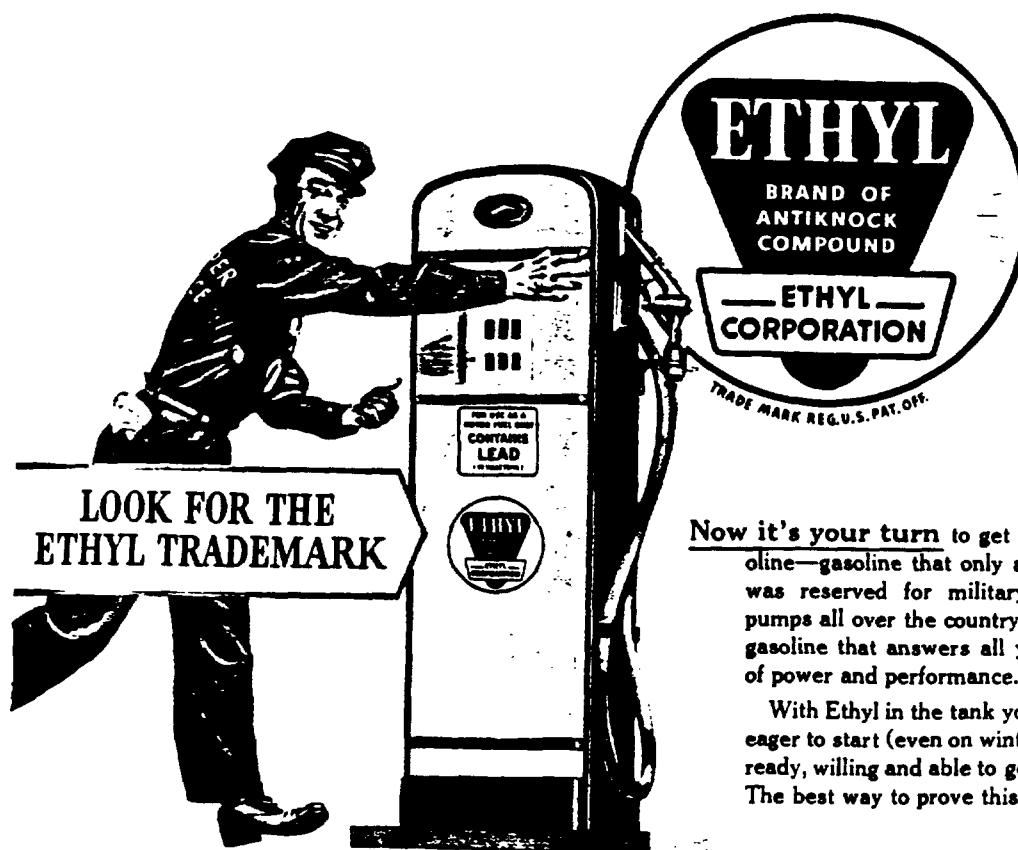


More power from every gallon of gasoline through

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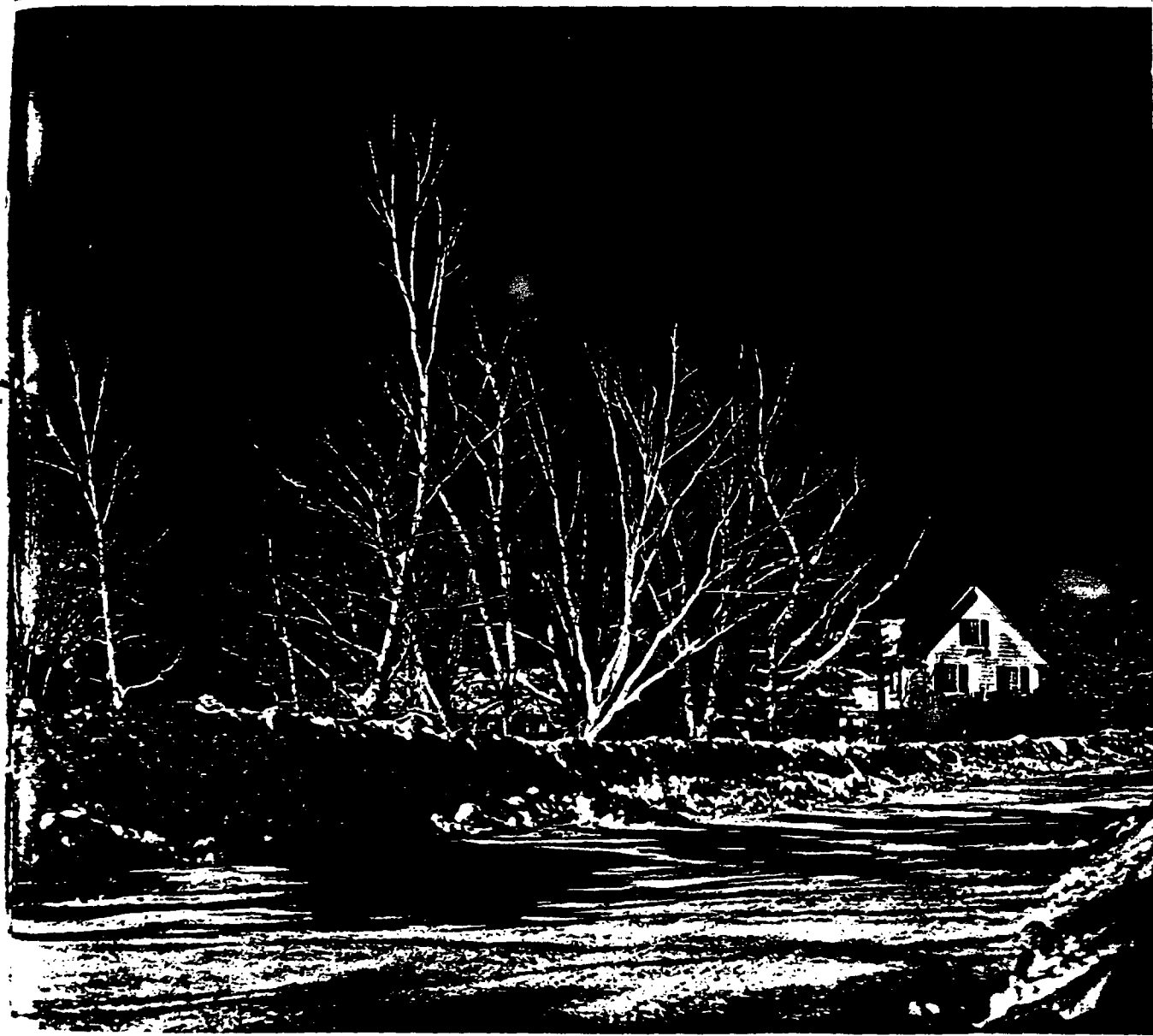


Now it's your turn to get high-quality gasoline—gasoline that only a few months ago was reserved for military use. At Ethyl pumps all over the country you can now get gasoline that answers all your expectations of power and performance.

With Ethyl in the tank you'll find your car eager to start (even on winter mornings) and ready, willing and able to go places...NOW! The best way to prove this is for you to—

ask for ETHYL

ETHYL NEWS



DECEMBER ★ 1945

ETC 32224



IN THE

ETHYL NEWS

DECEMBER 1945

Under a plan of reorganization of the management and operations of the Manufacturing Department, William Irwin has been appointed Assistant Resident Manager at the Ethyl plant in Baton Rouge, Louisiana.

He joins Ethyl after an association of twelve years with E. I. du Pont de Nemours and Co. During 1943 and 1944 he was closely associated with the construction of the atomic bomb projects at Oak Ridge, Tennessee and Hanford, Washington.

Mr. Irwin began his service with du Pont as Assistant Construction Superintendent at the Chambers Works, then named the Dye Works, at Deepwater, N. J. When plans were developed to build the Ethyl plant at Baton Rouge, he was assigned in October, 1936, as Field Project Manager to superintend all construction work. He remained in Baton Rouge until 1941, when he went to Wilmington, Del., as District Superintendent of General Construction.

In June, 1943 he began to devote all his time to the construction of the government project at Oak Ridge, and supervised all construction until this plant went into operation late in 1943. Early in 1944 he was engaged in special work at Hanford.

In May, 1944 he returned to the Ethyl plant at Baton Rouge as Works Engineer in du Pont's Organic Chemicals Department which was in charge of the operations of several departments. In September of this year the management and operation of the entire plant were transferred to the Ethyl Corporation with Clinton W. Bond as Resident Manager.

STONEWALL JACKSON'S WAR

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Here's the story of a man with an unusual war assignment — building and operating the world's biggest service station.

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Postwar rackets in the making promise to take people for plenty . . . if they're not wise to the tricks of the slick.

NAMED TO NEW POSTS IN ETHYL RESEARCH

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Charles D. Hawley has been appointed Assistant to the General Manager of Ethyl Research Laboratories. He has been succeeded by John B. Taylor, Jr., as Assistant Director of Engineering Research.

WHITE COLLAR FARMERS

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Live in the country, work in the city, is a wonderful way to live. But there are ways and ways to go about it.

THE SALT IN YOUR LIFE

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Ordinary table salt is as old as time in its usefulness . . . but ultra-modern in its industrial applications.

CARS FOR THE REST OF THE WORLD

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For a real understanding of the importance of cars and trucks, take a look at the outside world.

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

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

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

Earle W. Webb, president; Percy L. Griffiths, vice president and treasurer; Julian C. Gonzales, secretary

ETC 32225

STONEWALL JACKSON'S WAR

Helping to fuel the invasion — and keeping our troops supplied — was a battle all its own

WORLD WAR II will be set down in the history books as a series of decisive land, air and sea engagements. But to many an oil man, the war was simply one hell of a "fill 'er up" job from beginning to end. Particularly to men like Lt. Col. Stonewall Jackson Warner, Jr.

And "Jack" Warner should know.

An Ethyl field representative before the war, Jack spent three solid years in the ETO — setting up field storage depots for petroleum products, first in England, then in France; operating the "biggest filling station in the world," from which mechanized ground units took off for the invasion on D-Day; shipping gasoline to France aboard U. S. invasion craft until seagoing tankers and Operation PLUTO (Pipelines Under the Ocean) could take over the job; fueling U. S. Army ground and air units in their final sweep across France and into Germany.

During all that time, he literally lived, ate and slept gasoline — in five-gallon cans.

He was responsible for the design and construction of the 14 huge storage depots, built up in England, where fuel supplies for the invasion were assembled. By D-Day, these depots had 18 million cans — 90 million gallons — of 80-octane fuel on hand.

To make that possible, companies of POL (Petrol, Oil, Lubricants) troops worked night and day unloading gasoline from incoming railroad tank cars, filling up the five-gallon jerri-cans, and then dispatching them to the advance field depots by freight car or truck.

The crews set up an assembly line operation for the job, usually working between two parallel railroad sidings. On one siding, gasoline-laden tank cars would roll in, while on the other, empty freight cars or gondolas waited to be loaded. In between stood row upon row of empty jerri-cans which were filled from hoses attached to a portable pumping unit. It all sounds simple enough, except when you realize that, at best, a POL crew had only an 80-gallon-a-minute dispenser to work with in filling the cans — and even at that, it was possible to decant only 60 gallons a minute as a practical matter. And remember, 90 million gallons were needed.

Meanwhile, if there wasn't a sudden unexpected order from GHQ to worry about, there was the problem of whether there would be enough jerri-cans on hand to do the job. Whether the gasoline already stored was in danger of contamination, deterioration, or fire. Whether the jerri-cans themselves would



stand up under strenuous battle conditions. Or whether, after all the grief that went into building up these huge depots, a Nazi buzz bomb or incendiary would come along and blow one up. After all, a five-million-gallon storage depot on fire is something to reckon with. It could spread indescribable havoc among the invasion forces.

Thanks to the supplies built up at these depots, every piece of mechanized equipment could be fueled up on D-Day, given an added 150 miles of travel in extra jerri-cans, and sent aboard the invasion armada. That job has been called the biggest filling station operation in history. But to catch its full significance, you have to go back a little bit — to the murky dawn of the war.

To begin with, when the war first erupted, England had nothing like the kind of oil storage and transport facilities that were one day going to be needed. And what facilities there were, had been severely damaged during the blitz — storage tanks particularly.

Nevertheless, from 1941 onward, a man-made miracle in oil movement evolved — a miracle that assumed such proportions that, by 1944, millions upon millions of gallons of gasoline and oil were streaming, as if by magic, to Britain's airfields and invasion ports.

Britain's railroad system and rail

tank cars, it must be said, materially aided in that job. Moreover, the capacity of its oil truck fleet was greatly expanded through the scrapping of small trucks, and the replacement with 2,000-gallon and heavier units. As a result, in 1944, with only 6% more trucks in service, their capacity was 30% larger as com-

pared with 1939. But the biggest feat of all was the construction of an elaborate 1,000-mile pipeline system, inter-connected and studded with scores of secret underground storage tanks, each capable of holding huge reserve stocks of fuel. When the war reached its peak, these pipelines alone were distributing five million gallons of petroleum products daily, including large quantities of avgas.

Construction of the 14 field storage depots, for which Col. Warner was responsible, was in a very real sense a part of the over-all achievement.

From Nothing Flat

As was the case in other directions, there were no field storage depots on hand when he arrived in England back in 1942. Immediately, he was assigned to the job of conceiving them, selecting their sites, setting them up, and making them work. Besides this, he was charged with developing fire protection measures for the depots and with training men in oil industry techniques for the proper handling and storage of petroleum products. As part of this latter work, he prepared a Standard Operating Procedure for POL troops. And for good measure, he cooperated in some of the development work on the Ameri-cans, and latterly the jerri-cans, that were used, and he also assisted in developing a portable laboratory for the field testing of gasoline samples.

For the North African invasion, three fuel supply depots were set up. One of them was plump in the middle of the famous Newbury race course — and throwing in 12 emergency railroad spur tracks completely ruined, for the time being, that track for the business of horse racing. (Which made many British racing fans distinctly unhappy.) The

A caravan of truck-trailers, loaded with gasoline, on its way to the front. Each unit carried 4,000 gallons



Filling the five-gallon Ameri-cans from a tank car. Note the portable dispensing unit in the background



POL officers in charge were given only three weeks' notice to make available 11 million gallons of fuel in five-gallon cans. Yet, working with only 125 American soldiers and British pioneer troops, they finished that job on time.

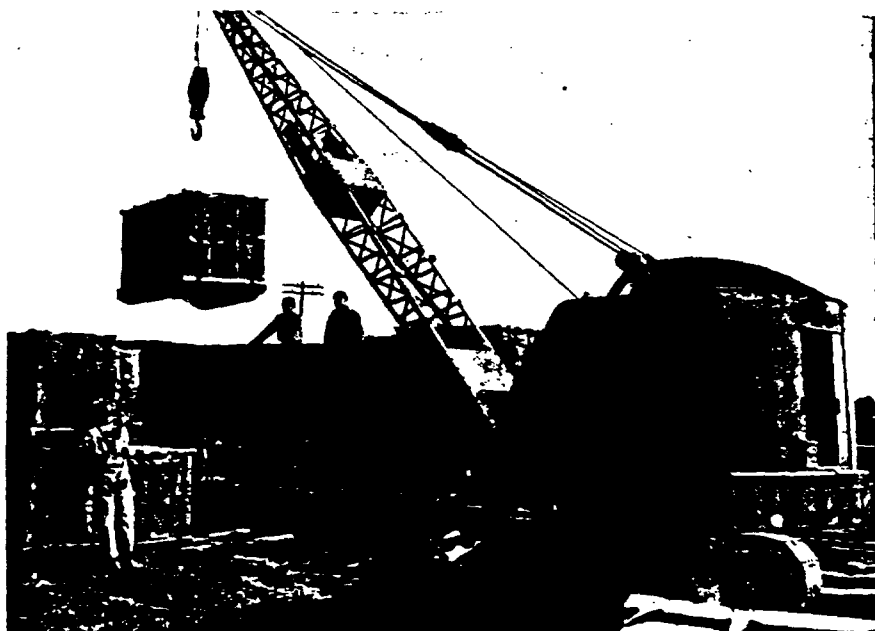
By the end of 1943, there were 14 fuel dumps, or depots, in operation — and ready for the invasion. Each of them had anywhere from a five- to ten-thousand-ton storage capacity; all were strategically located.

A typical base consisted of a varying number of stacks or bases, 56 feet square, laid upon specially prepared foundations of crushed stone, and connected by a network of gravel roads. Romney huts were used to store oils and greases. The stacks were covered with tarpaulins which then were camouflaged — and the tarpaulins served a double purpose. Not only did they provide protection against the elements; they quickly helped uncover any jerrican "leakers." Simply by lifting the tarpaulin off a stack, a POL inspector could detect any evidence of gasoline fumes.

Incidentally, the depot at West Moors, 12 miles in from the port of Bournemouth, was nightly littered with the metallic streamers thrown out by Nazi bombers to intercept the British radar. If the Nazis had dropped bombs instead of metallic streamers upon that depot, the effect might have been calamitous. Twelve million gallons of gasoline were stored there.

As a matter of fact, one of the storage depots was actually bombed. This was the one at Highbridge, near Bristol, originally a British ordnance dump. The night the Nazis paid their visit, it held eight million gallons of gasoline and six million gallons of Diesel fuel.

Watching the bombers come up the Bristol channel at rooftop



Cans of gasoline, mounted on skids, were the major source of supply during the first days of the invasion

height, the men at the depot saw them unload four 500-pounders and several hundred incendiaries . . . and they prayed. Not one bomb or incendiary went off! Later, when the bomb disposal squad went to work, it found that Nazi slave labor had deliberately sabotaged the bombs, before they were taken on the raid, by inserting their firing pins improperly. The incendiaries, by the way, bore the markings of their original dates of manufacture. The years: 1928 and 1937. An interesting insight into the German long-range plans and production for World War II.

Fueling the Invasion

Preparations for D-Day, as everyone knows, were many months in the making. And based on the experience in the North African campaign, this plan was adopted for fueling the ground equipment for invasion:

Every vehicle would be given, on the average, 250 miles of travel in its gas tank. In addition, it would be given enough five-gallon jerricans for another 150 miles, for a total

of 400 miles in all. This was based upon the assumption that a tank or truck would travel 50 miles a day; therefore, with 400 miles of fuel it had an eight-day safety margin before needing fresh supplies.

But it was one thing to have an elegant plan or scheme down on paper — and something else to do the actual job involved. Fueling the tens of thousands of vehicles that took part in the invasion was, without a doubt, the biggest service station operation in history. Here's how it was done:

Four main operational depots were located along the southern coast of England, another two to the east. (These dumps were in addition to the 14 previous POL depots.) Each of the dumps was only ten miles from the coast — and the danger of Nazi air attack — but it was decided to take that chance.

At each depot, an identical plan was placed in operation. That plan was the "Eight Point System" (Lt. Col. Stonewall Jackson Warner, Jr., author), and it went off like clockwork.

Fanning out from each depot

were eight dispensing points, each located about 100 feet apart along one of the roads a convoy would travel. Then, as a standard convoy of 21 to 26 vehicles pulled up for "service," the eight stations went into action all at once. Each dispensing point serviced a total of three vehicles, and within less than 15 minutes, the entire convoy was on its way. This meant that every vehicle's tank was filled to the brim, given whatever oil it needed plus the required number of extra jerri-cans of gas, and sent on to its date with destiny. And this gave the POL crew just enough time to remove the empties, bring up fresh supplies — and take on the next convoy. Around the clock 24 hours a day, the 1,250 service station "attendants" stayed on the job — working at night in pitch darkness. Convoy after convoy pulled up, was fueled, sent on its way, until finally the job was done.

As POL officer, Jack Warner was in charge of the Southern Base Section — the group of filling stations from which the majority of the ground vehicles took off. For his work in England, he was given the Bronze Star by the U. S. and was awarded a Member of the British Empire decoration by our Ally.

After the "rush of business" at the POL service stations was over, the next job was to ferry cans of gasoline across the Channel to the beachheads on the Normandy coast. This was done by previously loading the jerri-cans on wooden skids, tying them down with steel bands, and then lifting each skid by travelling crane onto a truck or freight car for shipment to the docks. Sixty cans, arranged in three tiers, were loaded on each skid. The skids were the neat invention of the Army's Transportation Corps; 5,500 of them were built and used.

During the first critical weeks of

the invasion, the jerri-cans of gasoline, loaded on skids, were a major source of supply to the Normandy beachheads. Subsequently, however, as the French ports of Cherbourg, Le Havre and Brest were made secure — and as the 20 cross-Channel pipelines went into operation — the importance of this means of supply diminished until it became more or less of a safety valve. Meanwhile, the stocks at the 14 POL depots in England had been drawn down from their 90 million gallons of fuel on D-Day to 11 million gallons in early September.

By this time, the war was sort of getting away from Jack Warner. And after weeks of cooling his heels around headquarters, he was finally given what he wanted most: assignment in France.

Getting the Fuel Up Front

For the Army oil men stationed in France, the problem had been, first, to build up large stocks of fuel at the coast, from which our forces could be supplied. This was done by means of the jerri-cans. Later, as bulk storage capacity became available, supplies were moved up from the Cherbourg peninsula through the six-inch military pipelines that eventually went to Chalons, or taken by Army truck along the "Red Ball Express" highway which carried only one-way traffic: direct to the supply dumps supporting the front lines. From these supply dumps, the supplies fanned out to the fighting fronts, carried by the Army tank trucks and truck trailers of 2,000 and 4,000 gallon capacities, and decanted into the jerri-cans until they were needed at the front.

Reporting to the Quartermaster's Intermediate Base Section in Rheims, early in September, Warner was assigned to the job of rehabilitating bulk storage plants in the Oise area,

which had been damaged by the Nazis. Eighteen bulk plants, plus some 150 pre-war service stations, were put back into operation there, under his direction. The French natives were very helpful in rebuilding the service stations, digging up for the repair crew the hose nozzles and other station equipment they had stealthily cached away when the Nazis came. When the job was finished, the 18 bulk plants were loaded with 12 million gallons of fuel. The depots supplied, among other needs, 80% of the aviation fuel used by the 9th Air Force until it moved up over the Rhine. For his part in this reconstruction program, Jack was awarded the Croix de Guerre by the French.

Meanwhile, hard on the heels of the rampaging Allied armies, fuel supplies fanned out to all the fighting fronts — to Antwerp, Liege, Luxembourg, Verdun, Dijon and southern France. As always, POL companies stationed at those points were kept busy decanting fuel from the Army trucks and pipelines into the jerri-cans, sending the filled cans on their way . . . and praying for the return of the empties! By now, they were handling a greater gallonage of gasoline than ever before, and they were greatly aided by an improved dispenser, rated at 100 gallons a minute, and equipped with a built-in fire extinguisher.

Then came the Battle of the Bulge.

As U. S. forces reeled back under the surprise blow, the POL depots were placed in great danger of attack and even capture. The Nazis came within ten miles of the depot at Liege — and millions of gallons of precious gasoline. In a six-week period, the Nazis sent over buzz bombs at the rate of one every three minutes. That depot was hit five separate times, one hit resulting in a five-million-gallon fire.

In mid-December, when the German counteroffensive was in full swing, Col. Warner was called from Rheims to Liege by his commanding general. The 82nd and 101st Airborne Divisions, he was told, after only a ten-day bivouac behind the front, were being sent up to help hold the important road center at Bastogne. To get there — and stick — they needed 100,000 gallons of gasoline. Only 2,000 gallons were on hand in Rheims. Warner was told to hunt up the remaining 98,000 gallons . . . and get them up there quick.

Suddenly he had an idea.

Previously, in an effort to conserve supplies for the front lines, Warner had rationed rear echelon troops to eight gallons of gasoline a day per vehicle. Several days' supplies could be obtained in advance at a time, but they were strictly accountable for.

Figuring on that "reserve" supply, Warner ordered the rear echelon vehicles stripped of all gasoline not in their tanks. From every direction, cans of gas came pouring in — in dribs, drabs and truckloads: by jeep, squad car and Army 6-by-6. Within 48 hours, the two divisions were loaded up — with gasoline, food, ammunition and everything else — and moved up front to Bastogne. What happened thereafter is history.

For his part in the "most beautiful" supply operation of the war, Col. Warner was awarded the Oak Leaf Cluster to his Bronze Star.

Soon after Allied forces had crossed the Rhine, the military pipelines followed in their wake. The indomitable Army tank trucks, too, played a big part in that six-million-gallon-a-day supply job. But one of the interesting ways in which our forces streaking through Germany were temporarily fueled, was by air lift over the Rhine.

Flying the Gasoline In

Workhorse C-47's were used for that job. Picking up cans of fuel at Metz, Verdun, Rheims, Soissons, and Paris, the transports flew on an average 150 miles to the Rhine — and another 50 miles or so to wherever the armies were presently battling.

In a little over a month, 2,000 trips a day were being made, with some million — and — a — half gallons being flown in daily. At the same time, an individual plane's cargo was increased from 100 to 140 loaded cans. Flying gasoline supplies in this way was of great assistance to the forward combat units. Frequently, the planes were able to locate the advance columns when surface contact was still impossible. But it was not without its price. A formation of 15

C-47's, flying to a rendezvous deep in Germany, landed on an airfield the Nazis still had pinned down with two 88's. All of them were lost.

Col. Warner served in France until last May, when he was forced to enter a hospital for treatment. A month later, he arrived in the United States with three Battle Stars, six service stripes, and the Croix de Guerre to his credit, besides his previous decorations. After a three-month period of convalescence at the Army general hospital at Thomasville, Ga., he was released from active duty and returned to work for Ethyl.

Today, Jack is back in his old job as Georgia representative for Ethyl, "and damned glad of it, too." Far, far removed from his daily life are the millions of jerri-cans he shepherded in the Army. But it is readily understandable if, every so often, he should have a nightmare about those cans — dreaming he was walking through some deep canyon in which there was nothing but jerri-cans all around. It's understandable, too, if he should wake up in a cold sweat some night, after dreaming he was pleading with a famous general who was "too — — busy fighting to return the empties." After all, he's seen enough cans to haunt him the rest of his life.

Short Short Story

Oh Henry Legler

MAN ABOUT TOWN

It was our first visit to the Pelican Club, where — I quote the guide book — "One dines amidst an atmosphere of Continental splendor, rubbing elbows with world-renowned celebrities."

Minerva's eyes tiddly-winked from table to table.

"Don't look now, dear, but that man sitting alone over there — isn't he the most distinguished looking person!"

I waited a polite interval before glancing over my shoulder.

A solitary gentleman in evening clothes was fondling the menu with the calm deliberation of a connoisseur. Hovering over him was solicitous Pierre, the "maitre d'."

Minerva whispered: "Dear, that's the kind of assurance I wish you could cultivate."

Frankly, I was impressed. The man's air of sophistication was something to be envied. Why, even at this moment he was discussing wine sauces with the head waiter in a tone of authority which only a gourmet would dare assume.

Throughout the dinner we watched him with furtive fascination as he made of each rare dish a ritual.

As we were about to leave the restaurant, I collected my courage, beckoned Pierre, and asked:

"Who is that gentleman over there in the evening clothes? He seems to know his food."

"Oui, monsieur," said Pierre. "he should! He is our very best waiter, No. 17. Strange fellow! He likes to eat here on his night off."



There's Money in It

**Not everyone is out to separate you from your money
... but keep your eyes peeled for the postwar rackets**

LOOKING FOR a job, son?" The young fellow in the new gray suit shifted uneasily from foot to foot. "Yes, I was," he said, mustering up a tentative smile. "I saw your ad in the paper, 'VETERANS WANTED,' it said. So I thought I'd hustle over."

"That's right," said the chubby little man with the polka dot tie. "My company is planning to take on a lot of veterans for its postwar operations." "This," he said, indicating the sparsely-furnished one-room office where he held forth, "is simply a temporary branch office. I'm just doing a little recruiting for the firm."

"By the way," he continued, "what experience have you had?"

"Well, I've worked a lot around machines in my three years overseas. I think I could make a pretty good repair and maintenance man."

"That's fine. I know of an opening that would pay you \$75 a week."

"Seventy-five a week!" The veteran beamed. "Why, that's the best offer I've had yet, and I've been looking for a job for six weeks now."

"Well, that's the way we believe in doing things around here," the older man said, blowing smoke rings into the air. "We believe in starting our employees off right."

He paused. "Oh uh, there's just one thing," he said, flicking a cigar ash off of his lapel. "I'll have to ask

you for a bond of fifty dollars. That's just to insure your responsibility, you know... and at the same time, it goes to cover the company's initial out-of-pocket expenses. But it's just a formality. You'll get it back within a month after you're on the job and proved yourself reliable. Just sort of a guarantee, you know."

"Oh sure," said the veteran, fishing out a wad of bills from his pocket. He counted out the fifty.

"That does it, then," said the older man. "Now, you just give me your telephone number and I'll be calling you in about two weeks. The com-

pany will be opening its real office in this city then, and you can start right in."

Two weeks later, the veteran waited for the phone call. There wasn't any. Another week passed, still no call. Finally deciding to find out what was holding up his job, he went down to the office where he was first interviewed. The office was empty. The little man was gone — smoke rings and all. Hours later, the veteran learned, upon investigation, that the little fat guy was a confidence man who had rooked him in one of the most reliable shell games ever practiced: the cash bond racket. In fact, he had managed to defraud eleven veterans out of sums ranging from \$25 to \$75, before he skipped town.

Scenes like this are not taking place in every city and town. But enough of them have occurred to make authorities deeply concerned. What they fear is that we may be on the threshold of a wave of postwar rackets, with war veterans among the principal victims.

Nor are veterans the only potential prey for the postwar promoters.

Now that the war is over, people generally are getting ready to convert their wartime savings into postwar ambitions. Hundreds of thousands are pulling up stakes and seeking new jobs. Hundreds of thousands more intend to start their own little businesses. Millions, collectively, are planning to buy, to spend, to invest, on an unprecedented scale.

And this is precisely what disturbs those agencies charged with protect-



ing consumers and investors against fraud. The mere fact that so many people will be spending or investing their money in postwar ventures, they say, is what gives crooks and racketeers a golden opportunity to fleece them. They see the same set of conditions building up today as followed the last war—when thousands of people lost their shirts.

Bear in mind that they're not crystal ball gazers. They don't know whether, as part of the general crime wave that is feared, there will be a recurrence of the big-time swindling such as swept the nation in the 1920's.

But of this much they're sure.

People are entering upon this postwar world with more spendable savings than ever before in history. Liquid assets in the hands of individuals alone are generally estimated to total around \$150 billion. Included in that total are nearly \$30 billion in the garden variety of Series E war bonds. It would be a national tragedy if people were to swap any part of these precious war bonds and other savings for worthless investments in schemes and stocks. Plenty of Liberty bondholders did it the last time, losing an estimated \$400 million.

That's why, in recent months, public and private organizations alike have been laying plans to strengthen further the cordon of protection around the consumer, the investor, the business man, the returning veteran. Law enforcement is being strengthened, additional curbs are being studied. For their part, the Better Business Bureaus, which combat fraud and misrepresentation in the advertising and selling of securities, merchandise and personal services, are distributing public warnings on likely schemes, exposing current war-born rackets, keeping an eye peeled for signs and

clues to the future.

Commenting on the general trend, H. J. Kenner, general manager of the Better Business Bureau of New York City, declared:

"To date, there has not been a sufficient number of cases to indicate the pattern that postwar frauds are likely to take. Yet, now is the time for the general public to be alert, particularly in those fields which are always vulnerable to promoters and swindlers. The great majority of American business, it should always be remembered, is honest and reputable and deserving of the public's confidence. It is only the small parasitical fringe of crooks and cheats which creates most of the trouble."

Vulnerable Fields

Without attempting to predict precisely what rackets and frauds may come about, it is easy to pick out the fields that are most lucrative. They include the securities field, real estate, new industries not yet come of age, and such assorted others as vocational training, general merchandise and charities. Take the securities field, for one.

Now that the war is over, any number of securities offerings will in time be made to the public. Capitalizing on new developments, new products, companies will be seeking funds to finance their enterprises, create new jobs, provide more and better things for higher living standards. The great majority of these ventures, one can be sure, will be legitimate.

But along with the legitimate offerings, it is feared, will come the inevitable crop of dishonest ones seeking to defraud investors, if they're not careful. This may be particularly true among brand new companies in brand new industries, it is believed.

After the last war, crooked promotions in oil, automobiles and radio took their toll among uneducated investors. After this war, there is likely to be a new bunch trading on the intriguing names of "plastics," "electronics," "radar," "synthetics," and other terms that have churned the public fancy.

Fortunately, there exists today a strong arm of protection around the investor. There is the Securities Exchange Commission with its widespread authority over securities and their sale, the various state securities commissions with their corresponding powers, the 86 Better Business Bureaus which carry on a ceaseless war against fraud. At the same time, the various stock exchanges and securities groups are likewise vigilant — as a matter of sound public policy.

But no matter how strong the laws, no matter how wary the policemen, one hard fact remains. Investors, particularly the small fry, are frequently their own worst enemies. They don't take advantage of the vast fund of basic information which is readily available about companies and their securities. Conversely, they seem to assume that since the federal securities laws have come into being, they no longer need to fear the racketeers. And then they invest in a questionable enterprise, lose their shirt, and wind up blaming "the whole damn thing on Wall Street." The Street gets another undeserved black eye — usually because some securities crook, unconnected with any of the reputable majority of brokers and dealers, has made off with the sucker's money.

Just as after the last war, we are again seeing a new generation of investors — but this time on a much larger scale. Today, they are war bond owners; tomorrow, many of them will be stockholders. And it is

the uninformed, inexperienced people in this group who most need to be educated against the pitfalls of securities trading. That's one reason behind the undercurrent of concern over the currently expanding public interest in securities.

Besides securities, direct investments in new companies or going concerns promise to be another tempting field for swindlers.

And here they'll have a chance to capitalize on the cherished hopes of several million little people: to own a small business. For these entrepreneurs, their big postwar aim is to open a radio shop, a service station, a meat market, a lunchroom. What they forget, though, is that in normal times over a thousand new concerns close down for keeps every day. Which is all the more reason they must be careful.

Veterans are high on the suckers' lists of swindlers who are waiting to take them for all they are worth. And that can be plenty. At the minimum, a newly discharged soldier has on hand between \$200 and \$300, consisting of any back pay due him, the first instalment on his mustering-out pay, and travelling expenses to his home. Add to this the soldier's personal savings and war bonds — and you have a sizable nest egg.

How, then, are these budding business men, veterans and civilians alike, vulnerable to swindlers? In lots of ways.

One dodge is for the swindlers to pose as business advisors or brokers ("I am only doing this for you because you're a veteran"), collect a juicy fee for their services, and sell the sucker a debt-ridden business or one that could be carried around in a hat.

Then there are other advance fee artists who try to extort money for "services" or "expenses" not yet incurred — or sell you "exclusive" ter-

ritorial selling rights to a product. And, as always, there are those who hoodwink people into becoming absentee farmers — investing in a fruit, nut or fur farm hundreds of miles away. The investor then sits back and awaits his profits, but they seldom materialize.

One of the biggest is the partnership racket. A veteran, replying to a PARTNER WANTED ad, sees an office humming with activity. Telephones are clanging, secretaries are scurrying about, the pace of the office is slightly terrific. ("We're having one of our busy days, you know.") Not until after the veteran has plunked down his dough and become a "partner" does he find out if his firm has (a) any assets, (b) any business.

What should people do to keep from losing their money in a business even before they get started? Don't take hasty action. Make a thorough investigation before investing. Get claims and representations in writing. See if the promises and predictions really make sense.

The veteran has many special agencies to help him. They range from the separation center itself, where he is first warned against swindles, to the Veterans Administration and local agencies — all of which have able counsellors to give advice. And the strict checkup of loans under the GI Bill of Rights gives him added protection.

Where to Get Help

In addition, there are a number of other agencies whose services are available to servicemen and civilians alike. The Department of Commerce, for one, is greatly expanding its informational services on small business. The Better Business Bureaus have prepared a whole series of helpful pamphlets, including "Facts Veterans Should Know Before Starting a Business." Chambers

of Commerce, local banks, credit agencies can likewise be helpful. But it is highly important that people remember to take advantage of these aids.

Along with little businesses, employment also offers a lush field for the racketeers. Now that the war is over, millions of former war workers are pulling up stakes and seeking new jobs. The same holds true for the returning veterans who have no peacetime jobs to come home to. In the past, thousands of job seekers have been victimized by racketeers trading on their misery. Now, the same old rackets are being dusted off again.

What do these employment rackets look like? One consists of a "cash bond," payable in advance, for a job that doesn't materialize. Another is the "registration fee" which a fake employment agency will charge, without doing anything for the applicant in return. One of the biggest lies in the phony trade and correspondence schools, which "guarantee" you a job upon completion of their expensive training courses.

As with employment agencies, there are many reputable trade schools. But during the war, some disreputable schools have mushroomed into being. With inferior equipment, fifth-rate teachers, and expensive fees, they lured thousands of people into taking their courses, with the promise of a job held out after graduation. During the war, it was easy for them to pay off on their promises; people with any kind of training, good or bad, could get a job. But now, jobs are not going to be so easy to come by. For that reason, any trainee should thoroughly investigate a trade school's promises, before signing on the dotted line to take a course.

Are you one of those millions who have been saving up to buy a home?

Then you owe it to yourself to be sure of what you're getting, and not buy it blindly.

In the postwar housing boom that is anticipated, millions of new homes will be built which, all told, will bring a new measure of comfort and happiness to people. But if what happened in the 1920's is any criterion, there are bound to be a definite number of jerry-built houses, and those with other faults, which are going to turn that postwar dream house into a \$5,000 nightmare.

For that reason, it is highly important that the prospective home buyer carefully check its construction, location and improvements; examine closely the selling price, the assessed valuation, the probable resale value; and make sure that he has

a clear title to his property.

In general merchandise, a number of deceptions and misrepresentations are quite possible, in the present transition from war to peace.

One of them lies in the sale of goods previously denied and now desired by civilians. For early delivery of that postwar radio, refrigerator or what-have-you, an unscrupulous dealer may tack on an extra profit to his selling price. If so, the OPA can be expected to take a lively interest in the proceedings. Wartime grades of merchandise may be represented to be better than they are, in a retailer's desire to unload them. The disposal of surplus war goods poses many retailing problems, as it comes into competition with newly produced civilian merchandise. A

committee of the Better Business Bureaus has worked out a voluntary code for advertising and selling Army-Navy goods, which, it is believed, will obviate many misrepresentations. The deliberate chiseller, however, will still have to be reckoned with.

Looking ahead into the future, no one can predict with any accuracy either the kinds of postwar frauds that will be seen or their size. In coming months, the fact that millions of former war workers will still be unemployed, and seeking new jobs, will in all likelihood be a restraining factor in many directions. Doubtless the real test will come when reconversion has run its course and the expected postwar replenishment boom is in full swing.

NAMED TO NEW POSTS IN ETHYL RESEARCH



Charles D. Hawley

Charles D. Hawley has been appointed Assistant to the General Manager of Ethyl Corporation Research Laboratories at Detroit, and John B. Taylor, Jr. has been named to succeed Mr. Hawley as Assistant Director of Engineering Research.

Both appointments are part of an over-all plan designed to increase the effectiveness of Ethyl's research laboratories in their postwar studies with oil companies and manufacturers of engines and engine

parts. Earlier steps in the reorganization of the laboratories to attain a level of maximum service to the petroleum and automotive industries were the appointments of Earl Bartholomew as General Manager of Research Laboratories, John B. Macauley as Director of Engineering Research, and Robert V. Kerley as Director of Aeronautical Research.

The appointment of Mr. Hawley as Assistant to Mr. Bartholomew continues a business association that began more than 20 years ago when both met at Harvard University, Mr. Hawley as a graduate student and instructor, and Mr. Bartholomew as instructor in mechanical engineering.

A year after Mr. Bartholomew came to Ethyl in 1926, Mr. Hawley joined him as an engineer, during the time that plans were being made to move the research laboratories from Yonkers, N. Y. to Detroit. As Assistant Director of Engineering Research, Mr. Hawley assumed much of the responsibility for the establishment of the present laboratories in Detroit, as well as their subsequent growth and expansion, including the estab-

lishment of supplementary facilities at San Bernardino, California.

During his tenure as Assistant Director of Engineering Research, Mr. Hawley has had an important part in the Ethyl procedure of reporting research and the maintaining of a usable research report library. In his new assignment he will be associated with all phases of the expanded programs in the interdependent research on engines, fuels and lubricants.

Through fifteen years' association with Ethyl, Mr. Taylor is thoroughly familiar with all phases of the inter-relationship between engines, fuels and lubricants and their interdependence in the fields of research.

Starting as a field engineer with the Baltimore Division in 1930, he dealt with many varied applications of fuels and lubricants. In 1934 he began a fruitful period of work with the Technical Service Section in developments designed to effect the more efficient operation of vehicles in fleet services. Later, he became active in the development programs which were influential in the adoption, by manufacturers, of high compression engines for farm tractors.

Working directly with the Engineering Research Laboratories since 1939, he has been responsible in recent years, as coordinator, for research to improve the durability of engines and lubricants, devoting much time to development and research programs conducted at the request of various branches of the Armed Services.



John B. Taylor, Jr.



from her in five years. He also has a flock of chickens and several rabbits. So throughout the war when food was scarce and high-priced, the Thompson family had enough meat, fresh eggs, butter, milk, and cream to satisfy it.

John hired a neighbor to work his land the first year. Then he bought a small tractor and outfit that included a plow, harrow, mower, and

WHITE COLLAR FARMERS

AFTER EVERY WAR there's been a back-to-the-land movement. For hundreds of thousands of families, there's been an irresistible urge every time to trade the crowded city for the wide open country. Today, once again, there's a back-to-the-land movement. This one may be the biggest ever.

That thousands of people intend to make farming their postwar livelihood is of course well known. But what about the many more who want to become "part-time farmers" — who will live in the country but keep their jobs in the city?

For these people, their dual life holds the promise of a double blessing. Not only can they enjoy all the advantages of country life. They can also achieve a greater measure of financial security and independence than if they lived — and worked — entirely in the city or country. They can have their cake and eat it, too.

Their automobile provides swift transit between home and job. Their home in the country can have most of the comforts of a city dwelling. Modern, lightweight mechanized farm tools will help them do their chores around the farm. They can grow much of their own food, bask in the sunshine and fresh air of the

Live in the country, work in the city, is a wonderful way to live. But there are ways and ways to go about it

country, enjoy healthier and happier lives.

But there are ways and ways of doing it, farm economists will tell you. And how to tell the right from the wrong way can be seen in the tale of two families.

Take the Thompson family — John, his wife, Peggy, and their three young children. John, an accountant, decided back in 1940 that he had had enough of living in a city flat. He talked the whole matter over with his wife and found that she was in agreement with his plan to move to the country.

After carefully examining several places they decided on a "farm" located ten miles outside the city. The price was \$2,500. John, who earns a salary of \$60 a week, had about \$1,500 saved up. He made a down payment of \$800 and gave a mortgage for the balance.

The "farm" had a house — not too large, but comfortable — a barn, a few acres of cleared land, and a woodlot.

The first year, John bought a Guernsey cow. Soon the cow gave birth to a fine heifer calf. John still has that old cow, with three heifers

rake. He gradually acquired at auctions various other tools needed around a farm, so that now he does virtually all his own work on the land.

Their field is patterned in different crops much like a large farm — in this case, corn, oats, and grass. John usually has to get some extra hay from a neighbor to carry his cows through the winter. This is always obtainable in exchange for work with his tractor.

A fruit orchard in one corner of the little farm provided an abundance of apples, cherries, peaches, and pears. There's also a well-tended garden with a variety of vegetables. The Thompsons derive a great deal of enjoyment from working in their



garden. With a small outlay of money for seeds, they grow delicious, fresh vegetables, so that they are able to keep their table well supplied all summer long. During the summer, Peggy puts up hundreds of cans of vegetables and fruit, and a little meat. She says there are weeks at a time when the only groceries she buys are things such as coffee, sugar, tea, salt, and pepper.

The Thompsons are able to live much more cheaply in the country. In town they paid \$50 a month for a modest apartment. Carfare cost about \$7 a month. Clothes were a larger item, and of course, every morsel of food meant a cash outlay.

There is no rent to pay. Taxes and insurance on the country place amount to about \$90 a year—less than \$8 a month. Of course, they have other items of expense (for example, the mortgage payments and repairs on the house) but on the whole they find it far cheaper to live in the country.

John drives his automobile to and from work, but the expense is no more than what they paid for carfare and taxis in town. And now that plenty of gasoline is available the Thompson family derives a great deal of pleasure from its car.

Summing it all up, the Thompsons feel that they made a wise move when they purchased their little place in the country. They are free from the noise of city traffic and some neighbor's blaring radio. More, their farm has given them an added measure of economic security unknown to them before. Now they feel they can weather temporary periods of financial stress without any serious hardships. John has been able to save a fair sum of money, so that when the time comes for him to retire, he will be able to live comfortably without being harassed by financial worries.

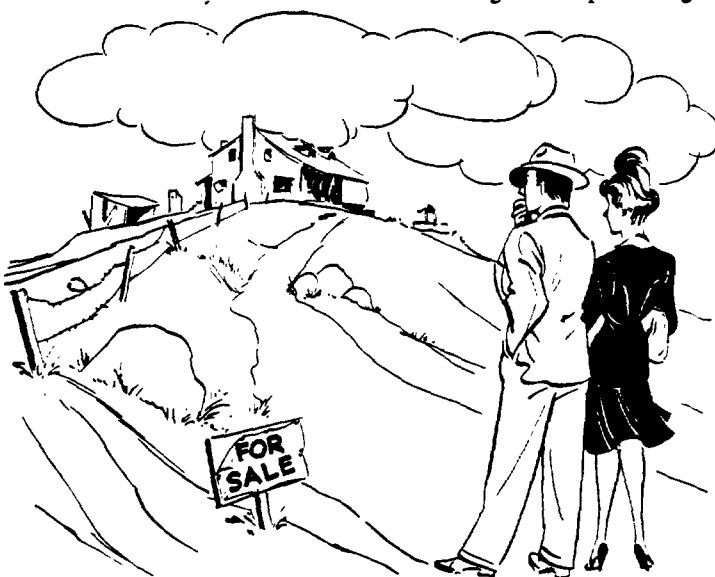
It would be fine if everyone were as fortunate as the Thompsons in the way their "adventure in contentment" turned out. But unfortunately, it doesn't always work out that way. This is because some people do not use good judgment in the farm or country place they purchase.

Take, for example, the case of the Smiths. A middle-aged couple with two children, they lived in a city apartment. All of the Smith family liked to get out in the country. So one summer Sunday afternoon,

and moved into their new home.

They had a wonderful time that first summer getting the quaint old place fixed up. But by the time autumn rolled around they had begun to grow a little tired of living in an isolated farmhouse miles from nowhere, walking a mile to the mailbox, and putting up with numerous other inconveniences. They also learned that the children would have to walk a mile to get to the school bus line.

A dirt road bordered their farm. It was in good shape during the



when they were out for a drive, they happened to stop at a picturesque, abandoned farm. The house was old and in need of repairs, but appeared to be sturdily built. From the front porch there was a beautiful view of a lovely valley.

Seeking out a local real estate agent, they were surprised to learn that they could buy the big house, the buildings, the land, and the beautiful view—all for \$2,000. This was just half what a none-too-pretentious house in the city would cost. So they made a \$500 down payment, signed a mortgage for the balance,

summer, but as winter came on it became impassable with mud and snow. So Bill Smith had to trudge a mile each morning and night to and from his car which he parked in the barn of a neighbor who lived on a paved road.

The Smiths struggled through the first winter. Then Bill lost his job in the city. With all their savings tied up in the farm, Bill decided to try to make it produce a living for his family.

But the farm had a thin, poorly drained soil and was located on a high level of ground where there was a short growing season. The

combination of poor farm and inexperience meant no crops to sell in the fall and hence no income. The Smiths couldn't meet the mortgage payment, their taxes, or any other bills. The result was that they were forced to give up the struggle. They went back to the city for keeps.

The story of the Smiths need not necessarily have had such an unhappy ending. They entered into an unequal contest in the first place by buying an abandoned farm. If experienced farmers who had preceded them had not been able to make a living out of the farm, it could hardly be expected that rank amateurs could make it pay.

There are other points to consider in selecting a farm. The most important, says Professor V. B. Hart of the New York State College of Agriculture at Cornell University, are "climate, soil, topography, markets, condition and adequacy of buildings and improvements, availability of good roads and other public services."

A prospective purchaser will do well to remember that farm land has three dimensions, not two.

As Professor Hart says, "When buying city real estate, a person is apt to be most particular about the length and breadth of his purchase. When buying a farm, however, many persons fail to remember that soil has a depth as well as length and breadth.

"Depth of the soil is one of the most important factors affecting productivity of land. Soil may vary in depth all the way from a few inches to several feet. It is much cheaper to buy fertility in the land than in a fertilizer bag, and a farm with only four inches of soil does not have the possibilities of one with several feet of good soil."

For anyone thinking of going

"whole hog" and giving up his job in the city to be his own boss by operating a farm, agricultural economists suggest it would be best to work as a hired hand for some successful farmer for a year or two. In that way one can gain practical experience without risking his savings in an untried venture.

Look Before You Leap

It would be wise to look over carefully the rural community in which a person contemplates locating, experienced back-to-the-landers advise, just to make sure that the people living there "talk the same language." In a large city, there are thousands of people from whom to pick and choose friends. In a rural community there are only a small number of people. Of necessity, therefore, a person's neighbors must be his friends — if he wants any friends at all.

A. B. Genung, an agricultural economist of the U. S. Department of Agriculture, offers some very worthwhile advice to people who would be part-time farmers. Says he, "It is possible, practicable, and profitable for many a man to work in a city and live out where he can have a few acres of land and what goes with it.

"Thousands of city workers are actually doing this very thing, with pleasure and benefit to themselves and their families.

"Remember, it takes money to own a farm, however small. You ought to have a little saved up — \$500, say; \$1,000 would be better. Veterans and many others can get credit, of course. But in the long run there isn't any real reserve outside of your own money. If you haven't any money at all, you'd better not try to buy a place. Rent one.

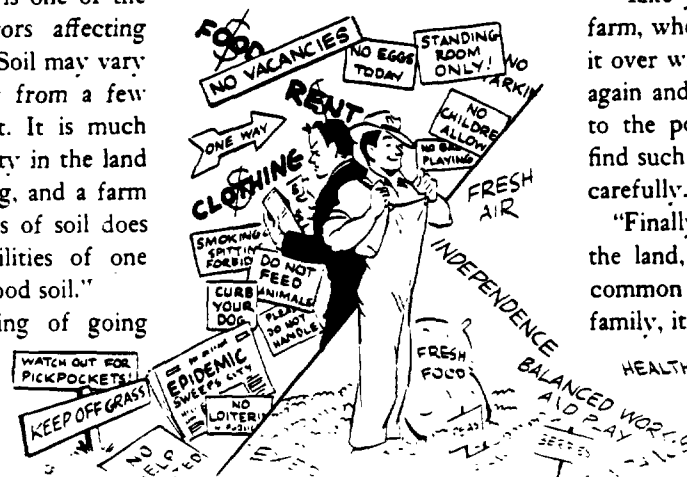
"A great deal depends upon your judgment in choosing a home place. Be sure to get on an all-weather road; and see that the place has a fairly comfortable house, good water supply, and electricity in or near. If you ignore any of those four things you'll be sorry.

"Don't try to undertake more farming than you can handle. That is one of the most common mistakes. If your job in town is really the main thing, keep it so in your plans. Don't think of the farm as anything more than a secondary job. Don't aim, at first anyhow, for much more than a good garden and perhaps a few hens. Later you may want pigs, a cow, more poultry, and fruit. But don't get yourself out on a limb at the very start.

"Do a lot of thinking about the future of your job before you anchor yourself to a little country place. If the job should fold up, is it a place that you could sell readily if you wanted to move somewhere else? Few part-time farms will return a living unless there is a dependable source of outside income.

"Take your time about buying a farm, whether one acre or 100. Talk it over with your wife. Talk it over again and again. When you get up to the point of really wanting to find such a place, look around very carefully.

"Finally, if you want to live on the land, go to it! With ordinary common sense, pluck and a willing family, it's a life fit for a king!"



THE SALT IN OUR LIFE

...superstition and religion, salt is nevertheless young in the countless modern applications found for it

SALT, one of the basic raw materials used in the manufacture of Ethyl fluid, is the most common mineral in existence. It is also one of the earliest substances known to man.

To primitive people, salt represented something that was not per-

ishable and, in turn, would keep foods from spoiling. Ever since then, man has used salt both to preserve food and to flavor it. Salt, moreover, has figured prominently in religious ceremonies and in superstitious beliefs, and even in medicine and money. Today, however, while some

In Medieval times the salt tax was an important source of revenue. Here is a collector examining a taxpayer's books



Salt as an ancient omen of ill fortune was portrayed in "The Last Supper"

of the superstition still lingers on, salt has come into its own as a basic industrial raw material.

Since early times, salt was associated with value and worthiness, as witness the Biblical statement, "Ye are the salt of the earth." In Eastern countries, it is a time-honored custom to place salt before strangers as a token and pledge of friendship and good will. Arabian princes are wont to ratify an alliance by sprinkling salt upon bread, exclaiming, "I am the friend of thy friends, and the enemy of thy enemies." During the Indian mutiny of 1857, a chief motive of self-restraint among the Sepoys was the fact that they had sworn by their salt to be loyal to the English queen.



An elaborate gold Italian salt cellar wrought by Benvenuto Cellini in 1545

The widespread notion that the spilling of salt produces evil consequences was probably due to the sacred character of salt in early times. Anyone having the misfortune to spill salt was supposed to incur the anger of all good spirits. Leonardo da Vinci evidently had this superstition in mind when he portrayed an overturned salt cellar before Judas in the painting, "The Last Supper."

Through the ages belief in the sacred properties of salt persisted. In Scotland salt was in high repute as a charm, and the salt box was the first chattel to be removed to a new dwelling. When Robert Burns, in the year 1789, was about to occupy a new house at Ellisland, he was escorted on his route along the banks of the River Nith by a procession of relatives, and in their midst was carried a bowl of salt resting on the family Bible.

Peculiar notions about the magical properties of salt were common among uneducated people in Scotland. In some regions a new tenant would not move into a furnished house until all the objects therein had been thoroughly salted, with a view to the destruction of witch-germs.

Roman soldiers received part of their pay in the form of salt, from which comes our modern word "salary" and the expression "worth his salt."

Among the ancient Chinese, salt was considered second in value only to gold, and it held an important place in the monetary system of the Great Moguls. Marco Polo, in the 13th century, wrote of flat cakes of salt, bearing the stamp of the Great

them to see that no other dish was placed upon the table before the salt was in position. With the peasant, a shell served as a receptacle for salt, but at the repast of the wealthy citizen a silver salt cellar, which was usually an heirloom, was placed in

Napoleon's soldiers, retreating from Moscow, lost many wounded, due to a lack of salt in their bodies



Khan, which were used as money in Tibet. Even today, salt takes the place of money in certain parts of Africa, Mexico, and the South Sea Islands.

Money in Ethiopia

When the followers of Mussolini invaded Ethiopia, the native hunters refused to accept Italian currency in exchange for skins, but instead used coin-shaped discs of salt. Right here in America, each member of the Onondago tribe of Indians receives from New York State an annual payment of salt, in accordance with an old treaty, as part compensation for ceding 7,300 acres of land back in 1813.

The Romans considered salt to be a sacred article of food, and it was a matter of religious principle with

the middle of the table, and this custom prevailed in England in early times.

Medieval salt cellars were often elaborate pieces of craftsmanship. Until the end of the 17th century, the rank of guests at a banquet was indicated by their seating with reference to the massive silver salt cellar. At the head of the table "above the salt" sat the host and his more distinguished guests. The less noble sat "below the salt." In the 11th century the laws of King Canute provided that any person sitting at a banquet above the position to which he was entitled should be "pelted out of his place by bones at the discretion of the company." Etiquette was somewhat vigorously enforced.

Salt has played a strategic part in great military engagements.

Napoleon's soldiers on the celebrated retreat from Moscow died by thousands as the result of wounds whose failure to heal was attributed to their prolonged deprivation of salt. The same circumstances were reported during the Paraguayan War of 1874. In our own country during the Civil War, one of the principal purposes of a Union campaign into Virginia was to capture a chief source of salt of the Confederacy located at Saltville. Even in World War II, the loss of salt contributed to the downfall of Japan. Said the Japanese premier, in reporting to the Diet on the reasons for Japan's defeat:

"As the importation of industrial salt from the continent diminished, the output of chemical industries based on the sodium industry had to decline with increasing rapidity, and we were confronted since the mid-

dle of the year with a possibility that the supply of explosives and other indispensable materials as well as production of metals would be impeded."

Primitive Salt Treatment

Old manuscripts reveal that 5,000 years ago in China, salt was obtained by boiling and evaporating the ash from sea weeds. In America scarcely a hundred years ago, Indian tribes, living near the ocean, evaporated sea water in open trenches. Those living inland obtained salt by boiling and evaporating the brine from salt springs to which buffalo and deer were wont to come.

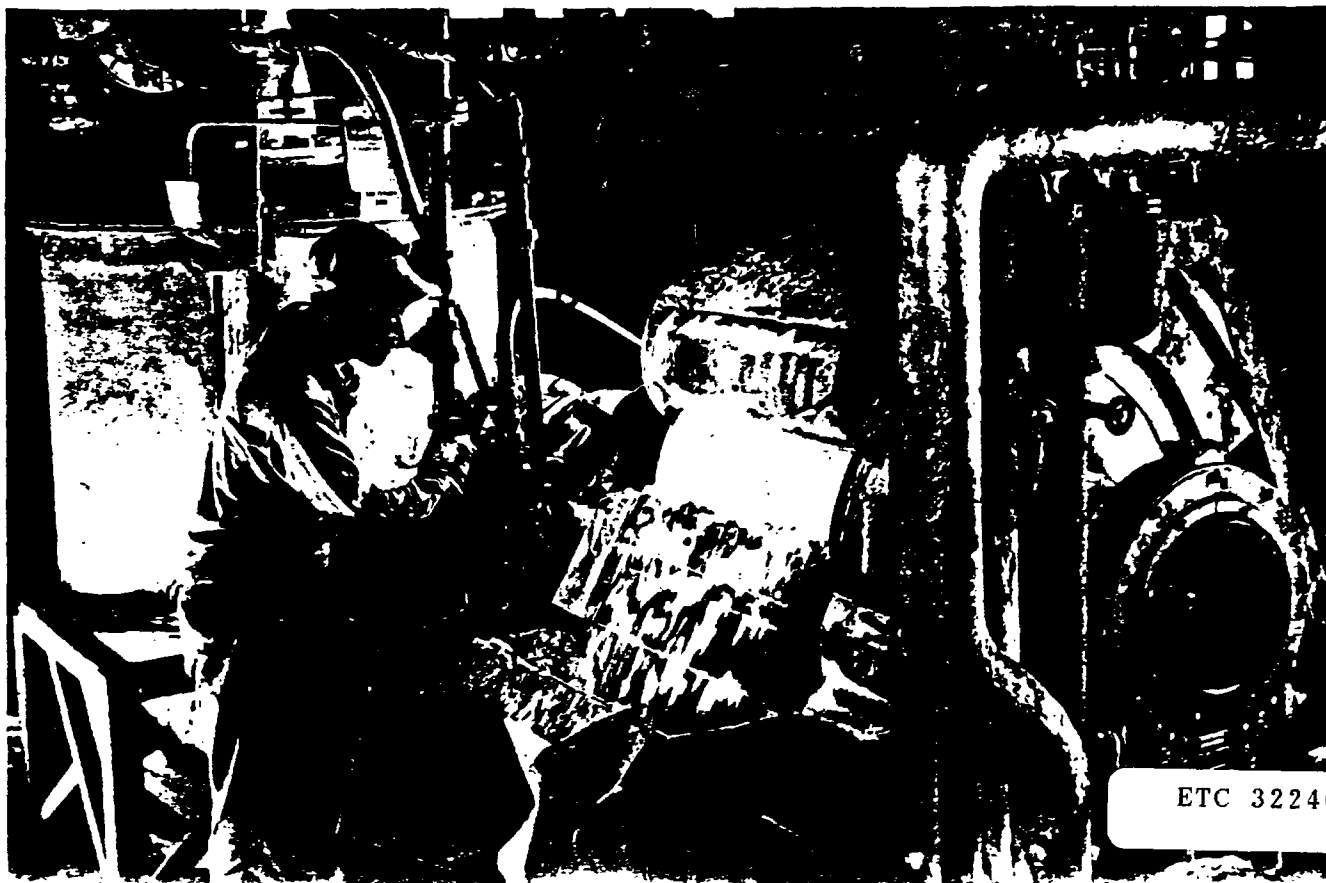
Early American settlers, living in the interior, underwent great perils and hardships to obtain salt. As might be imagined, salt was expensive, and at the time of the War of 1812 it cost \$5.00 a bushel.

Little change was made in the method of salt manufacture through the ages until 1886, when Joseph Duncan, an American, started a salt company at Silver Springs, New York. He employed a revolutionary new process — the vacuum pan process — which is still in use today. This method produces a uniformly grained salt of very high purity.

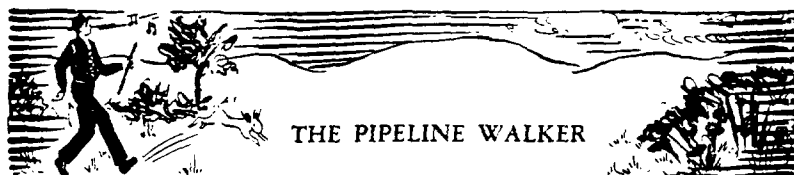


In Asia salt is laboriously obtained by evaporation. A worker is collecting the dry salt crust from each basin

Salt is an important raw material in the manufacture of Ethyl fluid. Here it is being filtered preparatory to being electrolytically decomposed



ETC 32240



THE PIPELINE WALKER

Where they cut a wide lane through the grove of pine
 I start from the station, walkin' the line.
 It's a right smart step Saluda river way
 But not half bad on a purty day.
 I take along a stick, when the grass is high,
 To whack at the snakes as I pass by,
 To fuzzle the bushes and see what's there . . .
 Transports wing it across a strip of air
 And a buzzard flaps and a rabbit scoots
 Out of a thicket and across my boots.

In the spring it's honey to sniff and smell
 And feel in my bones everything is well
 Just turnin' green twigs and poppin' up sweet
 With a lot of little flowers to slow my feet.
 Oh, yes, I mind the pipes, every joint, you bet,
 Whether it's cold or just plain wet;
 But it's a right smart step, as I started to say,
 When I'm walkin' the line Saluda river way.

Alice Wilson Oldroyd

Wells are bored and water is piped down to salt strata in the earth. The resulting brine is pumped up, filtered and purified. After evaporation in vacuum evaporators, the salt is drawn off and conveyed to dryers. It is then screened to separate crystals of different size used for various food and industrial purposes. Besides evaporation, salt is also mined.

The more civilization has progressed, the more demand there has been for salt. Today, over four million tons of evaporated salt are required annually for the home and for a vast number of farm and industrial uses. In the curing of hides and skins for leather, alone, 300,000 tons of salt are used annually. In the manufacture of rayon, caustic soda is employed, which is obtained from salt.

In so far as human needs are concerned, nutritionists estimate that adults require about half an ounce

of salt per day, or 12 pounds per year, to enable the various glands to hold the amount of water they need for proper functioning. During hot, humid weather, people consume salt tablets to replace the body salt lost through perspiration, and thereby ward off fatigue. Salt is also the source of an important component of gastric juice, both in the human and animal body. Upon receiving salt, the stomach changes its chloride component into hydrochloric acid in order to digest its food. The body divides the salt into its chemical constituents with the greatest of ease, but it takes elaborate equipment to do the same thing industrially. A good example of this is seen in Ethyl's plant in Baton Rouge, Louisiana.

There, salt in the form of brine is pumped in from wells 20 miles away. Since brine consists of salt and water, it is first necessary to remove the

water in order to obtain the salt. This is done by evaporation, in which the water is boiled off under a high vacuum by heating it with steam. The salt then crystallizes out to form a slurry or magma, which is pumped to filters which separate the salt from the liquor. After leaving the filters, the salt passes into gas-fired dryers where the last traces of water are removed. The purified salt is then delivered by conveyors and elevators either to the salt storage bins or directly by conveyors to the electrolytic cells, where it is charged.

This "electric chair" treatment decomposes the salt into its two elements, sodium and chlorine. The sodium is then used to form an alloy with lead, while the chlorine enters, among other things, into the manufacture of ethyl chloride. The final reaction of ethyl chloride with the lead-sodium alloy yields tetraethyl lead, the active ingredient of Ethyl fluid, which improves the antiknock quality of gasoline.

Besides its use in the manufacture of Ethyl fluid, salt has innumerable other industrial uses, both of itself and for its two elements taken separately. Sodium is employed in the manufacture of dyes, insecticides, and photographic materials, and in the treatment of metals. Chlorine, besides purifying water, is used to make hydrochloric acid, the "work-horse chemical," and enters into a host of other industrial uses. As for the salt itself, it is used as a gargle, and as an important constituent of some dentrifices, and figures in many drugs, pharmaceuticals and vitamins. And as many uses as have been found for this age-old substance, the research chemist is finding still more.

(The editors of the Ethyl News are indebted to the Worcester Salt Co. for much of the historical material in the foregoing article.)

CARS



Car owners abroad, after enduring far greater hardships than Americans, also look ahead to the time when new cars again can be had

for the Rest of the World

By James Stanford

AMERICANS aren't the only ones who want — and need — new automobiles. So do people all over the world.

Everyone is familiar with the wartime mortality of automobiles that took place in the United States. Overseas, that mortality was proportionately even more severe. For, besides the many cars that died of extreme old age (and a lack of repair parts), a great many more were destroyed by bombing and shellfire, or deliberately sabotaged to keep them out of enemy hands. As a result, there is a desperate need for cars in virtually any foreign country you could name.

At present, the outlook is still pretty grim for civilians in foreign lands.

True, England and Sweden, to name two pre-war manufacturers, have resumed car production on a small scale. Similarly, an export quota of 6% of our domestic production for 1945 has been set. But real replenishment must wait upon all-out production in the United States, while overseas plants, particularly in Europe, require a vast job of reconstruction.

In consequence, it will be a long time before the average foreigner can count on buying a new car or

truck. Instead, he will have to continue to ride his car until it falls apart — as he has always done.

Yet, that there is a vast overseas market for automobiles is emphasized by these wartime developments: Automotive vehicles have proved their worth, the world over, in supplying the Allied war effort. Military highways, built in Australia, Burma, the Middle East, Canada and the Americas, lay the basis for a greatly expanded highway traffic. And foreign countries which have supplied the United Nations with raw materials now have the purchasing power which they want to turn in for new cars.

The needs of Europe, whose automotive population was probably the most severely decimated, are readily imaginable. But take a country like Australia, whose car population declined surprisingly little: from 850,000 vehicles in 1940 to 722,000 in 1943.

During the war, a vast network of strategic highways was built down under, which for the first time tied all parts of the country together, north and south, east and west. These new roads are slated to give Australia a big lift industrially.

As part of this, there is a large postwar demand for cars and trucks. There are even plans afoot for Australia to produce its own cars, but these have not yet materialized. At any rate, trade sources place Australian demand at as high as 80,000 cars a year for five years — which is pretty good for a country of only seven million people. And, as in the past, Australians will continue their preference for cars of American origin, because they are big and sturdy, suitable for cross-country driving, and fairly easy to keep in repair.

The story is much the same in another British territory, the Union of South Africa, where nearly 350,-

Even before the war, the selling and servicing of cars extended from the Arctic to the Antarctic. Here is a car dealership in Reykjavik, Iceland



ooo motor vehicles are used by 2.2 million whites in a country of 10.7 million. The Union maintains a purchasing mission in this country, which is trying to secure cars and trucks, mostly the latter, for the strong commercial and industrial development taking place there. Here too, American cars are wanted.

Or consider Mexico, which has

155,000 motor vehicles. That country has steel mills, power developments, oil, agriculture, and is on the Inter-American Highway. It is, too, a big tourist center which has had a tremendous wartime boom. Mexico's mass transportation system is ancient and decrepit, and the need for thousands of buses, among other vehicles, is desperate. So, for that matter, is Brazil's, where fuel shortages during the war cut motor vehicle operation from 220,000 to 145,000. Brazil's potential as an industrial nation is well known. And where will her cars come from? From the United States, of course. The whole western hemisphere, in fact, is nearly 100% American in its automotive preferences.

Jump halfway around the world to the Middle East, whose oil fields promise to be a major postwar factor. Iran, Iraq and Arabia learned during the war what trucks can do, when U. S. forces moved lend-lease supplies into Russia — through 150° desert heat and through the sub-freezing cold of 11,000-foot mountains. Before the war, these countries had among them some 19,000 vehicles, mostly trucks and taxis. They will need many more. So will Egypt, whose 34,000 units in 1939 are still running — but in a sadly patched-up condition — for Egypt is a stop on world airlines and a key to world transport routes by sea.

Or consider China, which has little left after the long war with Japan. China, woefully deficient in railroads, is a country broken up by rivers, plains, and mountains like a scenic railway. Trucks are vital to her economy, and to the development of her industry in the interior. Already, more than 15,000 U. S. Army vehicles have been put at the



A service station in Argentina. South America is a big market for automobiles—and gasoline



When normal transportation routes were blasted overseas, automotive vehicles pitched in and saved the day



Now that the war is over, automotive vehicles will play a big part in the postwar reconstruction

disposal of the Chinese, with another 4,000 promised. Many more will be needed when China recovers from its internal strife and sets about the task of reconstruction.

So it is the world around.

As U. S. car production hits its stride, as overseas plants are rehabilitated and put back into production, people of every nation look forward to the day when new model cars and trucks will again be available. And "Made in America" vehicles will be well represented. Before the war, some 10% of U. S. passenger car production, between 25% and 28% of its truck output, went into export channels. In the decade, 1931-1940, the United States exported some \$2.4 billion worth of automotive equipment.

To Keep 'Em Rolling

Meanwhile, foreign nations have received help from the United States, in easing their motor vehicle deficit, by means of lend-lease. Under the Act, hundreds of thousands of vehicles were exported overseas to help in winning the war. Now these military vehicles are being converted to peacetime transportation tasks and will fill in the gap until new cars and trucks are again forthcoming in volume. At the same time, it seems pretty certain that a lot of U. S. Army vehicles will be disposed of in the Allied countries where they saw service, instead of being returned to the United States. These, too, will aid in easing foreign needs for vehicles, particularly for trucks.

It sometimes comes as a surprise to an American to learn just how widespread automotive use is throughout the world.

Before the war cut its swathe, foreign countries were making use of some 14.3 million motor vehicles. Added to the 30.3 million cars,



New British postwar automobiles are already being manufactured and sold to users. Here is the Riley

trucks and buses in operation in the United States, they made for a world population of 44.6 million motor vehicles, at the beginning of 1940. And to sell and service these overseas vehicles, car dealerships and service stations extended as far north as the little Finnish city of Rovaniemi, inside the Arctic Circle, and as far south as the Chilean town of Porvenir, in Tierra — the islands off the southern tip of South America.

During the war, the foreign car population suffered a heavy mortality — from direct destruction, from a lack of repair parts, and because no new cars were available — but precisely how heavy, no one knows. Against the pre-war figure of 14.3 million, the 1944 World Motor Census, compiled by *The American Automobile (Overseas Edition)* and its Spanish counterpart, *El Automovil Americano*, could account for only 6.1 million registrations.

While the war's ravages were partly responsible for the tremendous decline, a great many cars were forced out of service by the severity of fuel rationing — far worse than anything encountered in the United States.

Nevertheless, people everywhere made heroic efforts to keep their highway transportation systems going during the war. In many countries, the destruction of railroads, or their commandeering for troop movements, made dependence on motor vehicles even more complete.

That is why people in Peru fitted parts from one car into another — and car parts into trucks, used tubular metal bedposts for parts, cut gears out of pieces of steel, using hand saws and files. That is why all manner of strange devices, called gasogenes, were developed all over the world to burn everything from straw to coal; they drove cars at only half their normal power — but they still drove them. That is why, too, tires were patched with cloth, wire, and string, and even had bolts driven through them to hold the patches on. That is why men in Australia tried embalming fluid and camphor balls for fuel, and people in France and England drove buses with huge bags overhead containing city illuminating gas.

They had to keep their cars, trucks and buses running, or die.

American soldiers back from



Traffic as it was before the war in Paris. It may be a long time before cars are again so plentiful in France

China tell of Chinese trucks running on producer gas, with a three-man crew needed for every truck. One man drove. The second rode on the front fender with a can of gasoline in hand to prime the engine whenever it sputtered on a hill. The third rode the tail gate, and held a block of wood to chock the rear wheels whenever the truck couldn't struggle up another foot of tortuous grade, and quit. In China, during the war, a large percentage of U. S. Army vehicles was even converted to running on alcohol, which was made from Chinese rice and sugar cane. This is how desperately short supplies were in that beleaguered country.

Let nobody think, though, that any motorist anywhere in the world will keep on using gasoline substitutes for one minute longer than necessary. The motor fuel substi-

tutes that were used were strictly a case of dire necessity.

In Europe, long accustomed to substitute motor fuels, gasoline from the hydrogenation of coal was a leading source of supply. This, together with alcohol, was the principal straight fuel used. In addition, there were gasogene units, burning wood, charcoal, coal, and peat, which yielded a producer gas (CO) that drove a vehicle. Compressed gases, carried in tanks, were also used, as were other combustible gases and liquids.

These substitute fuels, however, together with the bulky equipment they frequently entail, were decidedly inefficient. Furthermore, some of the fuels were very messy to handle, and a "filling" lasted only 50 miles at best. In the producer gas vehicles, the weight of the solid fuel usually used, together with the

equipment for burning it, was a heavy drag on the vehicle. Motorists found that in the compressed gas vehicles, the weight of the tank was an added load on an engine already laboring under an inferior fuel.

Now that the war is over, the substitute fuel-burning devices are being discarded as quickly as supplies of their normal motor fuels are again available. Motorists all over the world want to share in the improved grades of gasoline which generally have come out of the war, and in most cases they may be expected to gratify their desires.

And looking far ahead into the future, when the wreckage of the war has been carted away and the postwar reconstruction completed, people in the automotive export field look to a near doubling of the world's car population within a decade or two. Against a pre-war total of 45 million vehicles, they have set their sights on a goal of 75 million vehicles. And when that day arrives, they see no reason why, in non-producing nations overseas, three out of every four cars shouldn't also be American then, as at present.

OUR PICTURES

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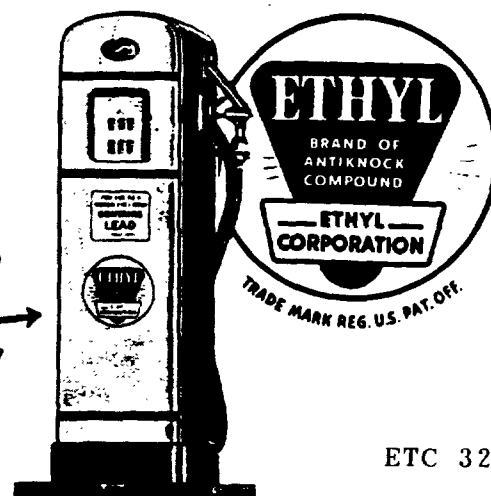


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