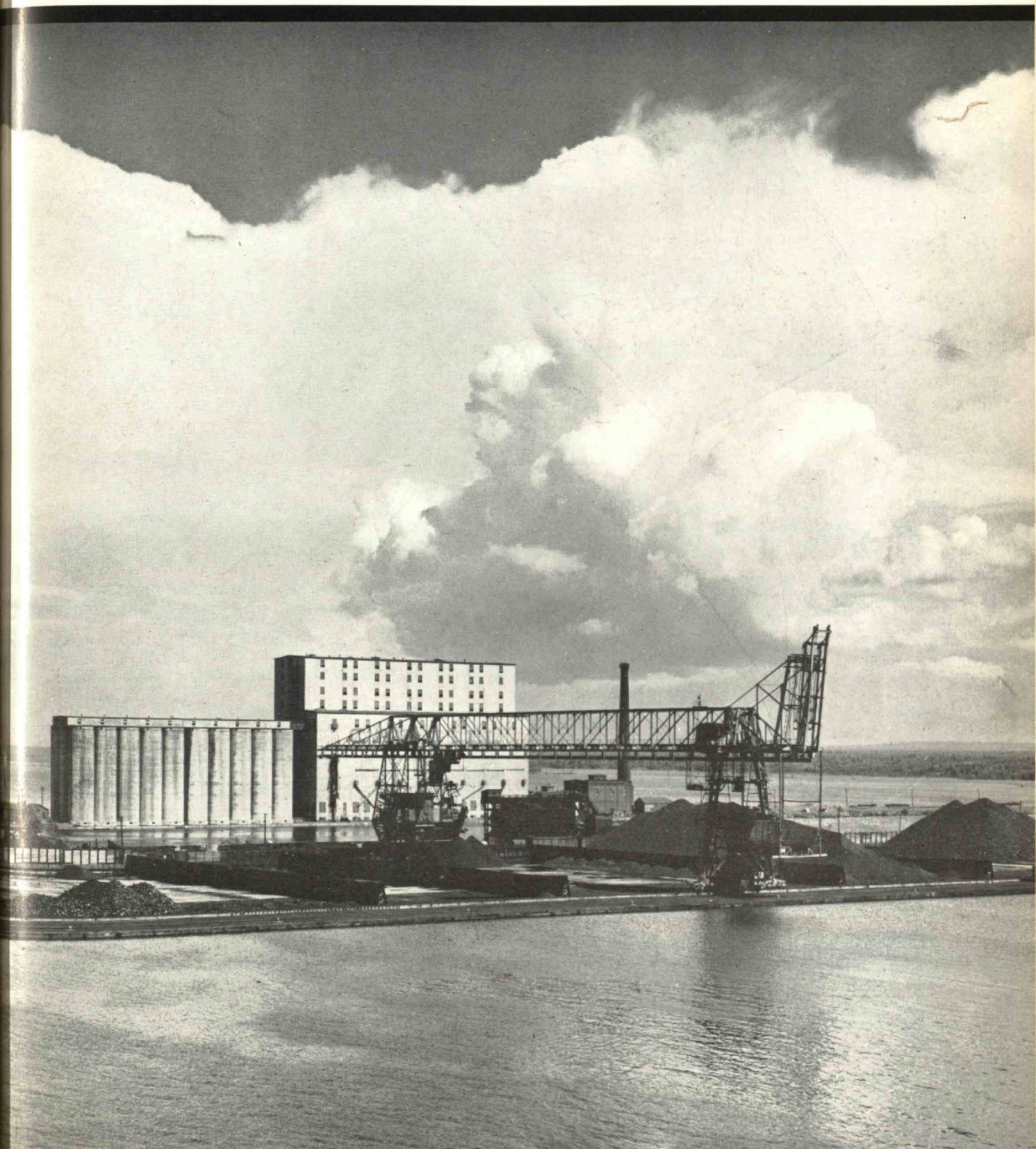
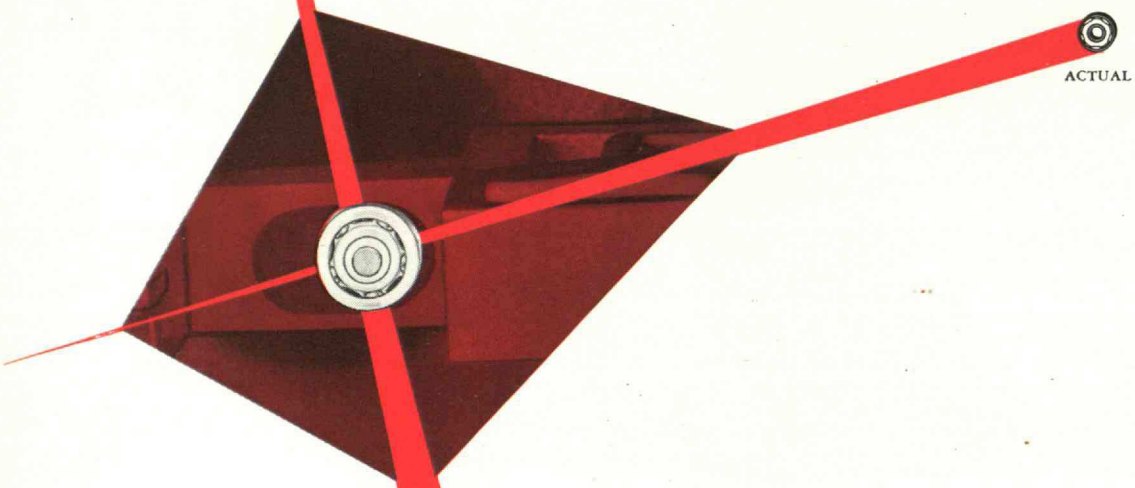
TECHNOLOGY REVIEW

June 1954

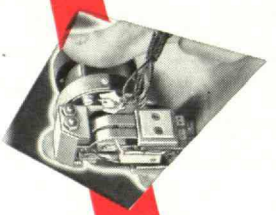


HERE'S HOW KETAY FIRE CONTROL RELAYS keep naval guns "ON TARGET" ...with MPB bearings



ACTUAL SIZE MPB 3C

accurate concentricity of miniature bearing roller guides increases relay sensitivity and dependability



Fire control relay designed and manufactured by Ketay Manufacturing Corporation of New York.

OPERATING CONDITIONS — maximum sensitivity and consistency of response depend on free-rolling, concentrically accurate bearings . bearings serve as rollers and guides for rotating armature shaft which is displaced right and left to close desired circuits . . . unit actuated by 3 to 40 volts. CRITICAL — low-friction bearing rotation . . . ability to withstand 2,000 ft.-lbs. shock (equal to recoil of 16 in. naval guns), plus temperature changes from −55° C to +71° C . . . long wear and attention-free bearing operation. RESOLVED — by use of MPB No. 3C, radial retainer bearing.

In any problem involving miniaturization of precision mechanisms, when accuracy and dependability are essential, it pays to specify MPB miniature ball bearings. Each MPB bearing is the product of exclusive production processes, designed to hold ultra-precise tolerances . . . give long, trouble-free operation.

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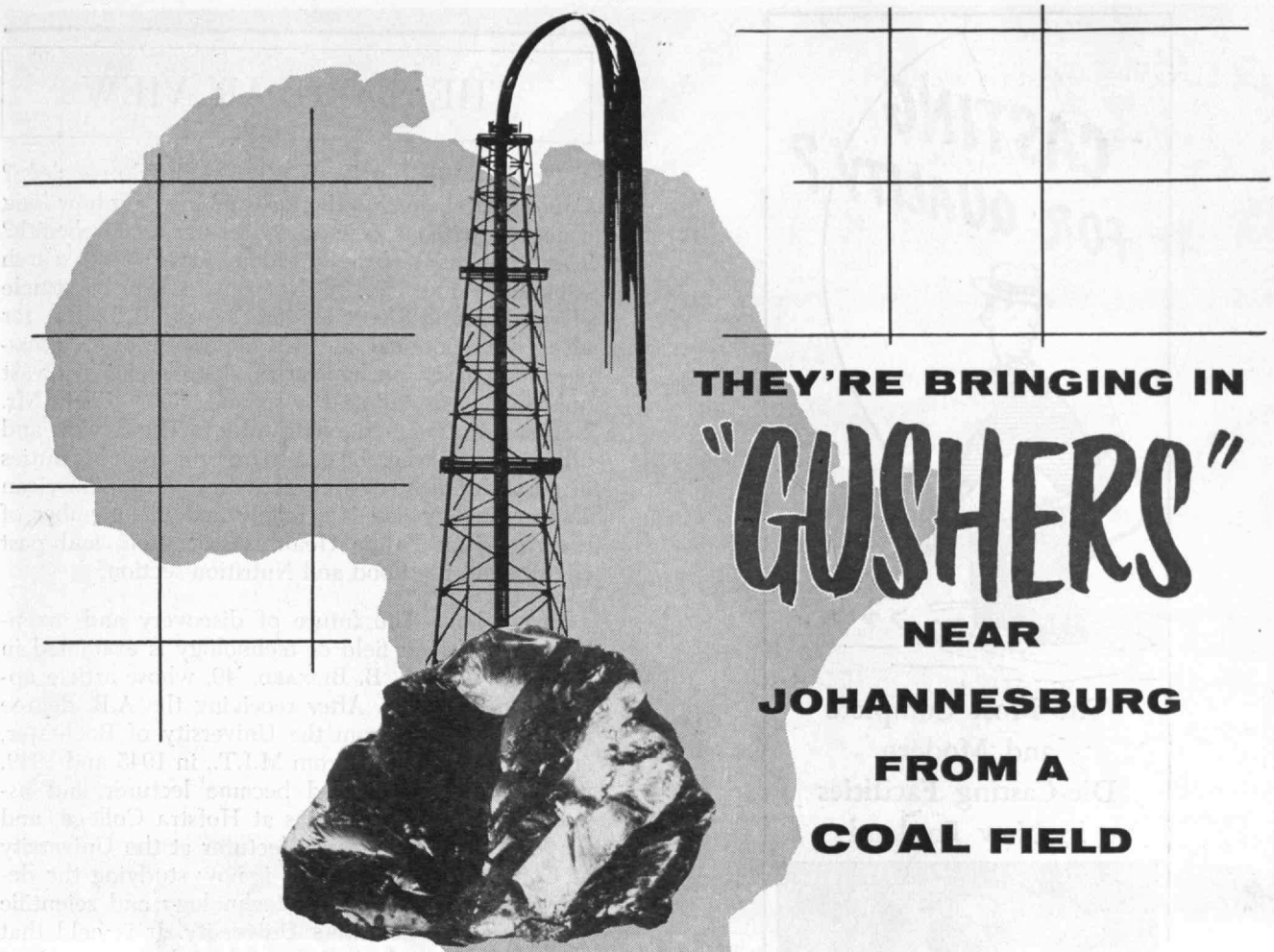

THEY'RE BRINGING IN "GUSHERS" NEAR JOHANNESBURG FROM A COAL FIELD

South Africa—land of gold and diamonds and uranium . . . of copper, tin and coal—is one of the world's greatest storehouses of mineral wealth.

But nature neglected to provide a twentieth-century reservoir of petroleum in this remote, oil-hungry land. And, since South Africa boasts more automobiles per capita than any country other than the United States, the need for refined petroleum products is large and constant.

South Africa's first vigorous answer to the petroleum shortage will be in operation in a few months. It is the first oil-from-coal plant in Africa, and one of the largest ever built. Located fifty miles south of Johannesburg, this refinery—a project of South African Coal, Oil and Gas Corp., Ltd. (SASOL)—will convert 3,000 tons of coal daily into usable petroleum products.

The size of the SASOL project may be gauged by the size of its boilers. Furnished by Combustion Engineering, Inc., they are the largest ever erected on the African continent, and include all that's latest and best in boiler design. The four C-E Boilers—which supply all the steam needed for power, process and heat in this new plant—have a continuous generating capacity of nearly a million and a half pounds of steam per hour.

Long recognized in America for their outstanding reliability and economy, C-E Steam Generating Units in recent years have been selected for many of the most modern power installations throughout the free world.

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THE TECHNOLOGY REVIEW, June, 1954, Vol. LVI, No. 8. 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.

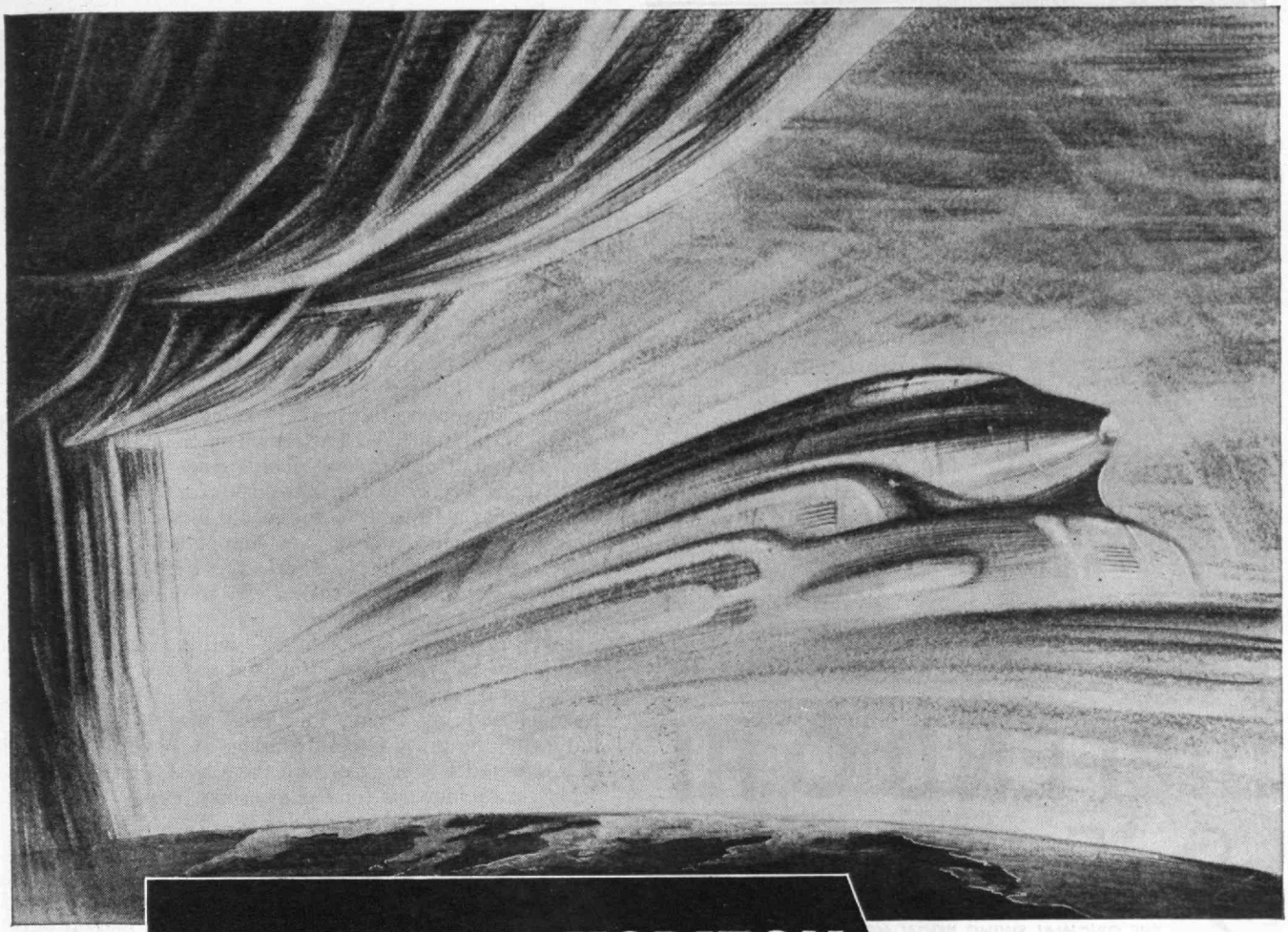
THE TABULAR VIEW

Tired. — What makes us tired? Why do we sleep? Could we get along without sleep? If so, for how long a period, without deleterious results to our health? These are some of the questions for which a search is made by FREDERIC W. NORDSIEK, '31, in his article "Tired Nature's Sweet Restorer" (page 393). But for all of the emotional and psychic effects of sleeplessness, the basic mechanism of sleep remains a vast unknown. An editorial associate since 1944, Mr. Nordsiek is a frequent contributor to The Review and other journals when he can spare time from his duties in administering research activities of the American Cancer Society. He is a fellow and life member of the American Public Health Association, and past chairman of the Food and Nutrition section.

Inventors. — The future of discovery and invention in the broad field of technology is examined in this issue by J. L. B. BLIZARD, '49, whose article appears on page 395. After receiving the A.B. degree with high honors from the University of Rochester, and the Ph.D. degree from M.I.T., in 1945 and 1949, respectively, Dr. Blizard became lecturer and assistant professor of physics at Hofstra College, and for the past year has been lecturer at the University of Connecticut. Dr. Blizard is now studying the development of science and technology and scientific man power at Columbia University. It is held that overemphasis on applied research at the present time, at the expense of research in basic science, is a practice well worth serious attention.

Fish. — Following up his article on the dairy industry in the November, 1953, issue of The Review, MILTON E. PARKER, '23, devotes attention in this issue (page 401) to the sea-food industry. Professor Parker is concerned that the rate of population growth exceeds that of our food industry – at least so far as concerns protein production. He looks to the sea to provide ample bounty to our supermarkets and our pharmaceutical and nutrition industries. Professor Parker has been engaged in a wide range of activities in the food industry, becoming manager of production of the Beatrice Foods Company in 1936, and more recently, food-consulting engineer. Since 1948 he has been head of the Department of Food Engineering at the Illinois Institute of Technology.

For the Future. — PAUL COHEN, '35, former editor of *The Tech* and editorial associate of The Review since 1938, provides readers with a brief review of the growth of research activities in the United States during the past decade (page 405). Calling organized research "the generative organ of the industrial state," Mr. Cohen emphasizes that the three and three-quarter billion dollars spent for research during 1952 is truly an investment in the future. Since his graduation from the Institute's Course in Mechanical Engineering, Mr. Cohen has been a research engineer by vocation and a skillful writer and interpreter of science and engineering by avocation.



BEYOND THE HORIZON....

Designers are seeking new alloys from the metallurgist in order to develop higher speed transportation.

Higher speed calls for materials having greater strength in lighter sections, often with little or no sacrifice in toughness. Molybdenum contributes vital properties to better alloys which will certainly be developed for the future.

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MAIL RETURNS

Eloquence of Sculpture

FROM WELLES BOSWORTH, '89:

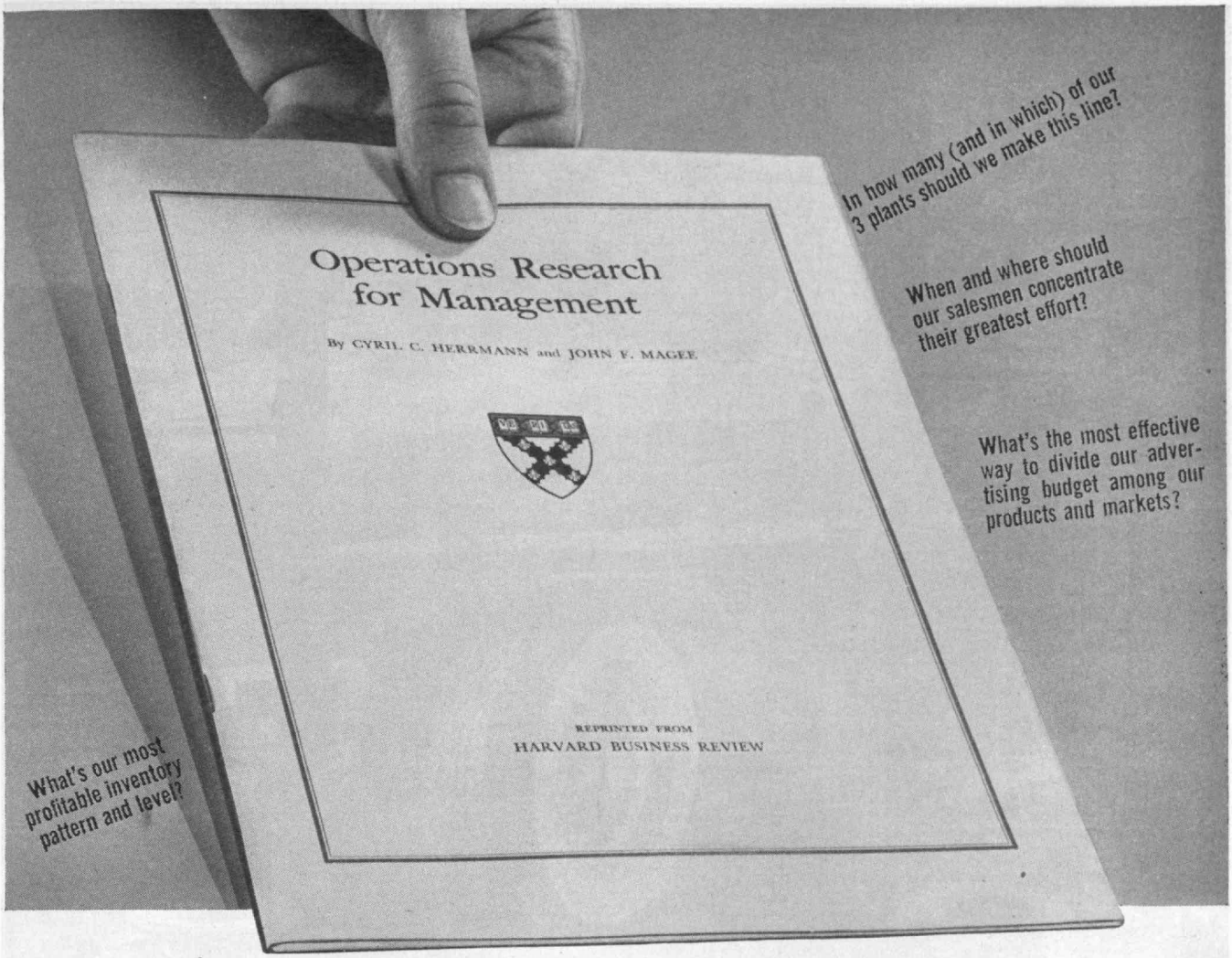
Your article about the history of the architecture of M.I.T. in the April Review has of course interested me* probably more than any other of your readers . . .

I must tell you about the Rogers Building and the statues, which those four pedestals are so patiently waiting for. I have a high regard for the eloquence of sculpture in connection with architecture. I showed on my first project for the M.I.T. group a great heroic-size statue, representing the spirit of knowledge, on the axis of the Main Court. I have shown it on every drawing and painted it on airplane photos since the beginning, and I hope keenly to see it realized, for it would be so fine there as a keynote to the whole institution, like the statue of Athene was on the Acropolis, or the Alma Mater at Columbia in New York. . . . But so far, committees always think the easiest way to cut down cost in building is leave off sculpture.

I well remember Dr. Compton's writing me asking me to describe to him how I visualized the new Rogers entrance and vestibule to M.I.T. from Massachusetts Avenue, and my telling him there ought to be four statues of the great Greek founders of modern learning in it. He and I later agreed on them as Aristotle for the Sciences, Archimedes for Engineering, Ictinus (and Callicrates looking over his shoulder at a plan of the Parthenon) for Architecture. Seeing these statues would certainly inspire every student and teacher of M.I.T. to follow their example and hope to become "great." The pier of masonry back of each statue was to bear incised outlines illustrating their inventions, like the water screw of Archimedes and the Parthenon of Ictinus, or famous words of theirs. The cost of this sculpture was relatively small, as the statues could well be made of artificial stone cut from plaster models. What fine memorials these would make, for distinguished M.I.T. graduates. The idea must be continually kept alive, and I hope you may find a way of bringing it somehow into print where the Alumni will see it.

Vaucresson, Seine et Oise, France

* [Mr. Bosworth is the architect of the main group of M.I.T. Buildings erected in Cambridge in 1916.—Ed.]



New Concept Simplifies Business Decisions

Management now has a new way to attack business problems . . . operations research. Here are a few diverse problems it has helped to solve:

- Directing salesmen to the right accounts at the right time.
- Fitting incentive payment plans to management objectives.
- Controlling levels of purchase, production, inventory, shipment and customer service to maximize total profits.
- Dividing the advertising budget among products and markets in the most profitable way.
- Balancing quality standards and cost standards in procurement and in successive production operations to find lowest over-all costs.
- Finding and evaluating the basic purposes, elements, and costs of large clerical operations and specifying design requirements — from pen and ledger to electronic information-handling devices.

How It Works . . . Operations research makes possible these accomplishments and many others because (1) it helps single out the critical issues which require executive appraisal and analysis, and (2) it provides quantitative analyses to support and guide executive judgment. It eases the burden of effort and time on executives but increases the potential of their decision-making role. Thus operations research contributes toward better management.

A Few Case Histories . . . How does it work? How does it differ from other services to management? What are its limitations and potentials? These questions are answered in a booklet called "Operations Research for Management". You can have it by return mail. With it we'll send "A Few Case Histories", based on the experience of our pioneer operations research group working with American management since 1949. These booklets will help you to decide whether operations research can lighten your decision-making burden. Phone Boston, UNiversity 4-9370, or write:

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GOODYEAR

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Cambridge Common (May Contents page) contains the ancient cannon which was used to bombard General Gage's Army in Boston during the siege of 1775; it also contains the monument, with statue of Lincoln, as a memorial to those who died in service during the Civil War.

Raymond E. Hanson

How Well Do You Know Boston?

Believe it or not, this quiet, idyllic spot is near one of the busiest and most active business corners of Boston. The point at which the exposure was made makes the difference. Can you identify this stone building and tell where it is located? If not, see the Contents page of the July issue.

THE TECHNOLOGY REVIEW

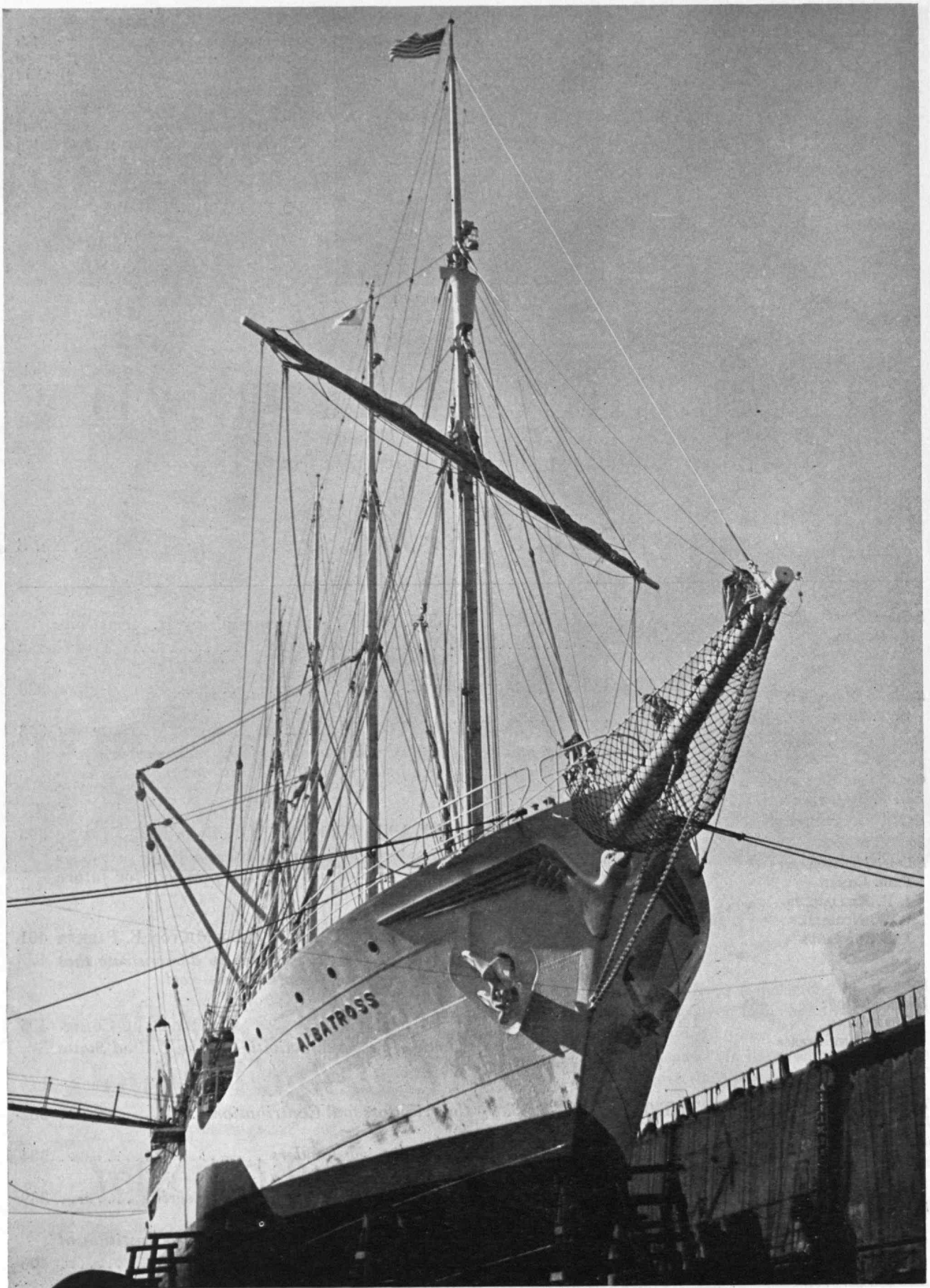
TITLE REGISTERED, U. S. PATENT OFFICE

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CONTENTS *for June, 1954*

Vol. 56, No. 8

Published monthly from November to July inclusive on the twenty-seventh of the month preceding the date of issue, at 50 cents a copy. Annual subscription, $3.50; Canadian and foreign subscription, $4.00. Published for the Alumni Association of the M.I.T.: Horatio L. Bond, President; H. E. Lobdell, Executive Vice-president; Dwight C. Arnold, Richard S. Morse, Vice-presidents. Donald P. Severance, Secretary-Treasurer. Published at Hildreth Press, Inc., Bristol, Conn. Editorial Office, Room 1-281, Massachusetts Institute of Technology, Cambridge 39, Mass. Entered as second-class mail matter at the Post Office at Bristol, Conn. Copyrighted, 1954, by the Alumni Association of the Massachusetts Institute of Technology. Three weeks must be allowed to effect change of address, for which both old and new addresses should be given.



C. E. Patch, '02

Albatross

American merchant sailing vessels, once proudly sweeping the seas for whale oil, may play an important role in feeding the nation's rapidly expanding population.