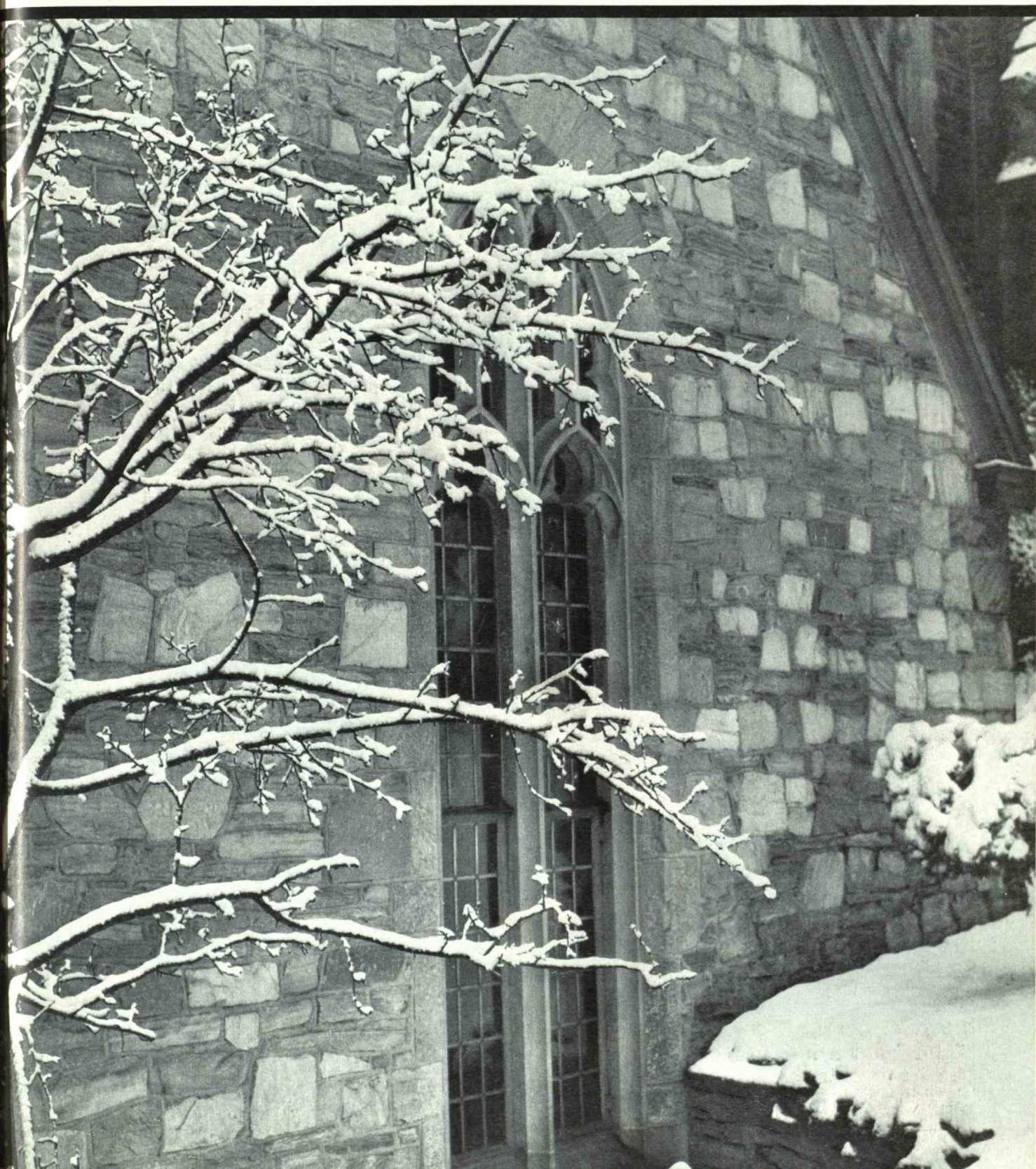
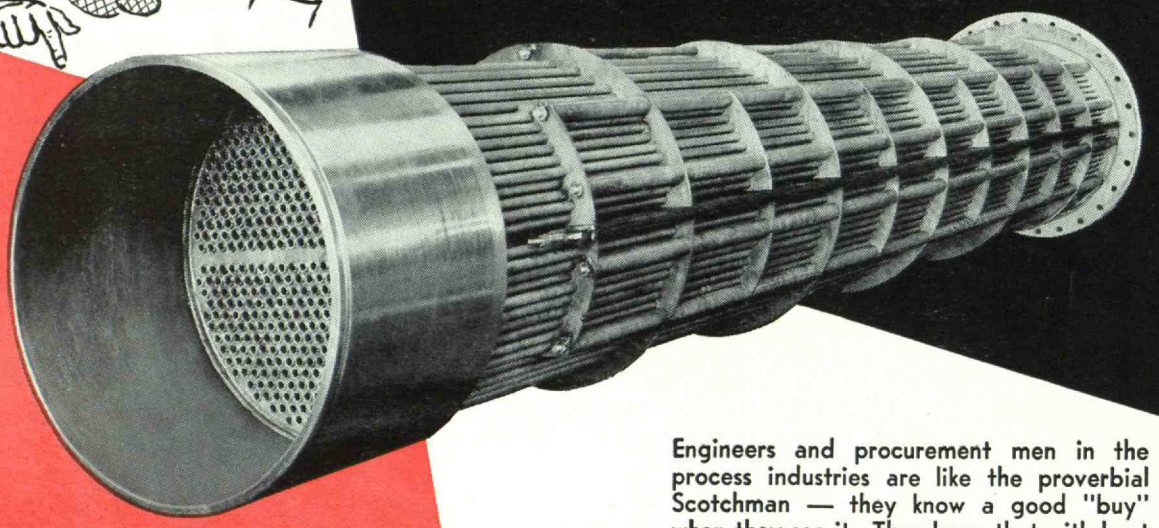
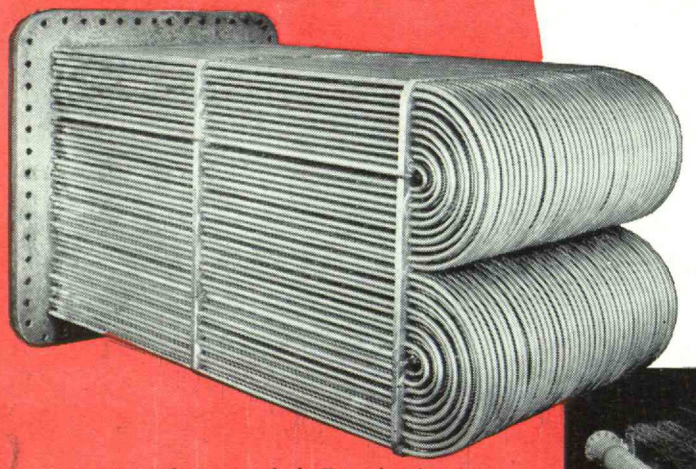
TECHNOLOGY REVIEW

January 1951



"A GOOD BUY IN HEAT EXCHANGE"

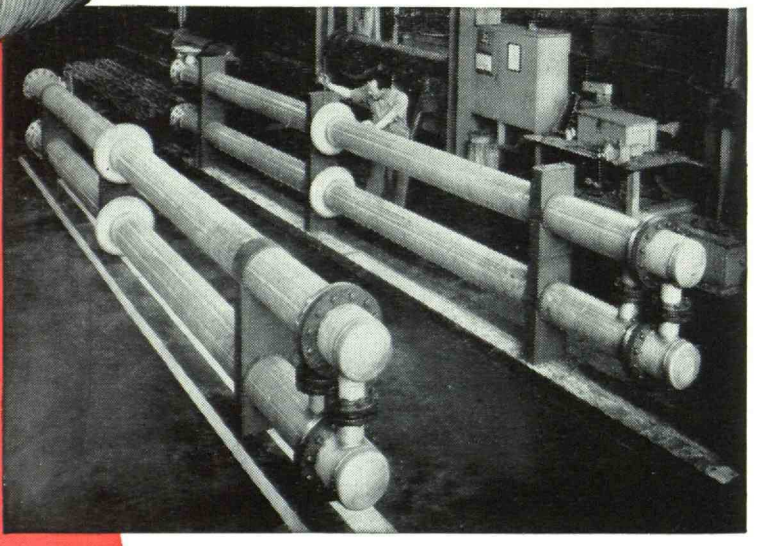




Engineers and procurement men in the process industries are like the proverbial Scotchman — they know a good "buy" when they see it. They know that with heat exchangers and other chemical processing units initial cost is only one of the factors in a buying decision.

Vulcan heat exchange equipment is designed to meet specific process conditions ranging from liquid air to Dowtherm, high vacuum to high pressure. Long life through quality construction is emphasized to meet either the ASME or API — ASME Code.

Assistance is given the customer in the economic selection of shell and tube types to be fabricated either fixed bundle or removable bundle with floating or outside packed head. A careful study is made on the details of design involving expansion joints, tube sheet covers, baffling, and multi-pass arrangements. The material used in construction may include stainless steel, carbon steel, nickel, copper, Everdur, phosphor-bronze, aluminum, Monel, Hastelloy, Ampco, and Karbate, the working qualities of which are familiar to Vulcan's engineers, fabricators and welders.



VULCAN | **CINCINNATI**

50th Anniversary
1901–1951

THE VULCAN COPPER & SUPPLY CO.
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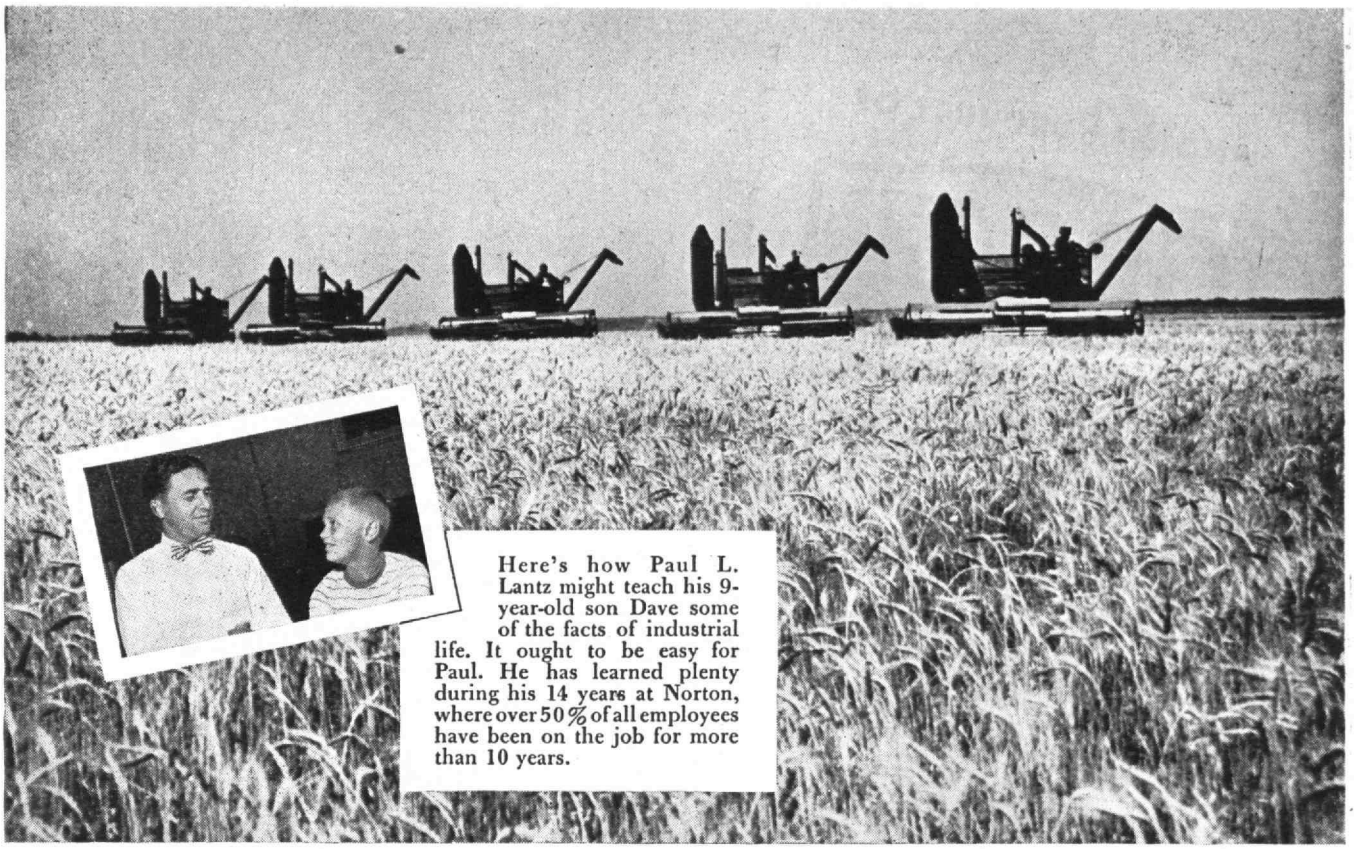
IN CANADA — VICKERS VULCAN PROCESS ENGINEERING COMPANY LTD. — MONTREAL



Here's how Paul L. Lantz might teach his 9-year-old son Dave some of the facts of industrial life. It ought to be easy for Paul. He has learned plenty during his 14 years at Norton, where over 50% of all employees have been on the job for more than 10 years.

A quintet of combines in action.

"Is Farming as easy as it looks, Dad?"

"No, son. It's just easier than it used to be, thanks to the farm equipment manufacturers who are always finding new and better ways to make farming more efficient."

"Diesel tractors give more power than 100 horses. Smooth, rugged power derived from accurate, close-fitting parts. Norton Lapping Machines finish these parts to closest tolerances possible in mass production.

"Parts like cultivator discs and plowshares, made of today's tougher metals, stand rougher treatment. Fast-cutting Alundum grinding wheels, or Alundum-coated polishing wheels, finish these parts *right!*

"Grinding and finishing implement parts, sharpening cutting tools, heat-treating metals for improved properties are among the vital farm-equipment jobs entrusted to Norton grinding wheels, machines and refractories."

"Yes, indeed, Dave, the Norton products I help make are an important part of the preparation of every meal you eat. As a matter of fact, just about everything that makes living worthwhile today is a little bit better because Norton products added something extra to it."

NORTON

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Making better products to make other products better

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NORTON COMPANY, WORCESTER 6, MASSACHUSETTS

BEHR-MANNING, TROY, N. Y. IS A DIVISION OF NORTON COMPANY

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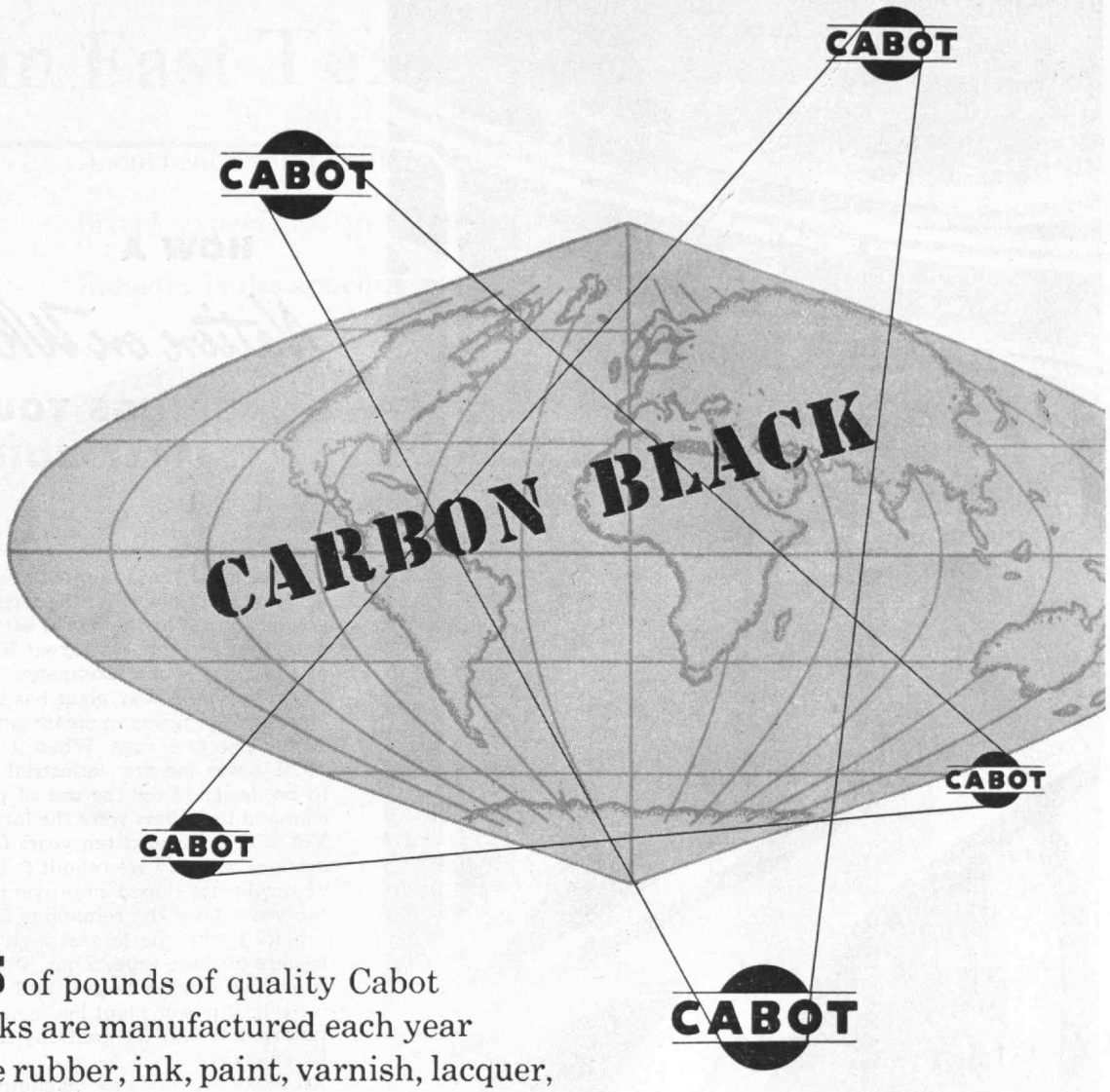

Millions of pounds of quality Cabot Carbon Blacks are manufactured each year for use in the rubber, ink, paint, varnish, lacquer, plastics and paper industries here and abroad. To do this big job are a dozen Cabot plants scattered throughout Texas, New Mexico, Oklahoma, Louisiana, and at Ellesmere Port, England.

Behind them stands an organization integrated to assure origin and delivery of the necessary raw materials, both gases and oils, as well as to provide for the sale and delivery of Cabot finished products.

It takes pipelines, tank cars, exploration and drilling crews, natural gasoline plants, steel fabricating shops and research and development departments to even begin to make carbon black — *Cabot has them all.*

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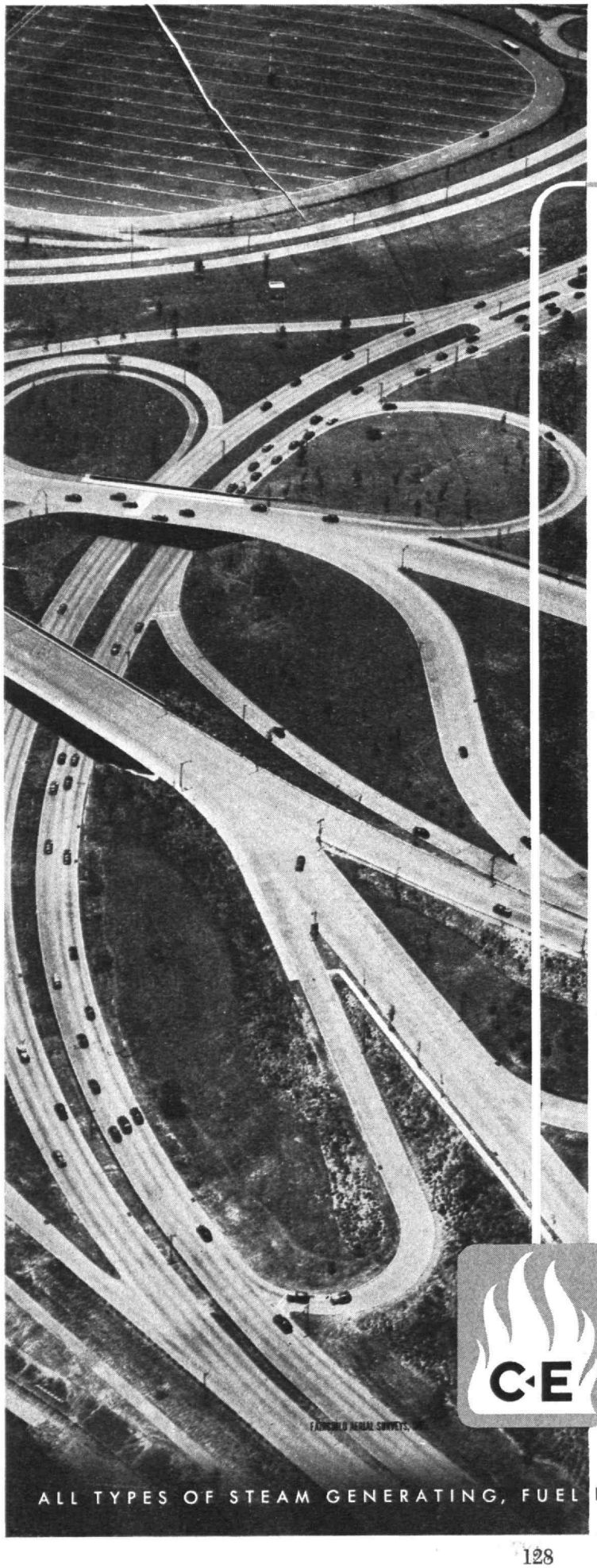

HOW A *Nation on Wheels* BRINGS YOU A BETTER BOILER

Considering the gigantic size of manufacturing operations in the automobile industry, it is not surprising that the largest industrial power station in the world serves an automobile plant – the great Rouge Plant of the Ford Motor Company.

No industrial power plant has kept so closely abreast of progress in steam generation as the one at Rouge. When it was built in 1920 it was the first industrial power plant to be designed for the use of pulverized coal and its boilers were the largest ever built. Yet within the next ten years four of the original boilers were rebuilt to take advantage of newly developed improvements and ten years later the remaining four had been replaced with the largest high pressure boilers of their time. Thus, within twenty years the world's largest and most efficient industrial power plant had nearly quadrupled its capacity and substantially increased its efficiency.

All the boilers and related equipment installed at Rouge ... initially and through every stage of its modernization ... have been of C-E design and manufacture. The experience of building these and many other boilers which have set new standards of practice and performance is built into every boiler which bears the C-E nameplate. It's an important part of the value you get when you buy from Combustion, and this is equally true whether your steam requirements be large or small.

C-E experience – *focused on your needs to bring you a better boiler* – is freely available. A letter stating your problem will receive immediate attention. B-421

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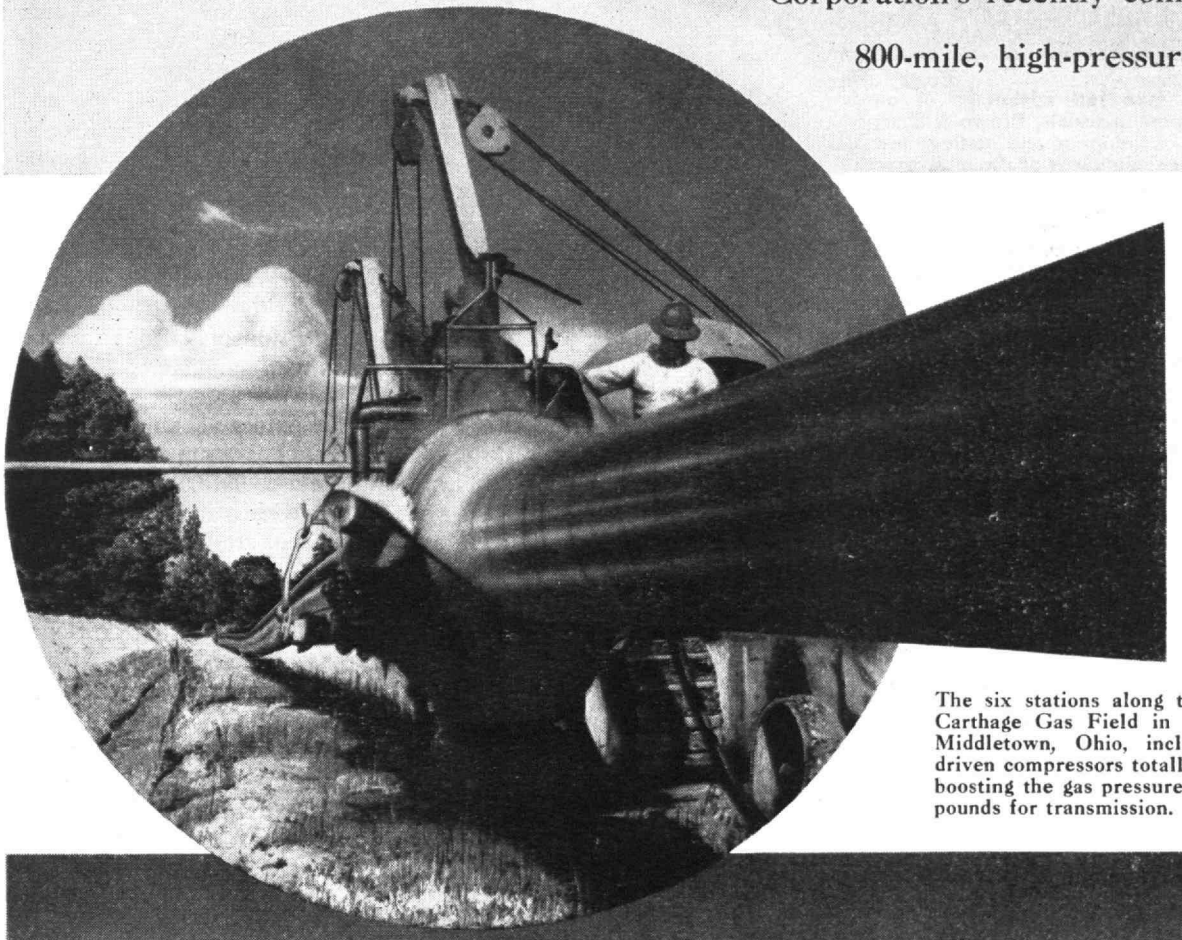
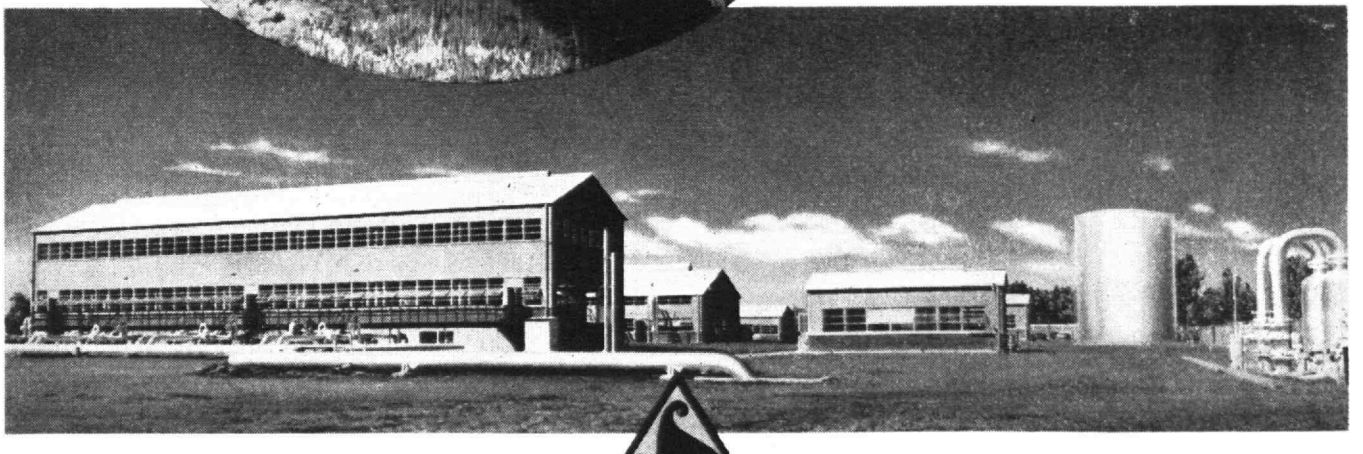
ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT

From East Texas to South Ohio

A current example of Stone & Webster Engineering Corporation's broad experience in design and construction for the natural gas industry is the six compressor stations on Texas Gas Transmission Corporation's recently completed 800-mile, high-pressure line.



The six stations along the line between Carthage Gas Field in East Texas and Middletown, Ohio, include gas engine driven compressors totalling 42,500 hp for boosting the gas pressure from 575 to 800 pounds for transmission.



STONE & WEBSTER ENGINEERING CORPORATION

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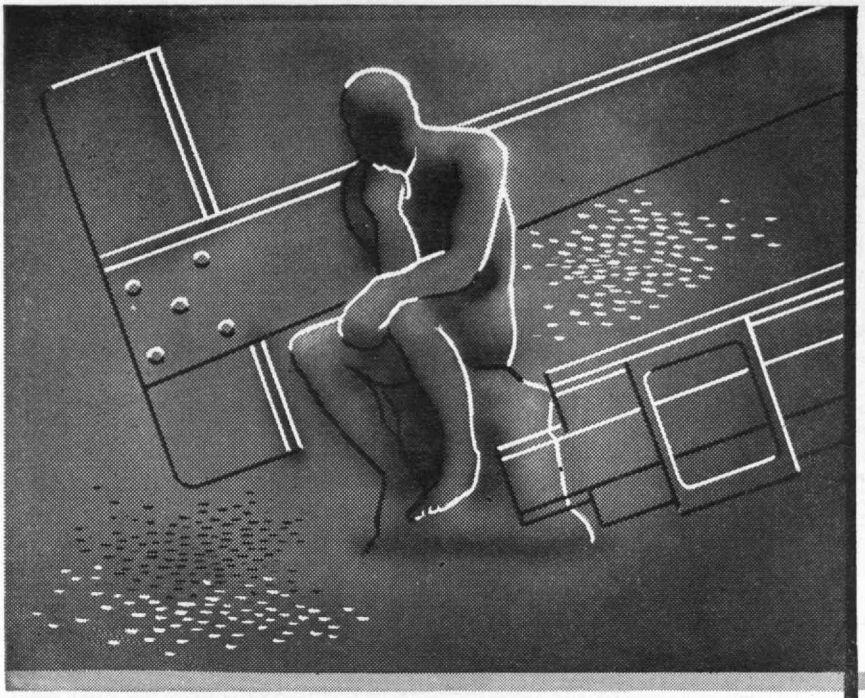
THE TABULAR VIEW

Smoke Hole. — This month marks the centennial of the first construction of the Hoosac Tunnel which our grandfathers planned in order to bring the industrialized northeast section of the country into commercial contact with the rapidly growing West. The drilling of the tunnel, through five miles of rock, presented an unusual challenge to engineers of the middle Nineteenth Century, but out of the 25 years of construction effort, there emerged newer and safer engineering practices of great importance. The saga of this engineering feat is ably recorded (page 141) for The Review by E. H. CAMERON, '13, whose articles on the historical aspects of engineering ventures have become well known to Review readers during the past five years. Mr. Cameron is head of the Technical Publications Division of Jackson and Moreland, well-known Boston firm of consulting engineers. Mr. Cameron's professional activities have been entirely in the field of civil engineering, and embrace projects in New England, the Middle West, and Southwest. They include the design of bridge construction details, and engineering supervision of various factory enterprises, flood-protection work, and steam systems.

Ship Hulls. — The fundamental unchangeability of ship hulls throughout the ages is emphasized (page 147) by WILLY LEY, editorial associate of The Review since 1944, and writer on a wide variety of technological topics. Mr. Ley's present study surveys a few unusual designs which have aimed to increase some desirable property of ships — usually their stability — and shows that radical departures from traditional ship shape have usually been found lacking. At any rate, there appear to be few cases on record where drastic modifications of hull design found use over an extended time. Mr. Ley has been engaged in several years of research activity at the Washington Institute of Technology during World War II, but his primary interest is interpreting science through his writings.

Society's Headaches. —The accelerated pace at which technological progress alters our way of living is discussed (page 150) by PAUL MEADOWS, Associate Professor of Sociology at the University of Nebraska, and during the past several years a frequent contributor to The Review on the social aspects of technology. Professor Meadows shows the interrelationships between invention and society's need to adapt itself to the changed conditions which important discoveries bring about. It is not the technological change which causes society's headaches so much as the rate at which invention proceeds that makes it difficult for society to alter its thinking and mode of life with sufficient rapidity to keep up with technological advance. Professor Meadows was a research associate in a Rockefeller Foundation research project in the humanities. He received his doctorate from Northwestern University in 1940, and since then has been teaching sociology, with a major interest in the human aspects of modern industrialism.



Thinking of improving

"Improving" any machine really means increasing its productive capacity. That means tinkering with speeds and weights and strength—ending up with alloy steels.

Which alloy steel?—the one that meets physical requirements at the lowest cost. Molybdenum steels fill that bill. Good hardenability, plus freedom from temper brittleness, plus reasonable price enable them to do it.

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MAIL RETURNS

Covered Bridges

FROM GEORGE H. BURT, '20:

I was interested in reading the article in The Review (December, 1950, page 83) in regard to covered bridges in New England, most of which seem to have been built 100 to 125 years ago. After I left Boston last June, I drove up through Maine, northern New Hampshire, and Vermont and happened to cross several covered bridges.

During my childhood here in the Middle West I had occasion to see several of the old-time covered bridges here which long since are gone, and I remember the story told to me at the time — that the reason for enclosing the bridges was primarily to prevent exposure to attack by Indians, rather than to give protection against weather, or to provide an enclosure for town meetings, as suggested in The Review article.

Since June I have tried to verify this history of the reason for the covered bridge and have been unable to find any explanation of the "why" of the covered bridge.

My observations last summer confirmed my previous recollections that the covering contributes no structural strength. The explanation given in The Review, that it offered a place for town meetings, as well as a convenient polling mechanism, would not seem to justify the use of the additional building lumber required; nor does it seem reasonable that in 1835 the populous was so poorly clothed or that the exposure to the elements in crossing an open bridge, as compared to the wooded areas on either side, would be such a hardship as to invite any consideration of the additional cost of such a structure.

The question has aroused my curiosity, and perhaps I may be able to arouse yours to the same extent so that you can find the answer and advise me.
Flossmoor, Ill.

[*Although the old covered bridges present a certain picturesqueness for today's generation, it may be that that quality was founded on practicability. There must have been good reason for adopting a style so uniform in the numerous covered bridges, and the one that the editor has heard most often is that these hooded coverings provided good protection for the flooring of the structure against the elements. — Ed.*]