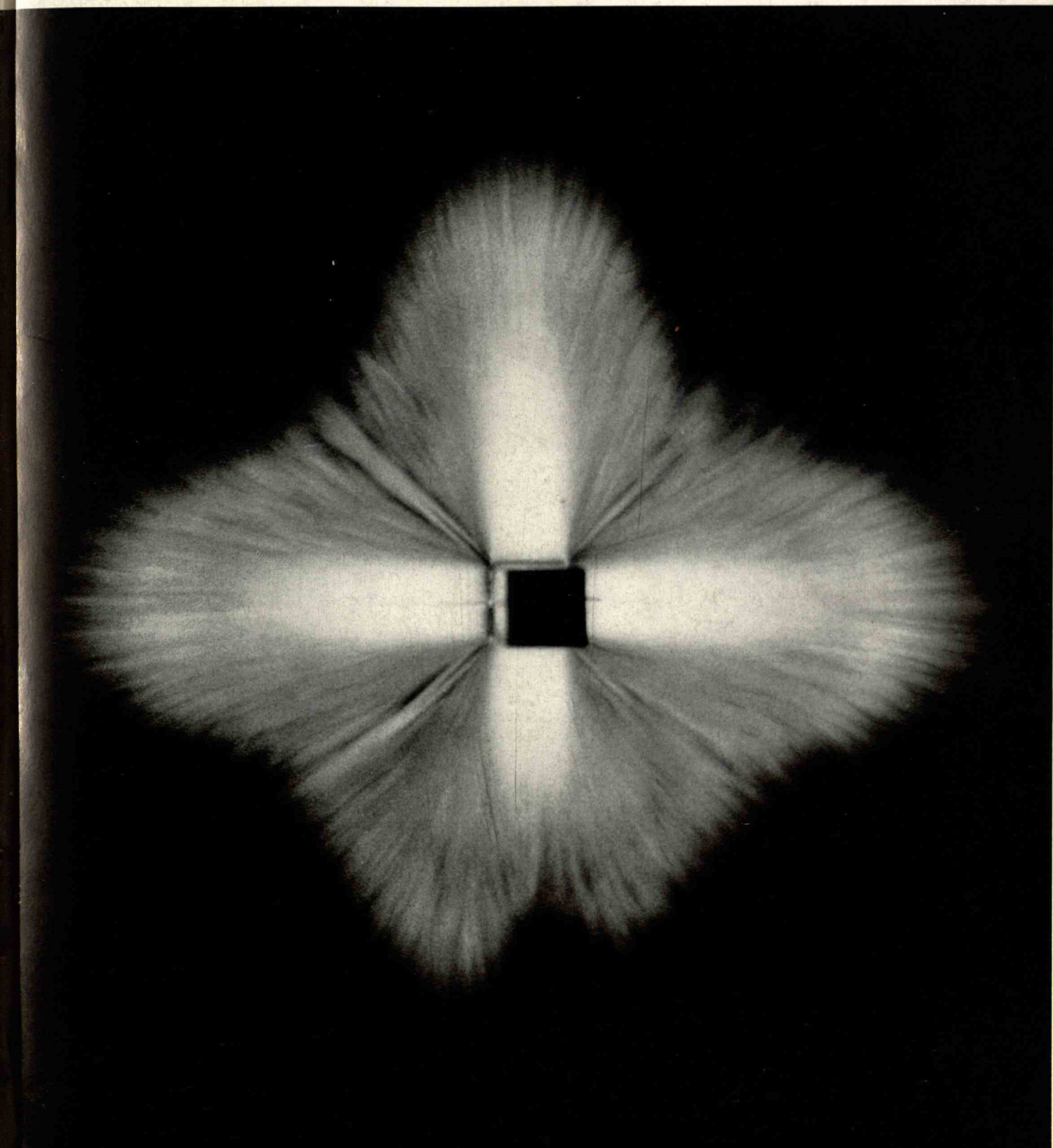
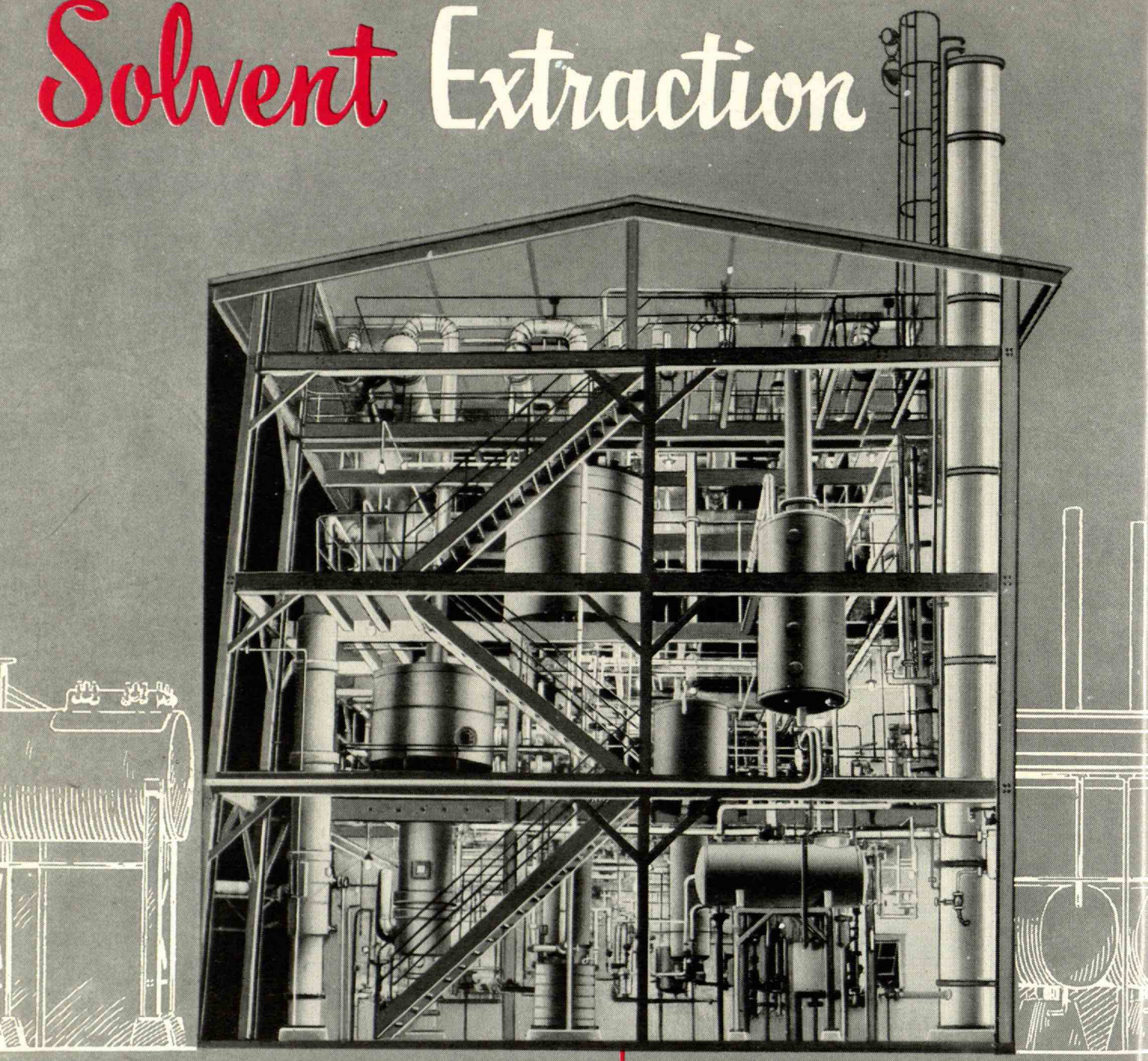
TECHNOLOGY
REVIEW
March 1952



Solvent Extraction



A complete wood rosin purification plant designed and constructed by Vulcan, using the Vulcan Solvent Extraction Process.

The Vulcan organization is at your service to provide:

Technical and economic surveys • Research and development • Process and mechanical design • Equipment manufacture • Plant erection and startup

VULCAN | CINCINNATI

ENGINEERS AND MANUFACTURERS OF PROCESS PLANTS AND EQUIPMENT

The VULCAN COPPER & SUPPLY CO., *General Offices and Plant,* CINCINNATI 2, OHIO

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VICKERS VULCAN PROCESS ENGINEERING CO., LTD., MONTREAL, CANADA

ENGINEERING DIVISION • MANUFACTURING DIVISION • CONSTRUCTION DIVISION • INDUSTRIAL SUPPLY DIVISION

THE TECHNOLOGY REVIEW, March, 1952. Vol. LIV, No. 5. Published monthly from November to July inclusive at Emmett Street, Bristol, Conn. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription $3.50; Canadian and Foreign subscription, $4.00. Entered as second-class matter December 23, 1949, at the Post Office at Bristol, Conn., under the Act of March 3, 1879.

PREVIEWERS *of a*

ON DECEMBER 5, 1941, these utility engineers from all parts of the country made a trip to the Somerset Station of Montaup Electric Company, Somerset, Mass., to see a new boiler . . . a radically different boiler . . . a controlled circulation boiler.

The main difference between the Montaup boiler and American power boilers of conventional design was that it employed a new and different principle of circulation. Its circulation was *controlled*. With this principle, a specially designed pump is used to maintain positive circulation throughout all parts of the boiler and the flow to each section is controlled according to its needs. Conventional, or natural, circulation boilers on the other hand, depend entirely on heat to maintain circulation and do not permit positive control of flow to different circuits.

Previously, controlled circulation had been in use commercially in Europe, but only in relatively small boilers. This was the first application in an American power station and it had the further distinction of being the first boiler to produce steam at a temperature as high as 960° F. At 2000 pounds per square inch design pressure, it was also one of the two highest pressure boilers in this country.

One major advantage of controlled circulation is that it is ideally suited to use in the higher pressure range where heat as a means of circulation becomes less effective . . . and it is in this higher pressure range — from 2000 pounds per square inch up — that higher overall plant efficiencies can be achieved. There are, of course, collateral advantages such as:

- **substantial reduction in weight made possible by the use of small-diameter, thin-wall tubes;**
- **new flexibility in proportioning boilers to fit existing space;**
- **quicker starting up and shutting down;**
- **maximum number of service hours per year.**

The drastic departure from conventional practice at Montaup — which these engineers came to see — required pioneering courage as well as engineering competence of a high order to solve the many technical problems. That

Major Development in Power Generation

Combustion Engineering—Superheater, designers and builders of the boiler, the Montaup Electric Company and the consulting engineers, Stone & Webster Engineering Corporation solved these problems has been demonstrated by the boiler's highly successful performance record over a period of years. Moreover, the proven advantages of controlled circulation have so impressed leading utility companies that they have placed orders with Combustion in the past 18 months (see list at right) representing a total investment of more than 50 million dollars. Orders have also been received from the U. S. Navy for C-E Controlled Circulation Boilers to power two destroyers of an advanced design.

• • •

The development of the Controlled Circulation Boiler is another example of Combustion's design leadership in the field of steam generation... leadership that makes it worth your while to consider C-E Boilers for your steam requirements whether large or small... utility or industrial... power or process. B-533

Utility companies that have C-E Controlled Circulation Boilers on Order

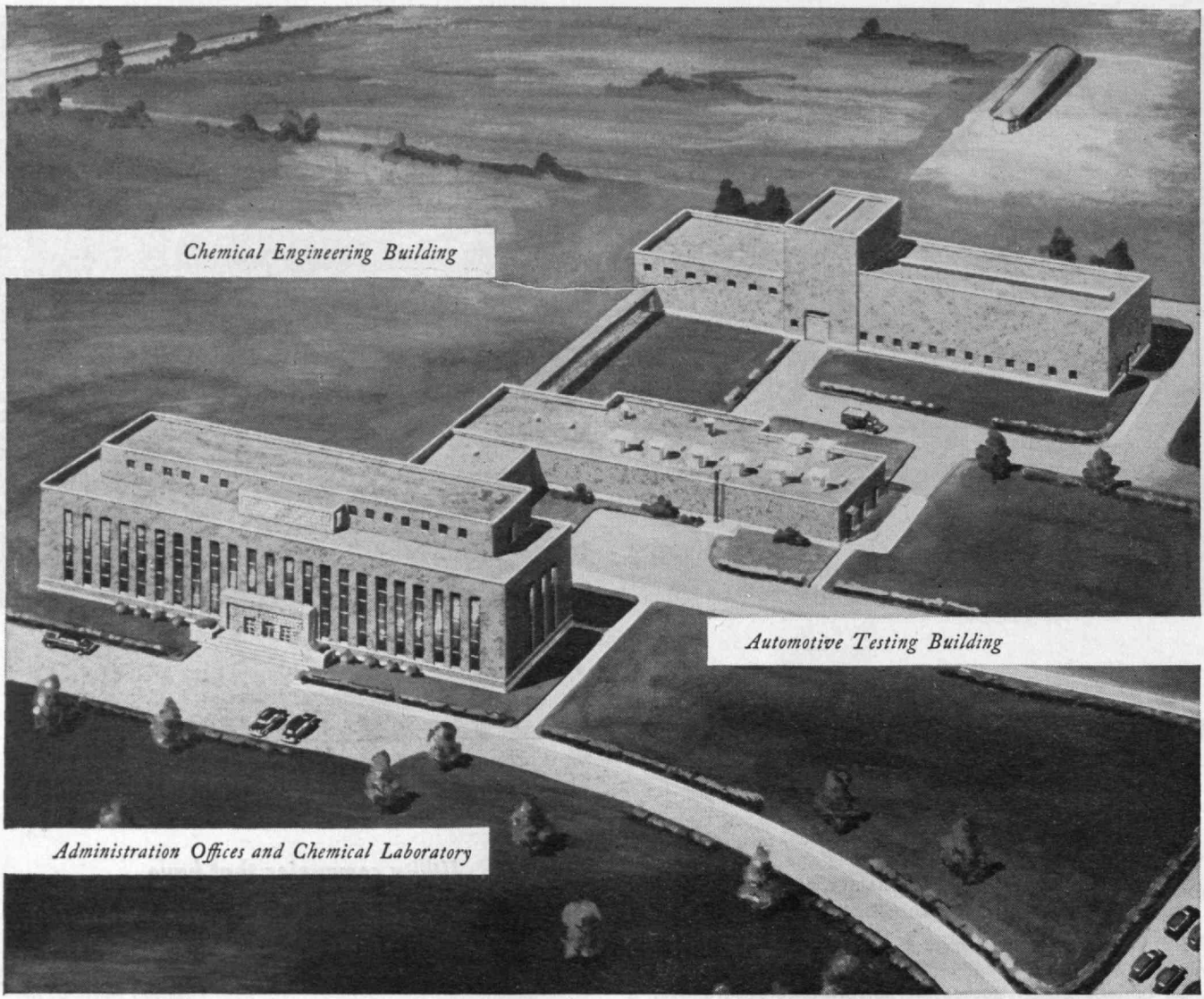
Contracts cover a total of 18 units to serve an aggregate turbine capacity of 2,500,000 Kilowatts. Design pressures range up to 2650 pounds per square inch.

Company	Plant Location	Capacity per unit lbs. of steam per hr.
Cleveland Electric Illuminating Co.	East Lake, Ohio	875,000
Consumers Power Company	Essexville, Mich.	1,050,000
Duke Power Company	Spencer, N. C.	900,000
Philadelphia Electric Company	Chester County, Pa.	1,450,000
Public Service Electric & Gas Co.	Kearny, N. J.	1,015,000
Southern California Edison Co.	Etiwanda, Calif.	920,000
Virginia Electric & Power Co.	Wheelwright, Va.	750,000
	Gilmerton, Va.	750,000
Wisconsin Electric Power Co.	Milwaukee, Wis.	795,000

—SUPERHEATER, INC.

Combustion Engineering Building • 200 Madison Avenue • New York 16, N. Y.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT

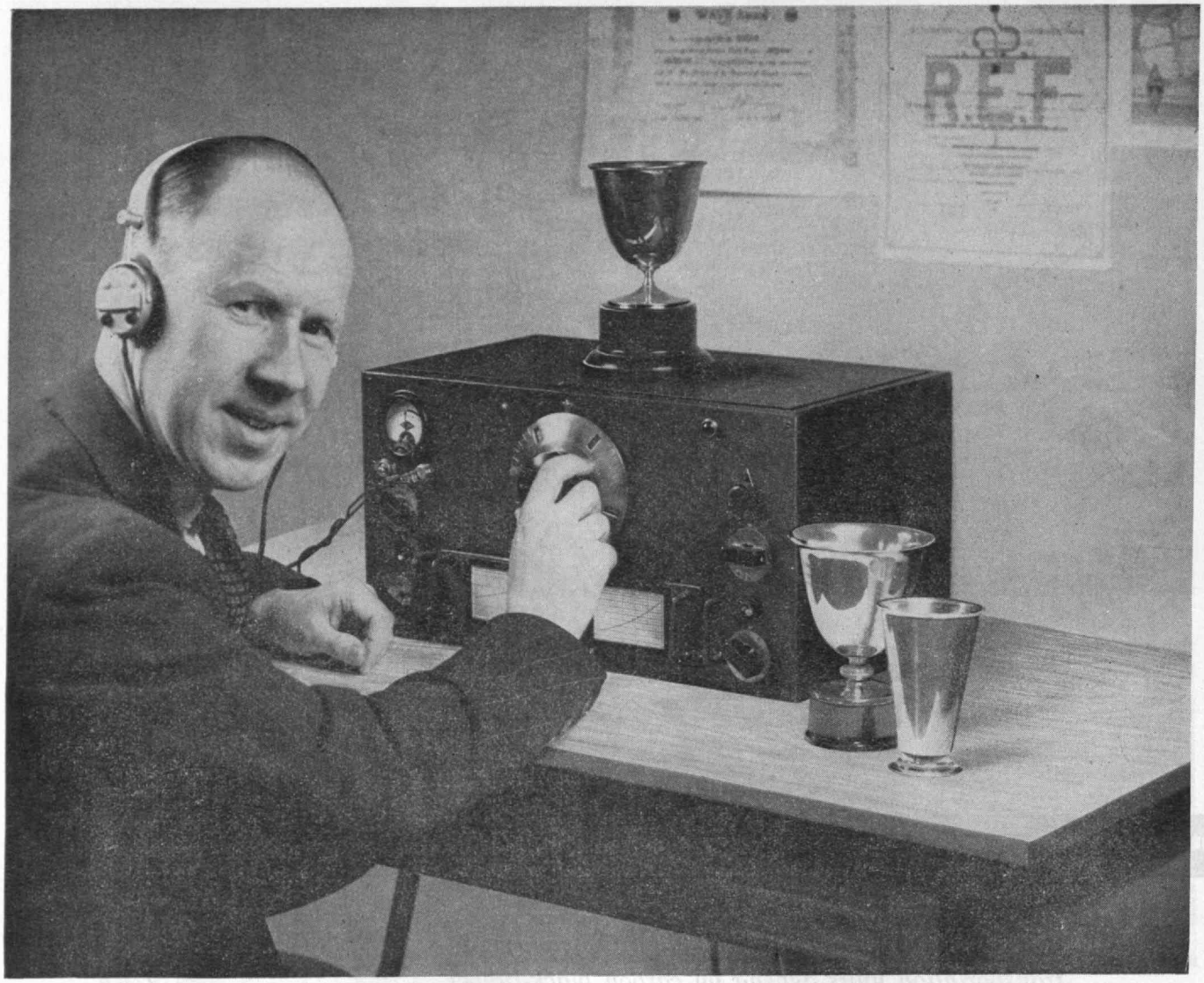


Crystal Lake
LABORATORY

When Pure Oil Company considered building a Research and Development Laboratory at Crystal Lake, Illinois, Stone & Webster Engineering Corporation was engaged to make preliminary studies and estimates. It later designed and furnished engineering supervision during the construction of the project.

STONE & WEBSTER ENGINEERING CORPORATION

A SUBSIDIARY *of* STONE & WEBSTER, INC.



17 Years of Prize-Winning Performance

To paraphrase a well-known quotation,
"Old HRO's never die!" Nor, may we hasten to add, do they "fade away."

In 1934, the year he got his amateur license, Gerard de Buren, HB9AW (Geneva), FP8AW (St. Pierre and Miquelon), purchased an HRO. He's still using it with prize-winning results. In 17 years, his HRO has helped him win one amateur award after another. Just this year, on St. Pierre and Miquelon Islands, he worked 1285 stations in 53 countries in 35 days!

Enduring performance like this is built into every National product.

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THE TABULAR VIEW

Future. — Uncertainty accompanies any prophecy, but forecasts of events which may be expected to occur as much as a quarter of a century in the future are in a particularly precarious state. That the role of prophet is an unenviable one is clearly recognized by PROFESSOR JOHN B. WILBUR, '26, whose imaginative vision enables him to discern (page 235) what may be in store for us two or three decades hence, as the result of progress in civil engineering. Although second only to military engineering in seniority, civil engineering is not the quiescent, staid branch of applied science which many suppose it to have become because of age. As a matter of fact, as Professor Wilbur points out, fundamental research now in progress in this field brings to civil engineering a new vitality and activity which is nonetheless significant even if not too widely recognized. As consulting engineer with Fay, Spofford, and Thorndike, of Boston, in addition to his post as Head of the Department of Civil and Sanitary Engineering at M.I.T., Professor Wilbur is eminently qualified to discuss trends in civil engineering. He holds three degrees from the Institute and since 1930 has trod the traditional academic steps from instructor to head of a Department at M.I.T. Dr. Wilbur's article represents the text of an address given before members of the student branch of the American Society of Civil Engineers. The informal, somewhat humorous vein in which the article is written embraces a good deal of sagacity presented as coming from the mouths of alert Faculty members. Illustrations for this article are from the drawing board of Henry B. Kane, '24.

Past. — The steady march of daily progress occurs so gradually that it is only in retrospect that significant changes come into true focus. We have been witnessing the tearing up of streetcar tracks for many years now without being much concerned about the social and technological changes which such action makes in our way of life. The full impact of such evolution is ably discussed (page 240) by HENRY BOWEN BRAINERD, born in Wellesley in 1907, graduated from Harvard in 1929, and now a staff member of the Institute's Instrumentation Laboratory where he is working primarily on problems of applied mathematics. Mr. Brainerd's hobby is streetcar railroading and, with the love of a true amateur, he has served (from 1940–1951) as chief engineer, and is now vice-president of the New England Electric Railway Historical Society. At Kennebunkport, Maine, this active and ambitious organization is building an operating museum of trolley cars, called the Seashore Electric Railway. It is from his all-absorbing avocation – and from co-operating members of the N.E.E.R.H.S. – that Mr. Brainerd obtained the material for his historical survey of streetcar transportation, including the timetables, maps, fare data, and local coloring mentioned in the imaginary trip from Needham to West Brookfield, Mass. All aboard! Ding! Ding!

(Concluded on page 226)