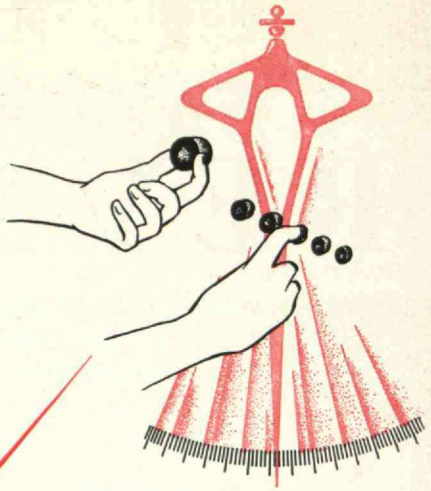
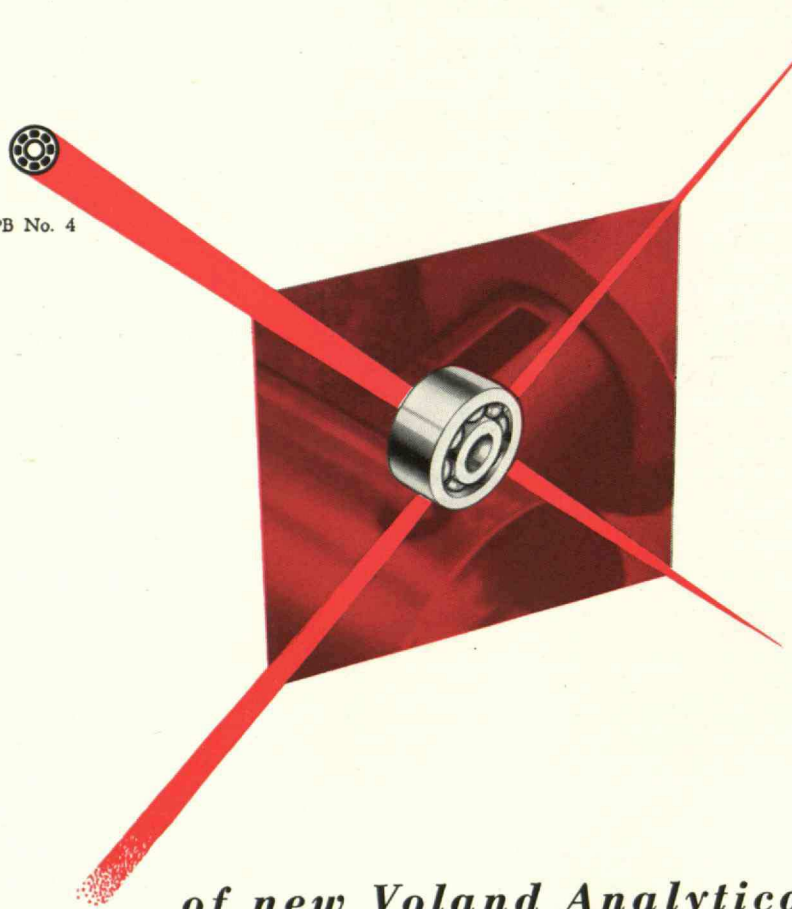
TECHNOLOGY REVIEW

January 1955

HOW MPB bearings improve performance



ACTUAL SIZE MPB No. 4



of new Voland Analytical Balance

OPERATING CONDITIONS: MPB bearing serves as anti-friction cam follower on manually operated arrestment control shaft . . . bearing transmits precise action, produces natural "operational feel" CRITICAL: reduced friction . accurate bearing concentricity which permits close, accurate alignment of mating parts. RESOLVED: by use of MPB No. 4 Radial Ball Bearing.

Use of MPB miniature ball bearings in the new Voland Analytical balance permits greater operating sensitivity than ever before possible. Bearings concentricity — critical in this application — is held to .0002 TIR. The MPB bearing used in this balance is rated to carry a radial load of over 3 lbs. at 60,000 r.p.m.

In new designs — or in improvement of existing designs — you can count on MPB bearings to provide outstanding performance, accuracy, and reliability. For full information, write on your letterhead, for MPB catalog 54.

Miniature *Precision* Bearings, Incorporated

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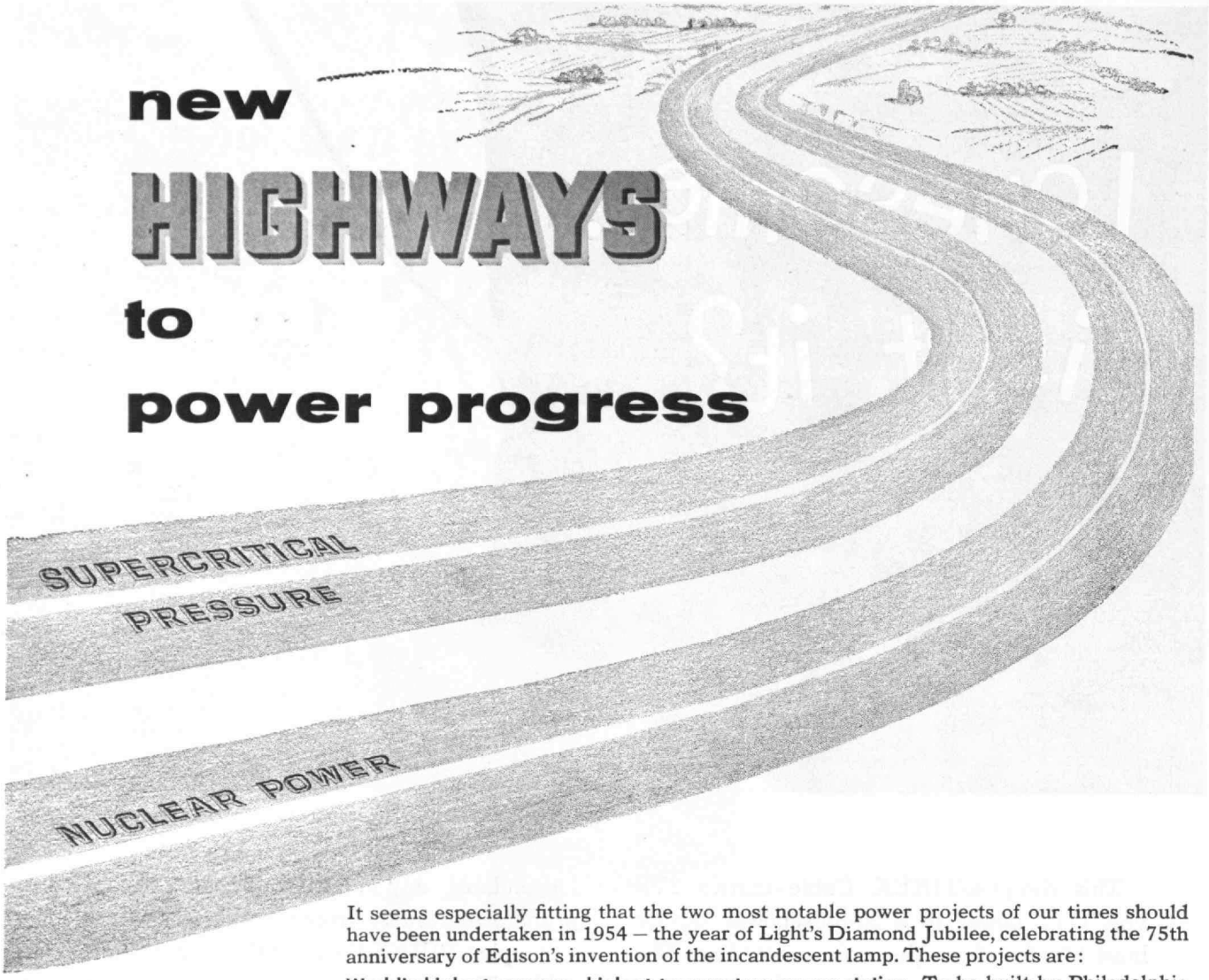

It seems especially fitting that the two most notable power projects of our times should have been undertaken in 1954 – the year of Light's Diamond Jubilee, celebrating the 75th anniversary of Edison's invention of the incandescent lamp. These projects are:

World's highest pressure, highest temperature power station. To be built by Philadelphia Electric Company, this new station will have the largest single-shaft turbine-generator ever ordered – 275,000 kilowatts. Steam will be supplied to this turbine by a Combustion Engineering boiler – a C-E Sulzer Monotube Steam Generator – designed for a steam pressure of 6000 lbs. per sq. in. (well up in the "supercritical" range) and a steam temperature of 1200° F. These record-high steam conditions will enable the new Philadelphia Electric station to generate power more efficiently than any existing or presently projected steam-electric power plant in the world.

America's first nuclear power station. To be built and operated by the Duquesne Light Company, this will be the first U. S. commercial-size nuclear power station. The heart of this plant – the giant pressure vessel that will house the reactor – will be manufactured by Combustion Engineering for the Westinghouse Electric Corporation, which has the A.E.C. contract to build the reactor. This vessel, one of the heaviest-walled vessels ever made, will contain an atomic core of more than 10 tons of enriched uranium. . . . While substantial effects of nuclear power on our economy may not be felt for the next decade or two, Combustion through its Nuclear Power Division, is carrying on extensive development in this field, looking toward the day when power from the atom will be commonplace rather than revolutionary.

• • •

The facilities that enable Combustion to play such an important part in these two most notable power projects of the new power era are available to build better boilers for your steam needs – power, process or heating – large or small.

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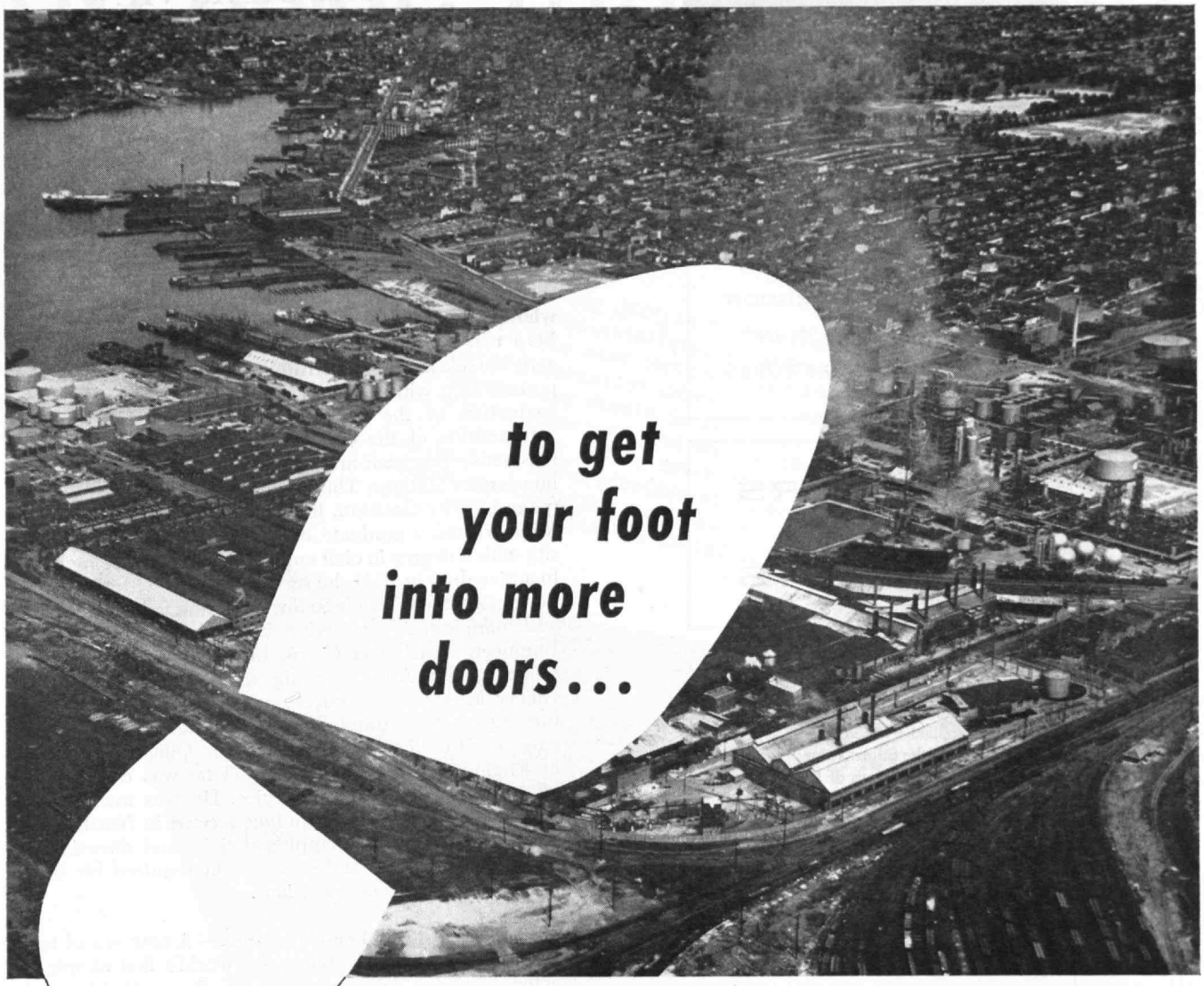

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( ) **NEW,** *almost chemically pure, extremely fine alumina pigment—Alon C. For textiles, rubber, plastics, paints, varnish, printing inks, pharmaceuticals, cosmetics, insecticides, adhesives, floor waxes.*

( ) **NEW** *thermal carbon blacks for mechanical and extruded rubber goods . . . natural rubber tubes. As the world's only manufacturer of a complete range of channel, furnace and thermal blacks, Cabot offers more than 45 different grades for use in rubber, ink, paint, varnish, lacquer, plastics and paper products.*

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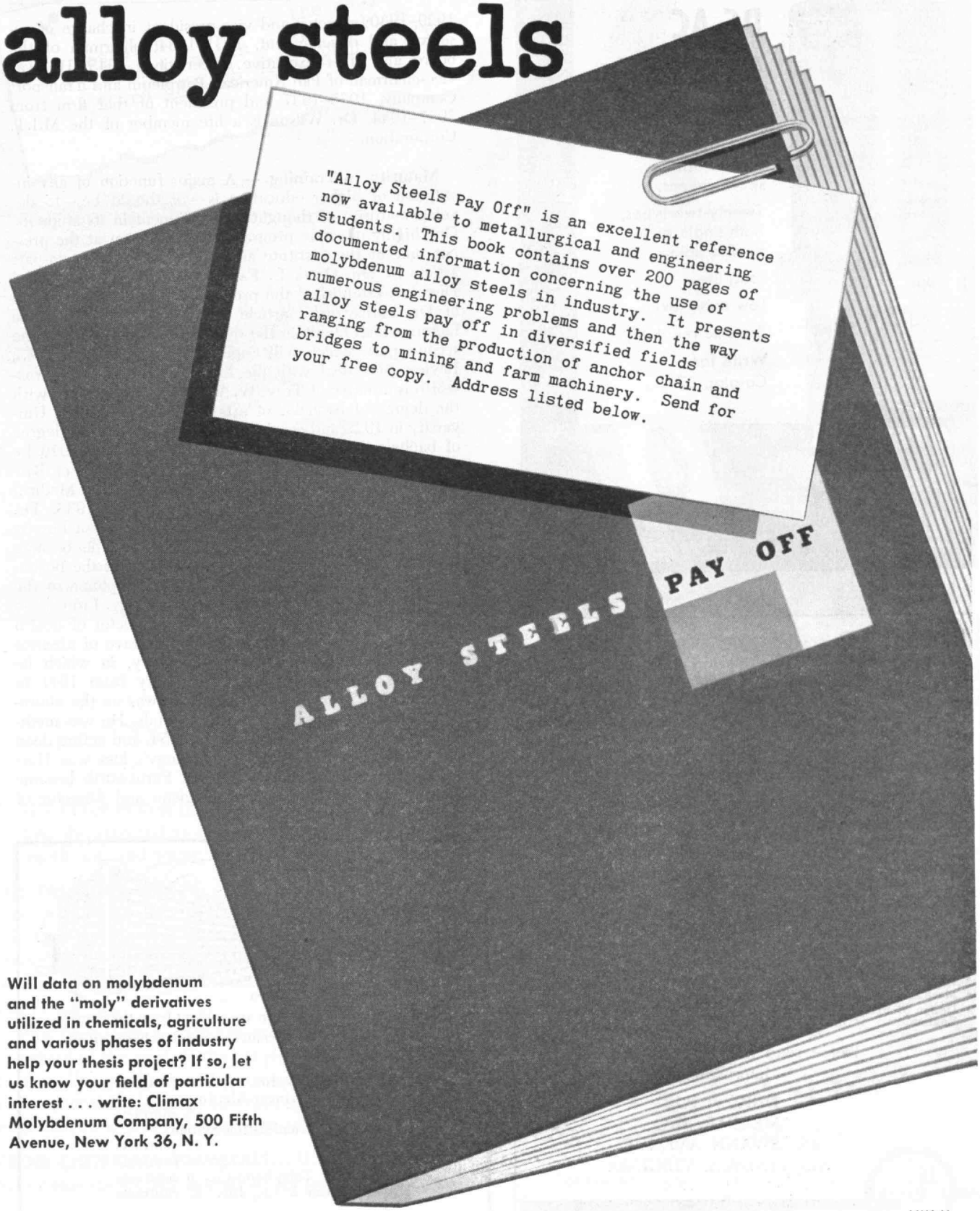
THE TABULAR VIEW

Maps, Interestingly Treated. — Man has wandered over the face of the earth long before he was able to record his activities. So long as his rovings were limited to the narrow confines of a day's walk or two, man learned to recognize his home territory through daily familiarity. But as man traveled farther afield, he needed charts to record his progress and mark the way for those to follow. The earliest known maps were crude drawings, without direction, scale or co-ordinate systems as we know them. As early as the beginning of the Christian Era, however, these features were incorporated in the maps of Ptolemy whose work represents the peak of ancient cartography. Map making fell into decline with the passage of the early Greek and Roman Empires and made its next important step with the invention of the printing press, introduction of the compass for nautical use, and the inauguration of the era of exploration. Today, maps of reasonable precision are available for the asking at gasoline service stations. The fascinating story of maps is told (page 133) by COLONEL JOHN G. LADD, who is a native of Missouri and a graduate of George Washington University with a degree in civil engineering. Before being called to active duty in 1941, he served 18 years with the United States Coast and Geodetic Survey in the fields of charting and mapping. After serving in England as Intelligence Engineer with the II Corps, he was assigned to Headquarters, 5th Army, serving as Engineer Intelligence Officer in Algiers, Morocco, and Italy. In 1946, on returning to the United States, he became Chief of the Engineer Intelligence Division of the Office of the Chief of Engineers. From 1949 to 1953 he was commanding officer of the Army Map Service. He was awarded the Legion of Merit for outstanding service in North Africa and Italy in planning mapping policies and directing the production of maps and survey data required for beach landing and invasion operations.

Minor Industrial Transformation. — A new era of technology was ushered in when the world's first atomic reactor was put into operation at Stagg Field at the University of Chicago during World War II. Since that time, much thought and effort has been expended on means for producing atomic energy for industrial purposes, and already the United States and England have made fissionable material available in support of President Eisenhower's "atoms for peace" plan. Desirable as may be such an objective, nevertheless, it raises questions as to how the new source of energy will affect existing industries. ROBERT E. WILSON, '16, answers the question (page 139) for the petroleum industry in his article "The Probable Impact of Atomic Energy on the Petroleum Industry" which was delivered as an address before the Atomic Energy Conference of the National Industrial Conference Board in New York on October 14, 1954. As chairman of the board of the Standard Oil Company (Indiana), Dr. Wilson's thoughts on this topic have special significance. Dr. Wilson received the Ph.B. degree from the College of Wooster in 1914, and the S.B. degree in chemical engineering from M.I.T. in 1916. He also holds more than half a dozen honorary doctorates. Except for service in the Chemical Warfare Service during World War I, Dr. Wilson was on the Institute's staff from 1916 to 1922. Since 1922, when he joined Standard Oil (Indiana), his responsibilities have become progressively great. He was assistant director of research, 1922–1928; assistant to the vice-president in charge of manufacturing,

(*Concluded on page 126*)

60 case histories of alloy steels



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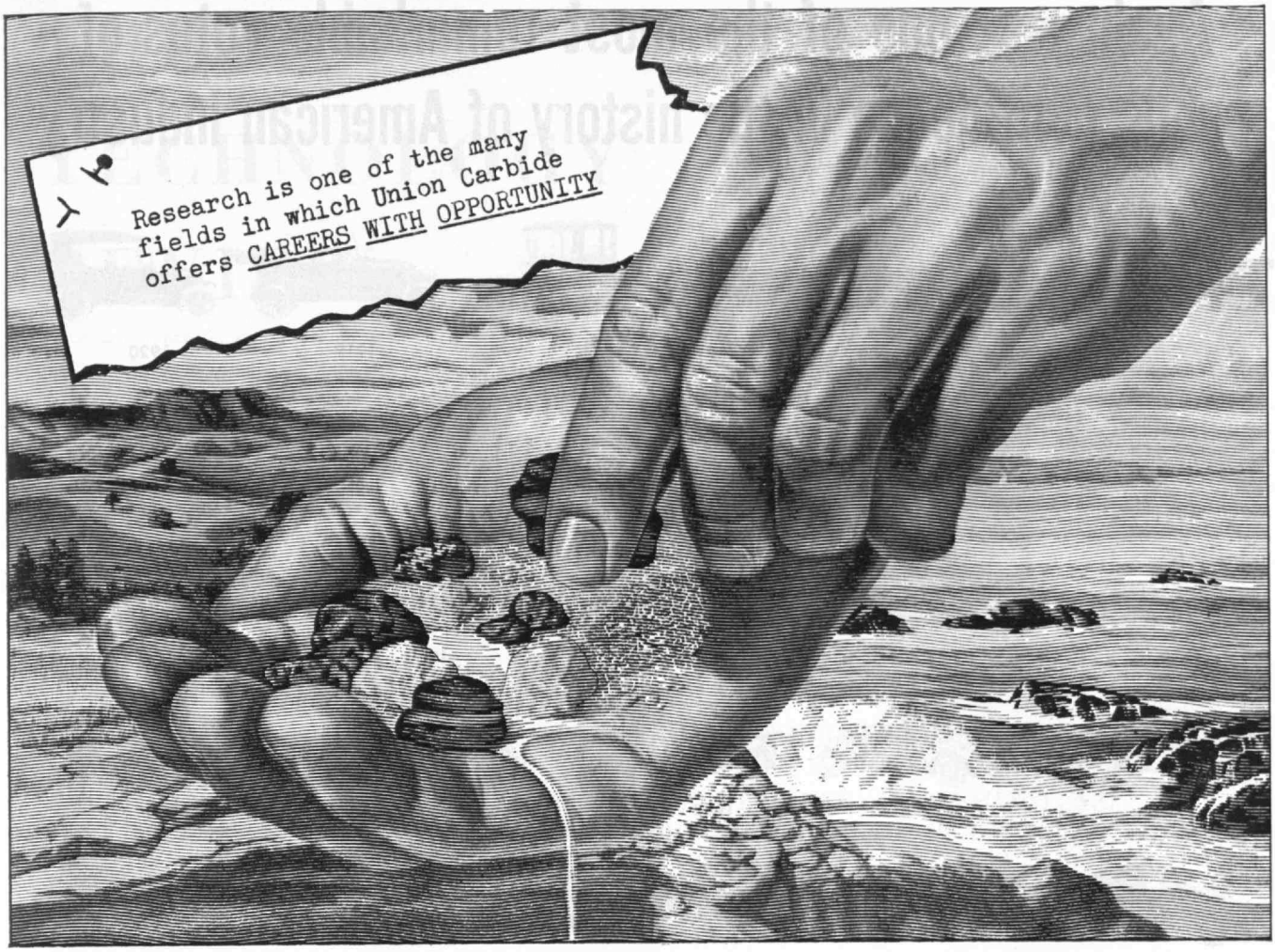
THE TABULAR VIEW

(Concluded from page 124)

1929–1930; director and vice-president in charge of research and development, 1931–1934; chairman of the board and chief executive officer since 1945. He was vice-chairman of Pan American Petroleum and Transport Company, 1935–1937 and president of that firm from 1937–1944. Dr. Wilson is a life member of the M.I.T. Corporation.

Maturity In Training. — A major function of any institution of higher education is – or should be – to develop maturity of thought and judgment in its students. One highly effective program is in operation at the present time at the Institute and is discussed in a two-part article by DR. DANA L. FARNSWORTH, who, as Medical Director, established the present program. The first part of Dr. Farnsworth's article (page 143) discusses those factors which facilitate the development of maturity; the second part, which will appear in the February, 1955, Review, will deal with the M.I.T. program. Dr. Farnsworth is a native of Troy, W. Va. He was graduated with the degree of bachelor of arts from West Virginia University in 1927 and continued his work to win the degree of bachelor of science in 1931. From 1927 to 1929 he taught chemistry and physics in the high school of Barrackville, W. Va., and then entered the Harvard Medical School, from which he was graduated in 1933. Dr. Farnsworth served his internship at the Massachusetts General Hospital from 1933 to 1935, when he became assistant resident in the sanatorium division of the Boston City Hospital in Mattapan. He holds the diploma of the American Board of Psychiatry and Neurology. From 1935 to 1945 Dr. Farnsworth was assistant director of health at Williams College and was granted a leave of absence to enter the medical corps of the Navy, in which he served as a commander on active duty from 1941 to October, 1945. During this period he was on the neuropsychiatric staff of several naval hospitals. He was medical director at M.I.T. from 1946 to 1954, and acting dean of students, 1950 to 1951. Technology's loss was Harvard's gain last summer, when Dr. Farnsworth became Henry K. Oliver Professor of Hygiene and Director of the University Health Services.



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