February 1947

TECHNOLOGY REVIEW

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FOR LOWER COSTS AT POINTS OF ASSEMBLY

Use Forgings!

THE HARVEY

METAL CORPORATION

HAROLD B. HARVEY '05 • *Engineers & Manufacturers* • SHERRY O'BRIEN '17

74th STREET and ASHLAND AVENUE • CHICAGO 36, ILLINOIS

FORGINGS IN ALUMINUM • BRASS • BRONZE • COPPER • MAGNESIUM • MONEL • ALLOYS

MACHINING FACILITIES

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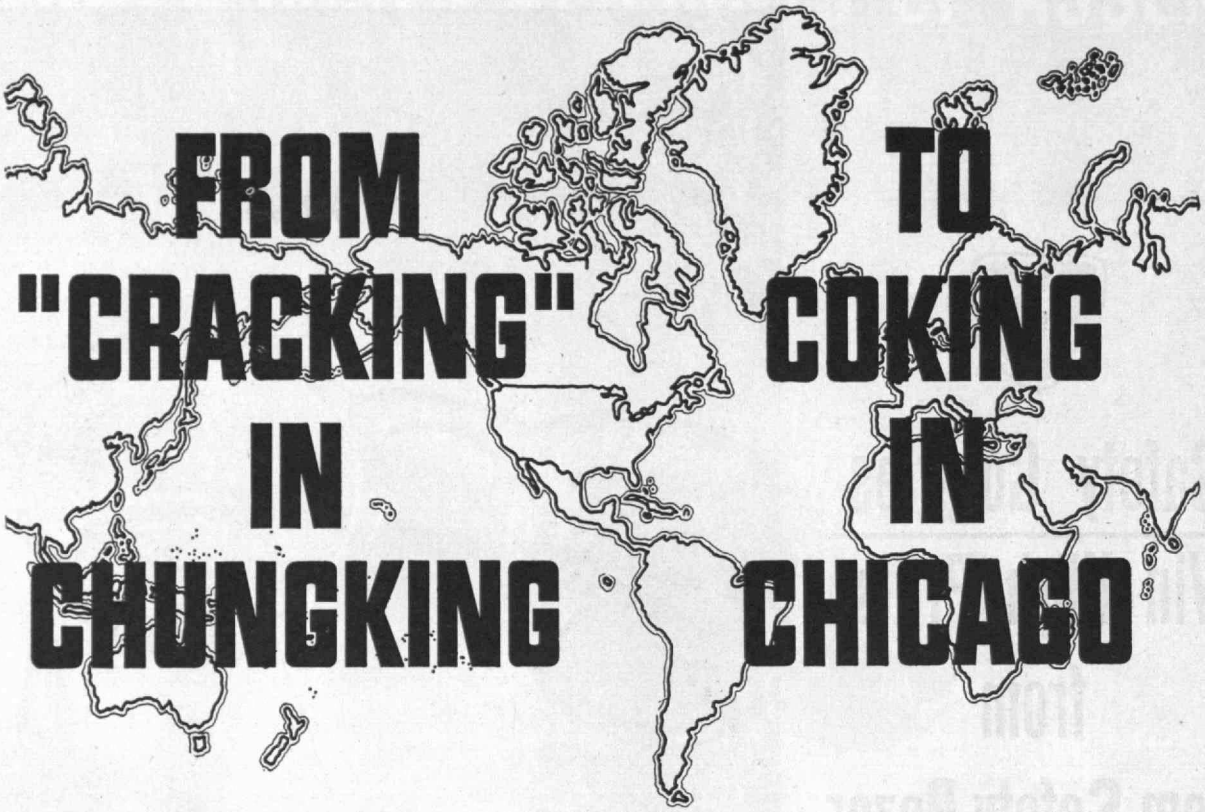


...LUMMUS has acquired a world of refining know-how

From here to China . . . from Venezuela to the U.S.S.R. . . . more than 600 Lummus-built petroleum and chemical plants are delivering high yields of high-quality products. In designing, constructing, and supervising the initial operation of all these plants, Lummus literally has acquired a world of practical experience in every phase of petroleum refining.

Many Lummus-built plants have established records for *long initial runs* – the forerunners of *outstanding performance in the long run.*

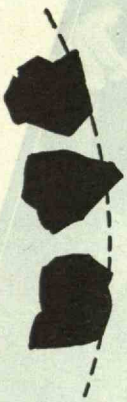
Whatever direction your refinery plans are taking, Lummus has the know-how – plus the laboratory, pilot-plant, engineering, and construction facilities – to help translate them into profits. Lummus engineers will appreciate an opportunity to discuss the desirability of studying your refinery, to determine what modernization or expansion will be necessary to meet tomorrow's market requirements.

THE LUMMUS COMPANY
420 Lexington Avenue, New York 17, N. Y.
CHICAGO – 600 South Michigan Avenue, Chicago 5, Illinois
HOUSTON – Mellie Esperson Building, Houston 2, Texas
LONDON – 78 Mount Street, London, W. 1, England

Lummus
PETROLEUM REFINING PLANTS

Here's Why

32 ALUNDUM Grinding Wheels Are Showing Such Startling Results



When ordinary abrasives are crushed to size it results in many grains with flat sides. When such grains are bonded into a wheel it is often a flat side that is exposed in the surface instead of a useful cutting point.

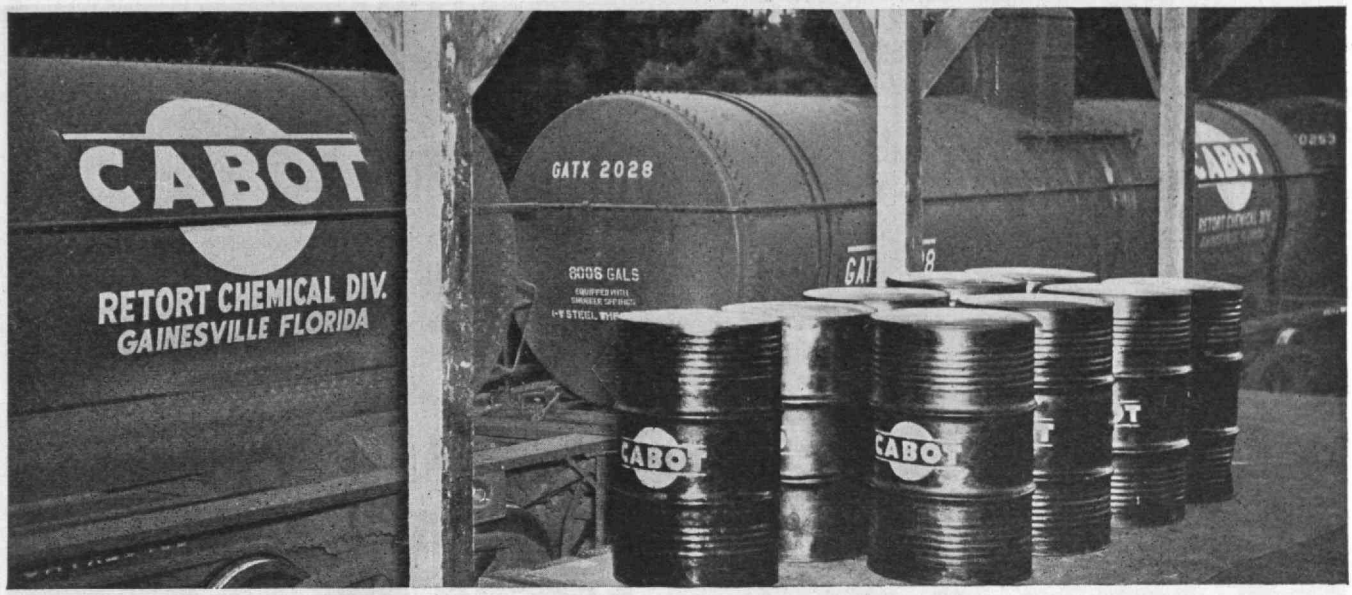
No crushing to size is necessary, however, with 32 ALUNDUM abrasive. The grains form as individual crystals—pointed *on all sides.* No matter how they are bonded into a wheel one or more cutting points are exposed. And they are longer-lasting cutting points because they are over 99% pure fused alumina.

The greater number of longer-lasting cutting points doing the work means that a 32 ALUNDUM grinding wheel removes stock more rapidly. Because grinding heat is spread over more points, and points that stay sharp longer, "32" wheels cut cooler. Because there are more points doing the work and points that don't dull quickly, 32 ALUNDUM wheels require fewer dressings and last longer.

Ask your Norton abrasive engineer for Vectograph Demonstration

Norton Company, Worcester 6, Mass.

NORTON ABRASIVES



FOR INDUSTRY

Raw materials of the Cabot Companies meet many essential needs of industry.

The Retort Chemical Division of the Cabot Carbon Company is an example. In Florida, Retort takes the stumps of the timberlands and extracts pine tar, an essential in rubber compounds and a protective coating on cordage both ashore and on the nets of our fishing fleets.

The charcoal is used in the molds of the metallurgical industry.

Cabot Companies utilize many other natural resources which might otherwise be wasted. In the oil fields, so-called "sour" natural gas, with a high sulphur content, first is stripped of natural gasoline to enrich the nation's motor fuel. Then the gas is burned in Cabot plants to manufacture carbon black for rubber, paints, varnishes, lacquers, inks and plastics.

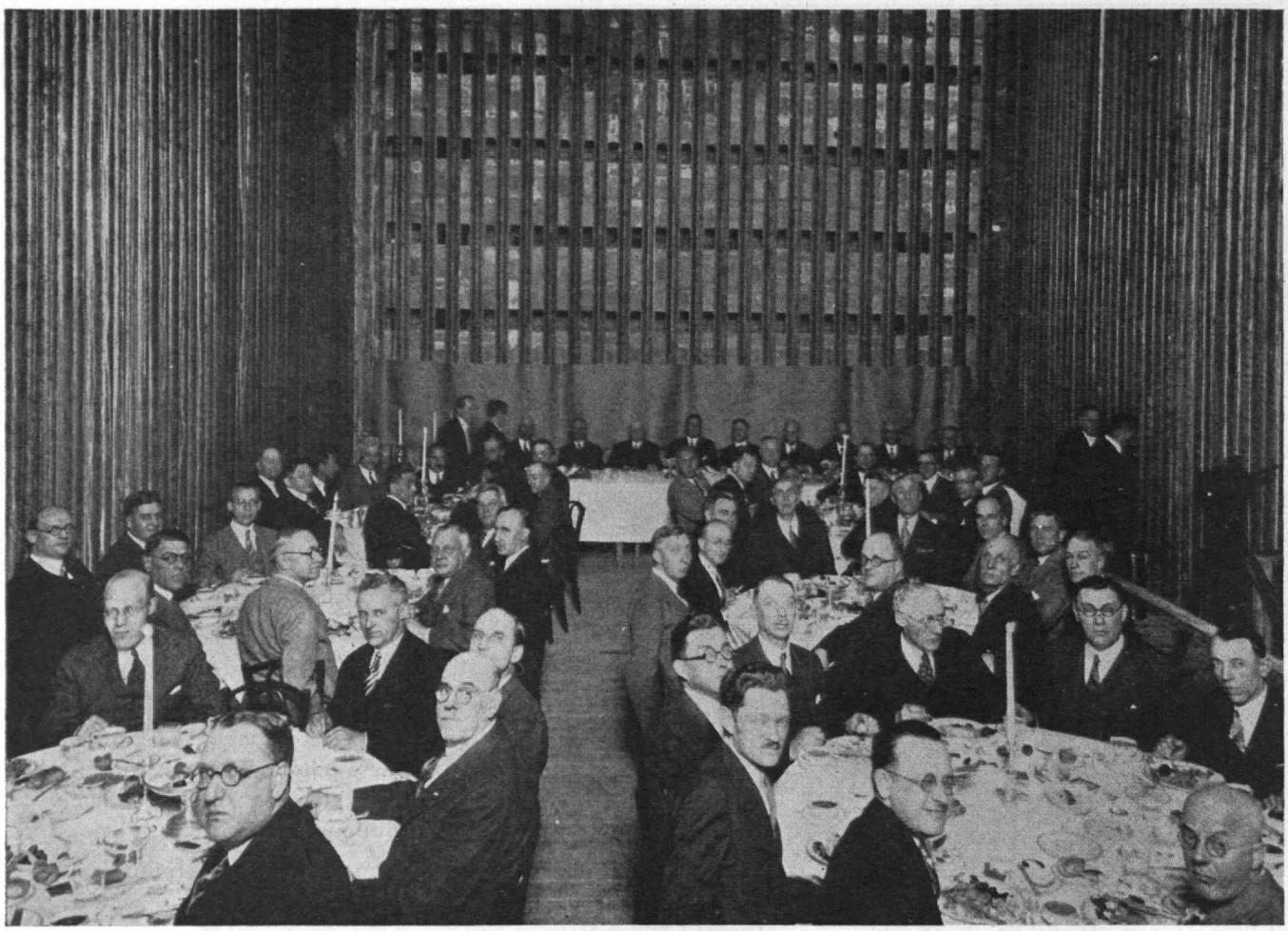
Carbon Black
Natural Gas
Natural Gasoline
Pumping Equipment
Pine Tar
Charcoal
Carotene
Chlorophyl

CABOT CARBON CO.
TEXAS ELF CARBON CO.
GENERAL ATLAS CARBON CO.
CABOT SHOPS, INC.
VALLEY VITAMINS, INC.

CABOT

GODFREY L. CABOT, INC.

77 FRANKLIN STREET · BOSTON 10, MASS.



WORLD'S FIRST *million-pound boiler!*

At noon on December 2, 1929, ninety people lunched in a room which a few hours later had an average temperature of about 2500 deg. Fahr. Steel tubes formed the walls. 85 feet overhead were the dim outlines of huge drums. This improvised dining room was the furnace of the first boiler unit to produce a million pounds of steam per hour, and the luncheon celebrated the completion of three such units in the East River Station of the CONSOLIDATED EDISON COMPANY OF NEW YORK.

This unusual event marked a notable step forward in the economics of steam and power generation. A million-pound boiler costs substantially less to install and operate than two half-million pound units. Yet, until the East River installation — designed and built by Combustion Engineering — had demonstrated that a million-pound output from a single boiler was practical, there had been only one plant in the country with boilers capable of producing even half a million pounds. Now there are many installations for capacities above 500,000 pounds and, in the million-pound class, there are twelve units in service and four on order. Of these sixteen, eleven are Combustion Engineering designed.

The spectacular comparisons given below may help you to visualize a million-pound boiler, probably the biggest single production unit you'll find anywhere in industry. Combustion Engineering is proud of the engineering resources and manufacturing facilities that enabled it to build the first million-pound boiler — and a majority of those that followed it. And these same resources and facilities are available to you when you select *any* C-E Steam Generating Unit, small or large.

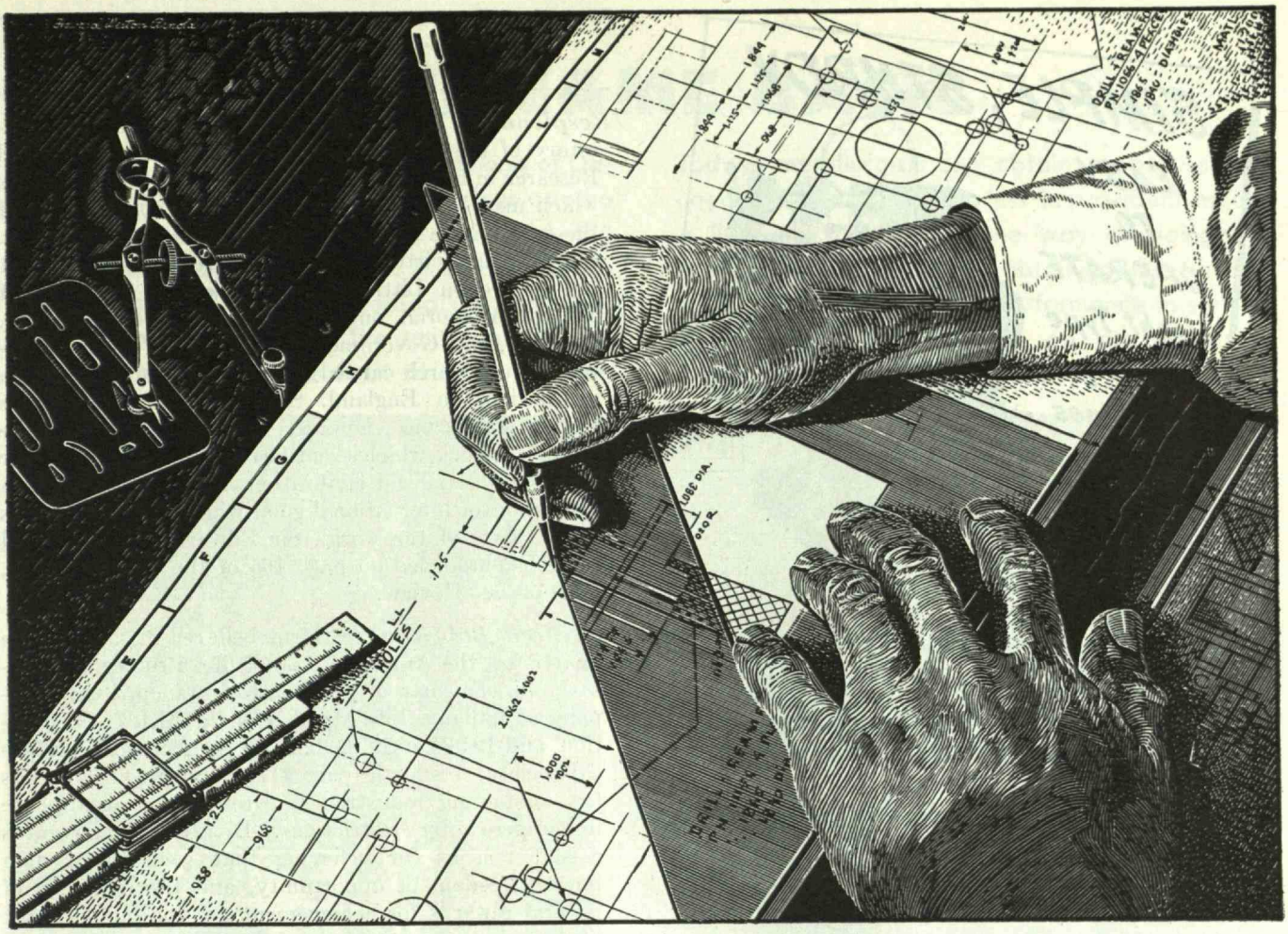
• A typical million-pound boiler is about ten stories high. • It's as wide as a four-lane highway. • The space in 5 six-room houses would just fill its furnace. • In one hour it burns 45 tons of coal, pulverized to the fineness of flour, with nearly 90 per cent efficiency. • The steam it produces would be sufficient to heat ten thousand average homes.

B-106

COMBUSTION ENGINEERING

200 Madison Avenue • New York 16, N. Y.

C-E installations cover all steam generating requirements from 30 horsepower stoker-fired boilers to the largest power station units.



EXPERIENCE ..at your Service

At American Bosch, engineering experience born of years of doing is at the service of Diesel users everywhere. Pooled with the Diesel Builders' own knowledge, this specialized fuel injection experience is at work today on the better, lighter, more efficient Diesels of the future.

Production skill and capacity which have kept pace with the industry's growth bring the engineers' work to reality. Widespread field service keeps the equipment operating efficiently.

Thus American Bosch experience serves from the conception of the engine to the product at work, which may serve to explain why a majority of America's Diesel Builders equip their engines with American Bosch Fuel Injection. AMERICAN BOSCH CORPORATION, Springfield 7, Mass.

Diesel Fuel Injection

AMERICAN BOSCH

AUTOMOTIVE AND AVIATION ELECTRICAL PRODUCTS

THE TABULAR VIEW

Resplendent Trio. — SIR EDWARD V. APPLETON, Secretary of the Department of Scientific and Industrial Research in England, emphasizes (page 211) the benefits which may be expected from the close co-operation of the triumvirate of science, industry, and government. Representing virtually the complete text of the first Arthur Dehon Little Memorial Lecture delivered at Walker Memorial on November 19, 1946, "Science, Industry, and Government" acquaints us with the co-operative research carried on by the industrial research associations in England. Sir Edward's message has further significance, however, not alone because of the important place which scientific research occupies in our highly industrialized civilization; it is significant as an expression of international good will between scientists in all parts of the world. Sir Edward's distinguished career is chronicled on page 165 of the January, 1947, issue of The Review.

Research Lubricant. — Firm believer in, and active fighter for, the American way of life, ROBERT E. WILSON, '16, chairman of the board of Standard Oil Company of Indiana, Life Member of the M.I.T. Corporation, and 1943 Perkin medalist of the American Chemical Society, sets forth (page 217) convincing arguments for conducting industrial research in an atmosphere unhampered by restrictions. Dr. Wilson advances cogent reasons for believing that well-trained man power, freedom of opportunity, and the incentive of natural rewards for achievement are the factors most likely to insure continuance of the brilliant performance of science in promoting this nation's welfare. After postponing publication until Dr. Wilson was able to present it as an address at the Princeton Bicentennial Conference, The Review is happy to bring to its readers "Incentives for Research."

Diversify to Progress. — Looking askance at systems of regimentation, and even those customs and trends tending to produce uniformity in humans, PROFESSOR HENRY B. PHILLIPS, head of the Department of Mathematics, takes up the cudgels for individualism (page 220) in "Diversity and Progress," originally given as his presidential address at the M.I.T. Chapter of Sigma Xi. As a confirmed optimist, Professor Phillips expects local diversity to provide that leadership needed for future progress. After graduation from Erskine College in 1900, Professor Phillips received his degree of doctor of philosophy from Johns Hopkins University in 1905. He has been a member of the Department of Mathematics since 1907, its head since 1935, and is well known as author of several textbooks and mathematical papers.

Proposal. — After graduation from the Baltimore Polytechnic Institute in 1935, RICHARD A. NOVAK received a degree from the Institute in 1939 as a graduate of Course XV. During 1939–1940, he was teaching fellow at St. John's College in Annapolis, and since 1940 has been in the Aircraft Gas Turbine Engineering Division of the General Electric Company at Lynn, Mass. His interest in writing and in cultural aspects of education are reflected (page 221) in "Humanities in an Engineering School."