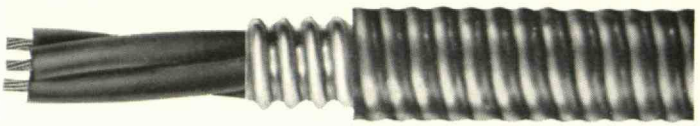
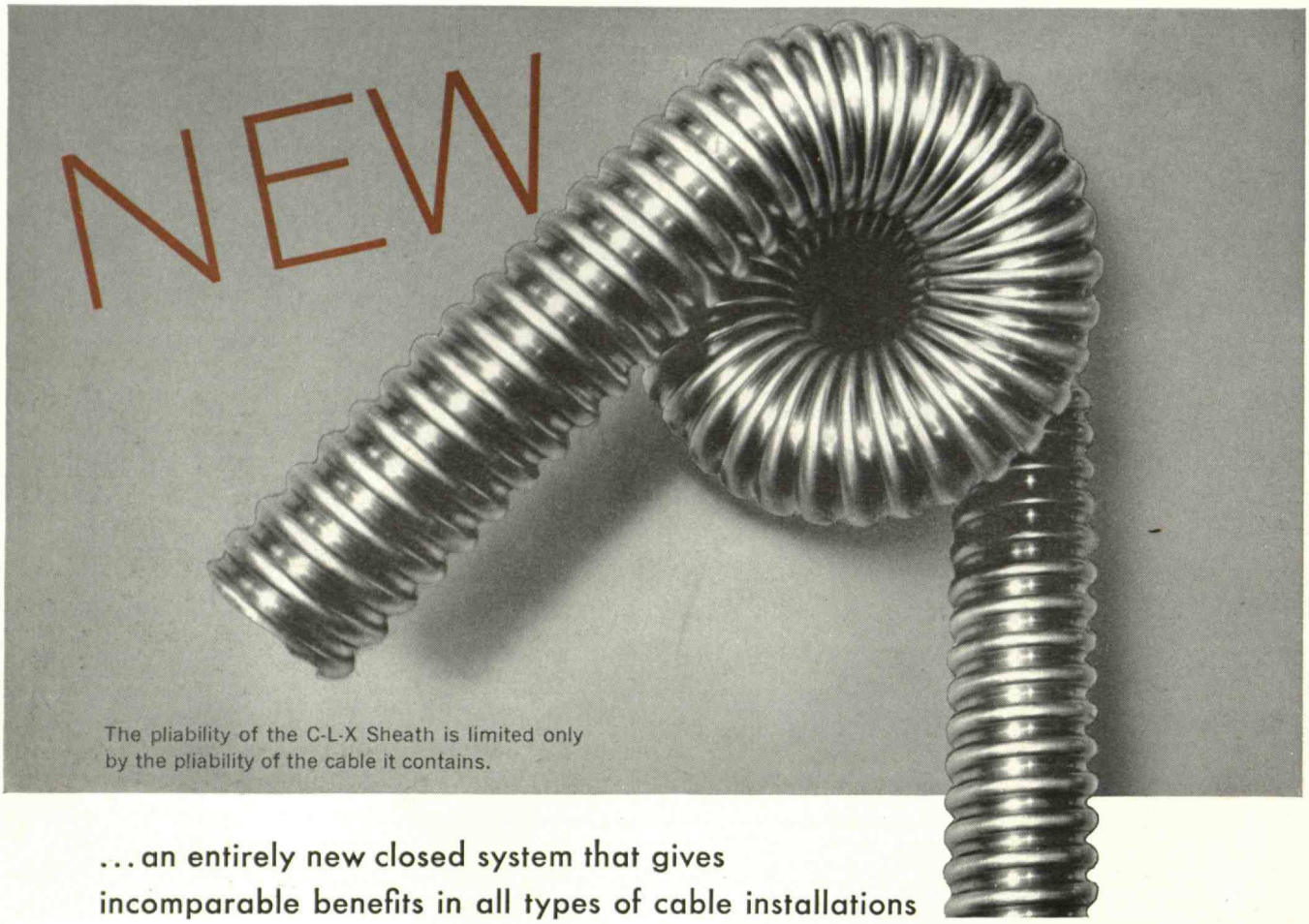
TECHNOLOGY REVIEW

December 1957

Simplex



ANNOUNCES the C-L-X* Sheath



The pliability of the C-L-X Sheath is limited only by the pliability of the cable it contains.

...an entirely new closed system that gives incomparable benefits in all types of cable installations

Simplex C-L-X is a Continuous Lightweight eXterior metallic sheath that is impervious to gases, chemicals and water. Its unique construction gives it a combination of properties that is unmatched by any cable system now manufactured in the United States.

C-L-X provides a completely sealed conduit — with "built-in" cable. C-L-X combines all the advantages of lead sheathed and interlocked armored cables. In addition, it has its own intrinsic qualities of great strength with extremely light weight. It is suitable for installation in trays or by clamps. C-L-X can be used aerially or buried directly in the ground. Its pliability permits ease of installation.

For more than a decade, this type of cable protection has given exceptional service in European installations. *Now, Simplex engineering has adapted C-L-X so that its scope of industrial applications is practically unlimited for modern American installations.* It is unequalled in situations where impermeability and durability are important.

Like all Simplex products, C-L-X is engineered for lasting quality and, therefore, *dependability*. Write for specific product data.

*(Continuous Lightweight eXterior, pronounced "Sealex")

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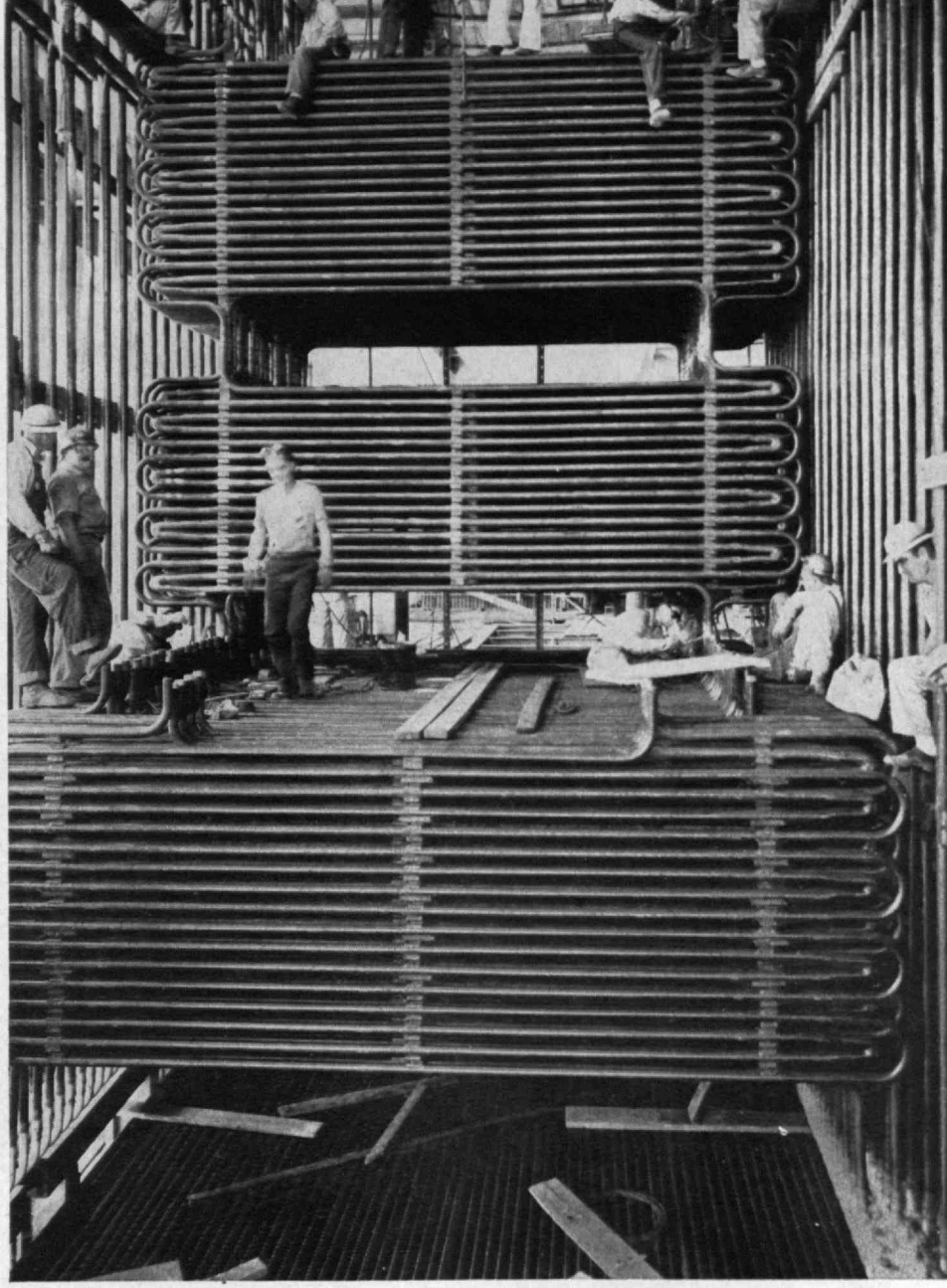
Simplex WIRE & CABLE COMPANY

79 SIDNEY STREET, CAMBRIDGE 39, MASS.

"the American manufacturers of transoceanic telephone cables"

THE TECHNOLOGY REVIEW, December, 1957, Vol. LX, No. 2. 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, $4.00: Canadian and Foreign subscription, $4.50. Entered as second-class matter December 23, 1949, at the Post Office, at Bristol, Conn., under the Act of March 3, 1879.

The remarkable story of STEAM



In the good old days, it was a simple matter to boil water and make steam. The large utility boilers of half a century ago would fit in many a modern living room . . . top steam pressures were about 200 pounds per square inch . . . and temperatures not much above the boiling point in a tea kettle.

What a different story today!

To illustrate, take a look at the picture opposite, which shows a small portion of a large C-E utility boiler – the rear pass containing a part of the tubing used to superheat and reheat the steam. In boilers such as this, steam, at a pressure of about 2500 psi*, travels through a mass of tubes, totaling more than a hundred miles, and is heated to a temperature of 1050 deg. F. After it does its work in the high pressure section of the turbine, it is returned to the boiler where a large part of its energy is restored by reheating to a temperature of 1000 deg. It then completes its trip through the turbine, is condensed, and returns to the boiler to start the same cycle all over.

Compared to its predecessor of half a century ago, the modern utility boiler produces steam that – pound for pound – generates electricity about 450 per cent more efficiently. Moreover, it occupies far less space for equivalent output; in fact, just *one* of the largest boilers C-E is building today is equivalent in capacity to *100* of the largest boilers of the early nineteen hundreds.

These vast advances in the art of steam generation are the principal reasons why the utility industry has been able to keep the cost of electricity down while the costs of all other important commodities have risen sharply. Evidence of this is the fact that the average charge per kw-hr last year – the country over – was lower than in any preceding year.

This is all by way of leading up to the point that you can be sure of getting the most out of your steam – in terms of lifetime economy and reliability – with boilers designed and built by Combustion. They are available for all steam requirements – power, process or heating – from those of small industrial and institutional plants to the largest power stations.

*C-E is now building a boiler which will set a new world's record for steam pressure and temperature – 5000 psi, 1200 deg. F. with double reheat.

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First, the pure theory—applied without delay to practical inventions: this was the tenor of Lord Kelvin's outstanding work.

Following his "Law of Squares" in 1853 he perfected the curb transmitter, which overcame the retardation of signals in long-distance cables.

From Lord Kelvin's theory plus practice, more than a century ago, stem today's advances in communications.

For over a century, Kerite theory and practice has proved that Kerite is the most lasting cable known. More than three generations of Kerite craftsmen have given of their inherited skill to assure the long life and service of Kerite Cable. The Kerite Cable Company takes pride in the fact that their product is chosen by buyers of integrity to safeguard installations around the world.

The value and service life of a product can be no greater than the integrity and craftsmanship of its maker.

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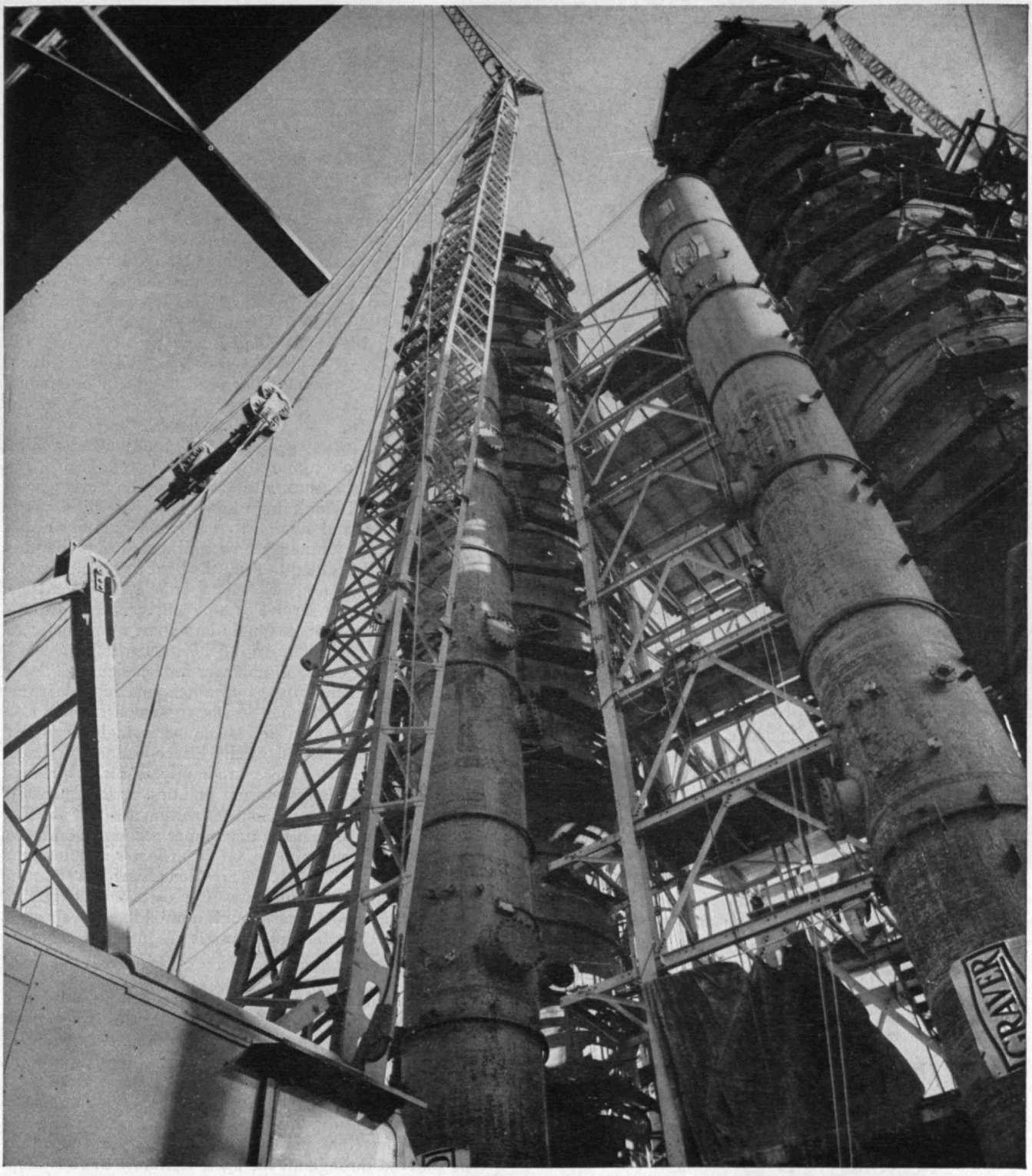

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THE TABULAR VIEW

M.I.T.'s Founder. — Last spring, the College of William and Mary held impressive ceremonies in celebration of the 75th anniversary of the death of an illustrious alumnus. Taking part in these ceremonies, at which he received an honorary D.Sc. degree, was JAMES R. KILLIAN, JR., '26, the 10th President of the school founded by William Barton Rogers in 1861. President Killian's able dissertation on the life of the founder of M.I.T. appears on page 105 of this issue. It sheds additional light on the life of the William and Mary alumnus whose long-cherished hope to found a new type of school (in which pure and applied science were fused and their cultural and utilitarian values used to the fullest) found fruition in Boston. That President Rogers' concepts on education are fully adapted to the needs of our Twentieth Century society are evident to all who have followed President Killian's administration of "Boston Tech." For nearly a third of a century, the pages of The Review have reflected Dr. Killian's impressive work as author, editor, educator, and administrator. His biography needs no recital here, although new and significant chapters will certainly be added to it. In the light of recent events, prophetic indeed are Dr. Killian's remarks (page 128) that, "If we are to survive as a nation, science most certainly will play an increasingly large part in our national life." With his appointment on November 7, as Special Assistant to President Eisenhower for Science and Technology, Dr. Killian embarks on a new and highly significant mission for national service in which science and technology are destined "to play an increasingly large part in our national life." Naturally his colleagues, in Cambridge as well as elsewhere, are happy at this new recognition of Dr. Killian's unusual abilities. It is gratifying, too, to learn that – without exception so far as The Review knows – the many newspaper accounts and radio and television commentaries on Dr. Killian's appointment have hailed his selection by President Eisenhower as an ideal man for a difficult post. As recorded on pages 96 and 97 of this issue, Dr. Killian is now on leave of absence from M.I.T. The Institute's loss is the nation's gain.

Man's Achievement. — No stranger to Review readers is JAMES A. TOBEY, '15, whose article in this issue (page 109) traces the antiquity of disease throughout recorded history and even back to the time when huge, prehistoric reptiles roamed at will in the primeval ooze. Dr. Tobey takes comfort in the knowledge that, in the short span of about a century, man has found ways of using his mind to overcome most of the maladies from which he has suffered throughout the ages. Certainly there is hope that other maladies of man can be overcome likewise by developing and properly directing first-rate minds. After having attended the Roxbury Latin School, Dr. Tobey received the S.B. degree from M.I.T. in 1916, the LL.B. degree from Washington Law School in 1922, an M.S. degree from the American University in 1923, and the Dr.P.H. degree from M.I.T. in 1927. Dr. Tobey's professional life has been spent in advancing public health and in improving state and national laws affecting it. Dr. Tobey has lectured at such universities as Yale, Harvard, Columbia, and M.I.T., has served the Army's Medical Service in the role of Colonel, and is a lucid and prolific writer on topics dealing with public health. Dr. Tobey

(*Concluded on page 92*)

BENCH-SCALE DISTILLATION EQUIPMENT. The Center has various types and sizes of apparatus to distill any size sample from one cc to a tank-car load.

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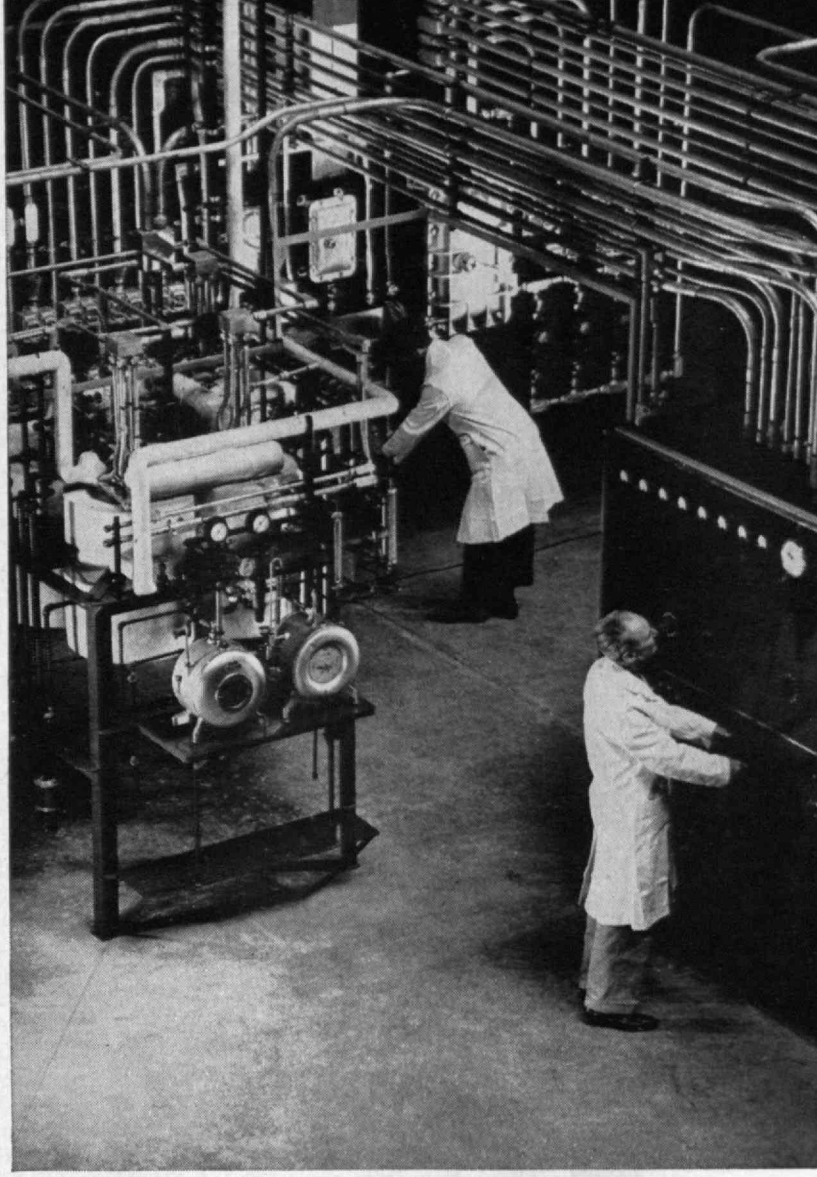
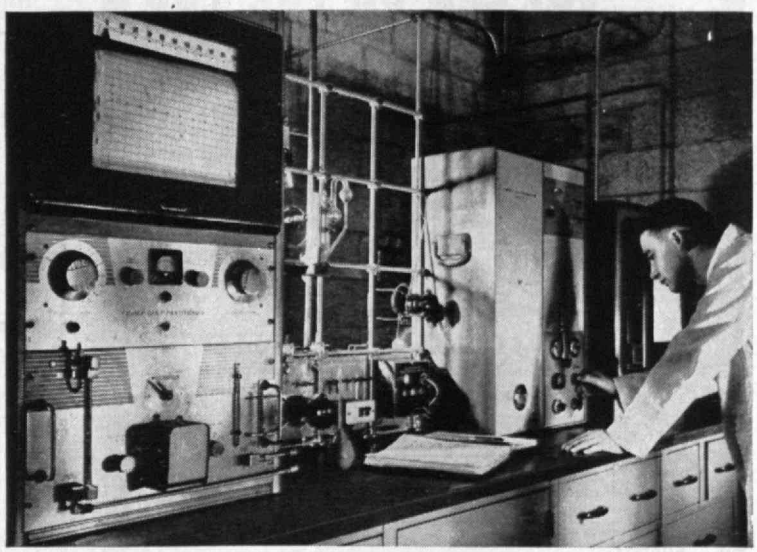


MOST PILOT UNITS-at The Center are put together from standard "building blocks." Skid-mounted charging units such as the one at left hold tanks, heaters and pumps for transfer and metering. Process equipment, here shown in background center, can be widely varied. At right is electrical control cabinet. All switches, relays and controls not housed in explosion-proof boxes are enclosed in cabinets like this one, pressurized with outside air to exclude process vapors.



ANALYSIS OF MATERIALS processed and produced in pilot operations at The Center is an important part of the work carried out by Lummus engineers. Here a laboratory technician determines the composition of a multiple-component gas, using a gas chromatography technique.

is author of *Public Health Law*. He also has been associate editor of the *American Journal of Public Health*, has written about 20 pamphlets and more than 100 articles. Connecticut and Florida both claim him as resident.

Society's Problem. — After advancing the argument that it is society at large who shouts loudest to benefit from technology, LAWRENCE R. HAFSTAD deplores the fact (page 111) that the mass of our population remains ignorant of the foundations on which their technological society is based. Dr. Hafstad holds that a major and urgent problem of our society is to revise and stiffen our educational system, for "progress cannot be made without struggle, nor freedom enjoyed without personal responsibility." He emphasizes, especially, the need for mature, responsible citizens to have a good background in those subjects — primarily mathematics, physics, and chemistry — on which a technological society depends. Dr. Hafstad received the B.S. degree in electrical engineering from the University of Minnesota in 1926, and the Ph.D. degree in physics from the Johns Hopkins University in 1933. From 1928 to 1946 Dr. Hafstad was on the staff of the Carnegie Institution of Washington. During World War II he was assigned to the staff of the Applied Physics Laboratory of Johns Hopkins at Silver Spring, Md. In 1947 he became executive secretary of the Research and Development Board, Office of the Secretary of Defense. In addition, he served as professor of applied physics at Johns Hopkins from 1947 to 1954, and was director of the Johns Hopkins Institute for Co-operative Research from 1947 to 1949. Between 1949 and 1955 he was first director of the Reactor Development Division, Atomic Energy Commission, and from 1949 to 1951 carried a Presidential appointment as chairman of the Interdepartmental Committee on Scientific Research and Development. In January, 1955, he became director of the Atomic Energy Division of the Chase Manhattan Bank, and later that year became vice-president of General Motors Corporation, in charge of the Research Staff. Dr. Hafstad's article was delivered before a meeting of Sigma Xi, and is reprinted from *American Scientist*, Volume 45, Number 2, March, 1957.