

# TECHNOLOGY

## REVIEW

*March 1958*





# Right off the Wire

A new system using multiple cathodes is said to double the life of the vapor lamps used on highways.

A thermionic converter has been made that produces electricity directly from heat with an efficiency of eight per cent.

Studies of the northern lights being made with a high-powered, long-range radar may disclose a method of defense against missiles coming over the arctic.

Submarine cable can be made in any length at the Simplex Submarine Cable Division's dock-side plant. Single lengths are limited only by the capacity of a cable ship's hold, or the length of a train of gondola cars.

An electronic system of bank record keeping handles randomized, unpunched paper checks at the rate of 1800 checks per hour to 40,000 accounts.

The world's largest solar furnace is being designed for installation in New Mexico. It will produce temperatures as high as 8,000°F.

Elimination of thermal noise by operating microwave amplifiers at the temperature of liquid helium has been found to greatly increase the range of radar.

An electronic map plotter is expected to make possible more accurate and cheaper maps from aerial photographs and to lend itself to the automation of mapping.

Plans are being made to mount telescopes on balloons in order to make observations above the interference of the earth's atmosphere.

The U. S. Air Force has patented an infrared television camera for use at night or in fog.

A new chemical plant will need no outside source of fuel after operation has begun. All the heat required will come from the process.

It has been found that one area of the human brain contains a record of every detail of the person's experience. Total recall can be produced by the stimulation of a minute electrical pulse.

Phosphors applied to textiles, sheet materials or metal mesh light up when a current is passed through them thus making draperies, for example, sources of illumination.

A new microscope for the study of living tissues uses bursts of ultraviolet light too brief (one thousandth of a second) to injure the tissue. The image appears in color on a television screen.

A new drug promises to save the lives of many persons who might otherwise die from lethal doses of radiation. It has been tried only on laboratory animals.

A form of fiber glass containing uranium 235 has been developed as a fuel for atomic furnaces.

A new amplifier is expected to extend the range of radio telescopes about ten times, enough to equal the best optical instruments.

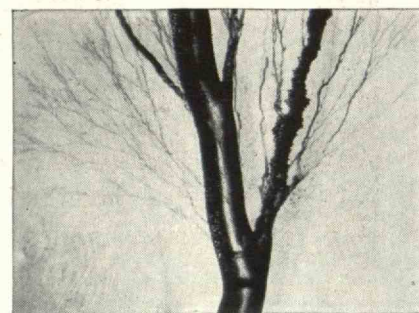
A giant air mattress, equipped with arresting and launching gear, has been patented for use as a portable airstrip. On it planes could make belly landings without damage.

Tellurium lead cable sheath has excellent vibration, creep and age-hardening resistance, and greater flex life and tensile strength than other lead alloys, say Simplex scientists after exhaustive tests.

A new meter for oil pipelines will measure a flow of 10,000 barrels per hour (four times the capacity of present equipment) with an accuracy of one tenth of one per cent.

Simplex C-L-X (Sealex) metallic sheath is manufactured with thermoplastic covering in colors for voltage or general industrial coding.

A device called an "electronic sentry" guards against fire, abnormal pressure, high or low water levels, temperature changes and other hazards. It calls a designated person by telephone and gives a pre-recorded message.



## "Tree" of Knowledge

This strange looking growth tells an important story to the expert eyes of Simplex scientists. It's a Simplex photomicrograph showing "treeing" effect that results when a 15 KV polyethylene-insulated cable is broken down by 100,000 volts. This is typical of the continuing research work done at Simplex.

If you are interested in the important facts that Simplex scientists Kitchin and Pratt have discovered on polyethylene treeing, write for their AIEE Paper No. 58-121.

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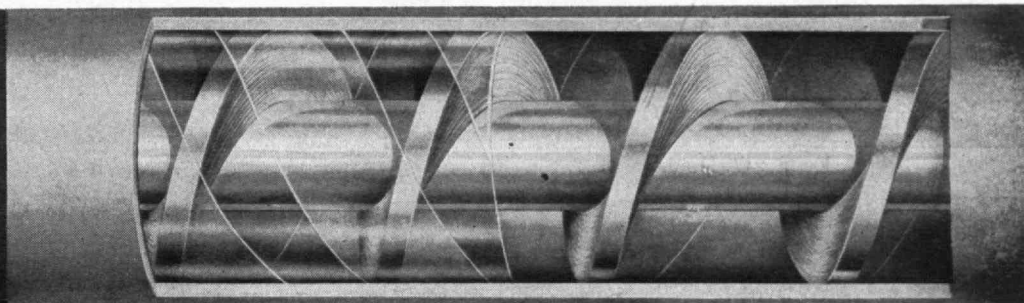
"The American manufacturers of transoceanic telephone cables"



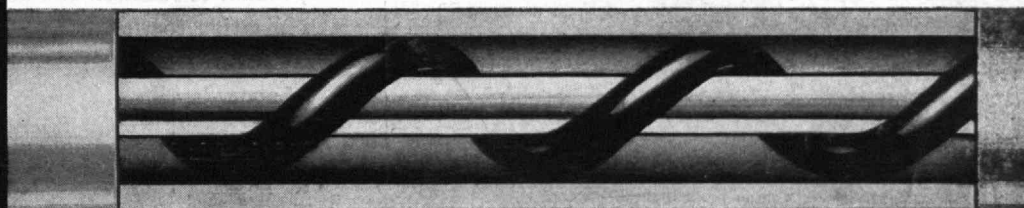
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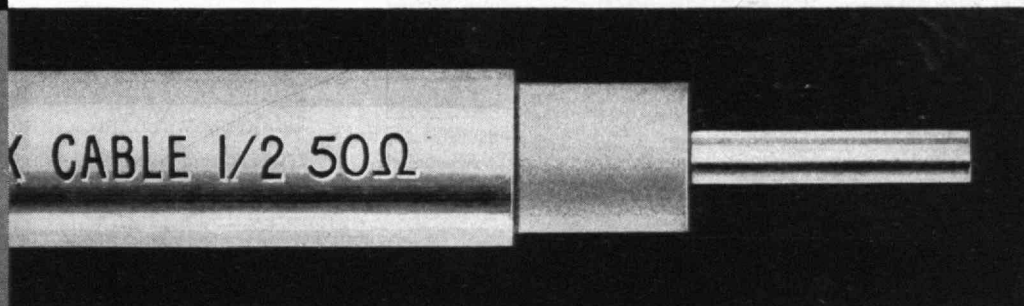
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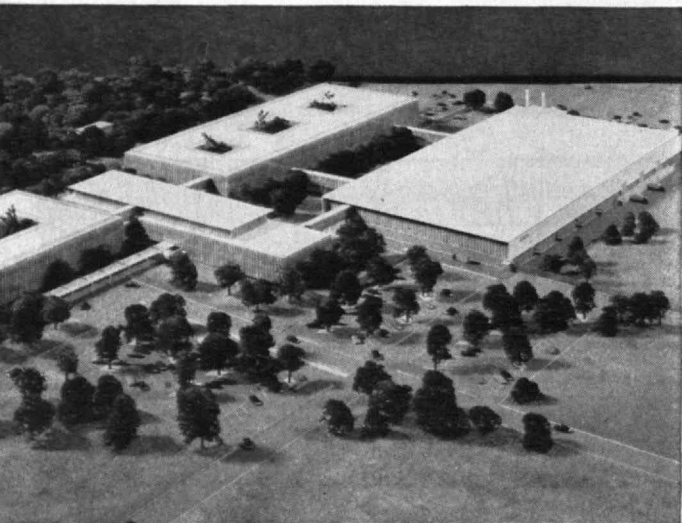


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Dennis W. Holdsworth



Pictured above is our new Research and Development Center now under construction in Wilmington, Massachusetts. Scheduled for completion this year, the ultramodern laboratory will house the scientific and technical staff of the Avco Research and Advanced Development Division.

Avco's new research division now offers unusual and exciting career opportunities for exceptionally qualified and forward-looking scientists and engineers.

Write to Dr. R. W. Johnston, Scientific and Technical Relations,  
Avco Research and Advanced Development Division,  
20 South Union Street, Lawrence, Massachusetts.

## IDEALS AND PRACTICALITY

*"Science and Philosophy mutually criticize each other and provide imaginative material for each other."... Alfred North Whitehead.*

In the increasing preoccupation of science with material things and progress, the truth of this statement by one of our greatest philosophers is often overlooked and forgotten. The scientific philosopher is a rare being and is becoming rarer still, nor can he be adequately replaced by the group technique or the 'brainstorm' session.

It should be one of the noblest aspirations of all our sciences to provide for the true contemplation of the inner meaning of facts and to stimulate that interplay of mind on mind by which alone we may progress.

In all these things, however, we cannot forget the problems peculiar to research and development in private industry. The obligation to work to otherwise-determined time-scales poses a nice problem in balancing ideals against the practicalities of everyday life.

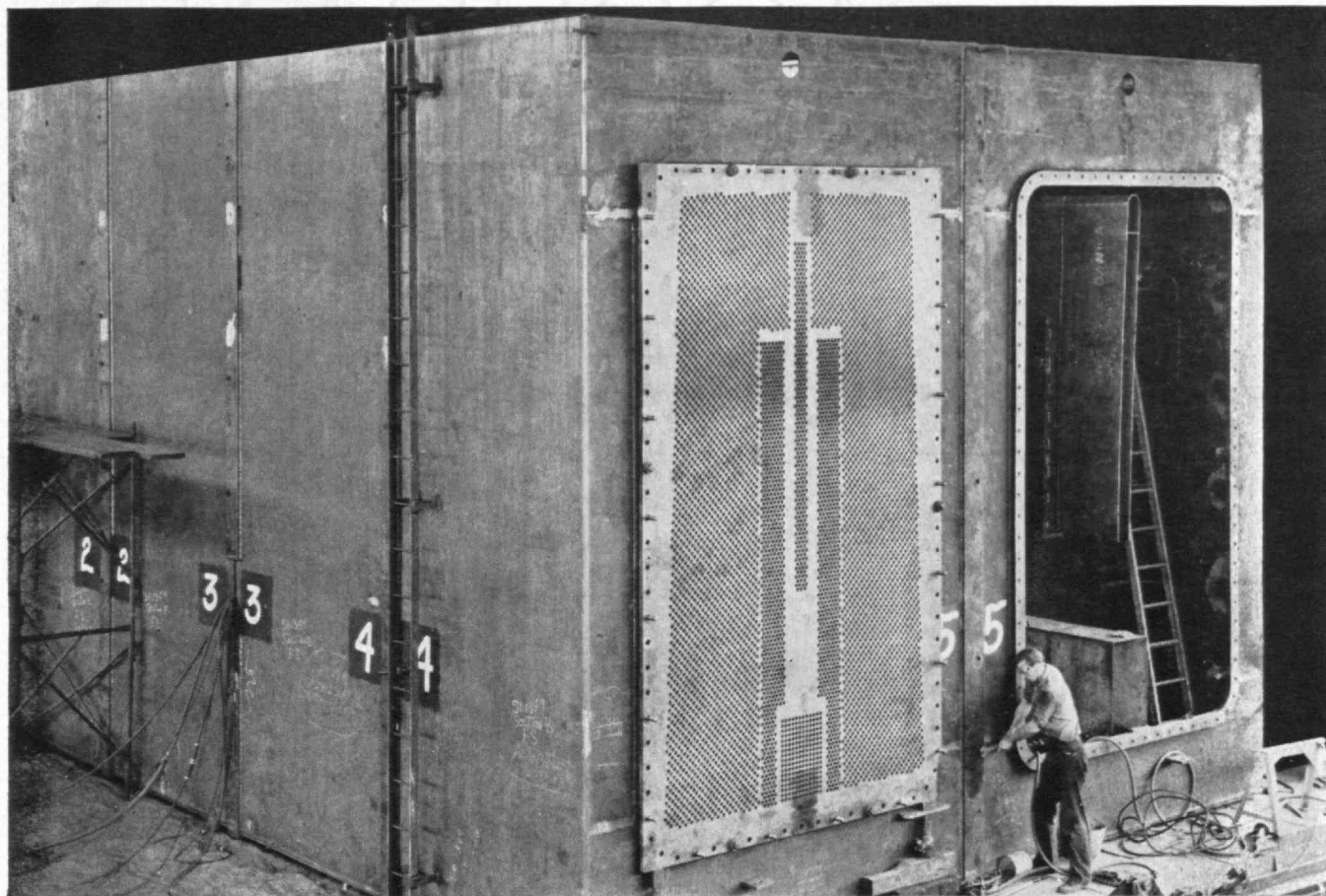
It is in this field that the test of management comes. Its success at meeting such continuously conflicting requirements determines the character and ultimate success of the organization.

With such thoughts as these in mind, we here at Research and Advanced Development Division of AVCO are seeking unique people. We wish to foster the creative minds and fundamental thinkers, while preserving an atmosphere of self-discipline, free from a rigid hierarchy of command and organization.

Dennis W. Holdsworth,  
Manager, Computer and Electronic Systems Department

# AVCO

*Research & Advanced Development*



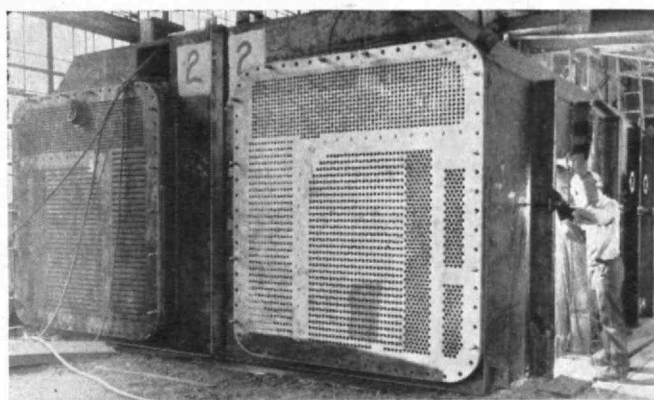
**HERE'S ONE SHELL** of this twin-shell, triple-lane unit just before shipment to Consolidated Edison's Astoria Station. It's designed to condense 1,600,000 lbs. steam/hr. at 1.87" Hg., with 244,000 gpm circulating water, and has 27,450 aluminum-brass tubes. Unit serves 335,000 kw turbine.

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**TYPICAL REVERSE FLOW CONDENSER** is this 35,000 sq. ft. unit for a Southern electric utility. Patented Reverse Flow feature permits flushing debris from tubes with only slight (and momentary) vacuum loss. Note low height to save head room, rectangular cross section to further utilize space for this Wheeler client.

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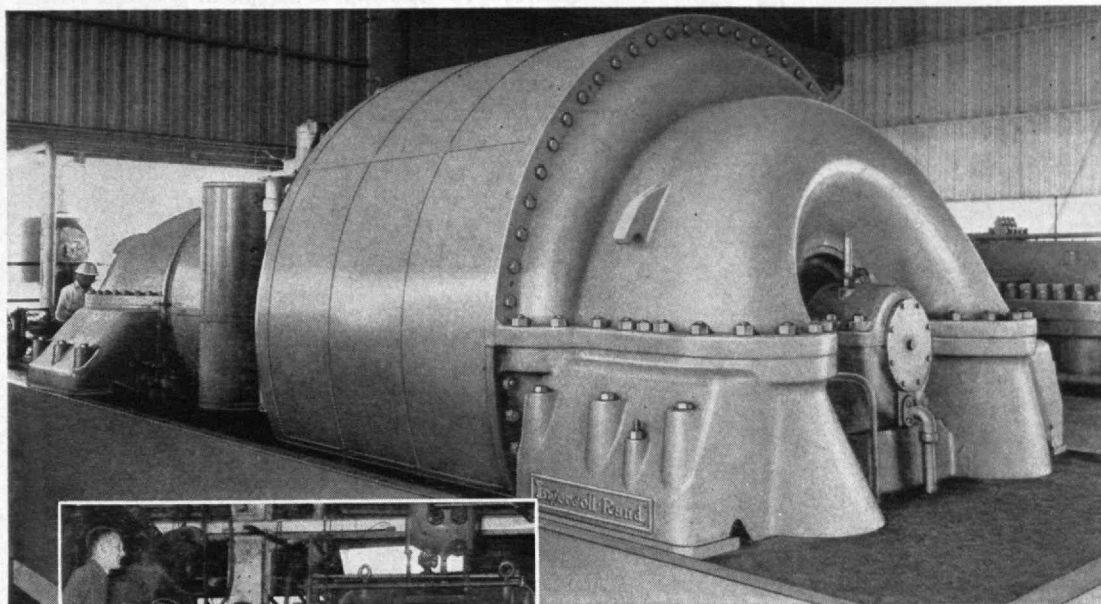


## **TIMES FACSIMILE CORPORATION**

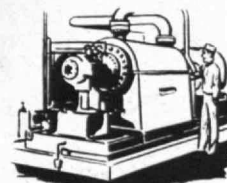
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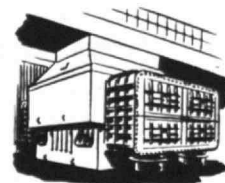
Centrifugal Pumps



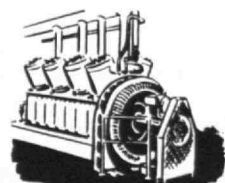
Rock Drills



Air & Electric Tools



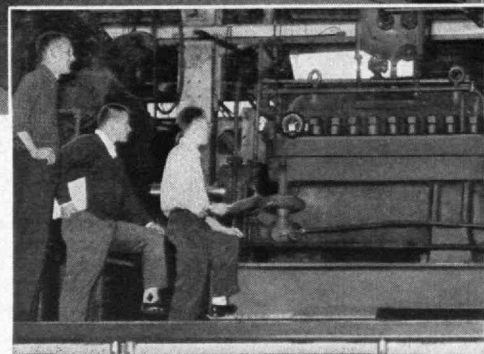
Steam Condensers



Diesel & Gas Engines

ABOVE: This huge I-R Turbo-Blower is the largest cat-cracking air blower ever built. It delivers 161,500 cfm of 30 psi air at Tidewater Oil Company's new Delaware refinery, and is driven by an 11,250 hp I-R steam turbine.

LEFT: Engineering trainees at Ingersoll-Rand's Phillipsburg, N. J., plant check final performance tests on another blower of smaller size and higher pressure.



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design, development and application of such specialized industrial machinery.

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## THE TABULAR VIEW

Answers to Sputnik? — Artificial earth satellites, whether placed in their orbits by the United States or by other nations, forcefully bring to our attention the need for developing this nation's scientific potential as completely as possible. One proposal for helping to achieve this aim is given (page 251) by ARTHUR R. VON HIPPEL, Professor of Electrophysics, who established, and is the director of, the Institute's Laboratory for Insulation Research. The work of this Laboratory cuts across many fields, such as physics, chemistry, mathematics, mechanical engineering, and electrical engineering, for example. It is not surprising, therefore, that Professor von Hippel proposes the establishment of federally sponsored university research centers, operating on a truly interdepartmental level, as a means of strengthening science for national defense. Professor von Hippel received the Ph.D. degree from the University of Göttingen in 1924, and was Rockefeller Fellow, University of California at Berkeley in 1927-1928. He taught at the University of Jena (1928-1929), the University of Göttingen (1929-1933), the University of Istanbul (1933-1934), and the University of Copenhagen 1935-1936).

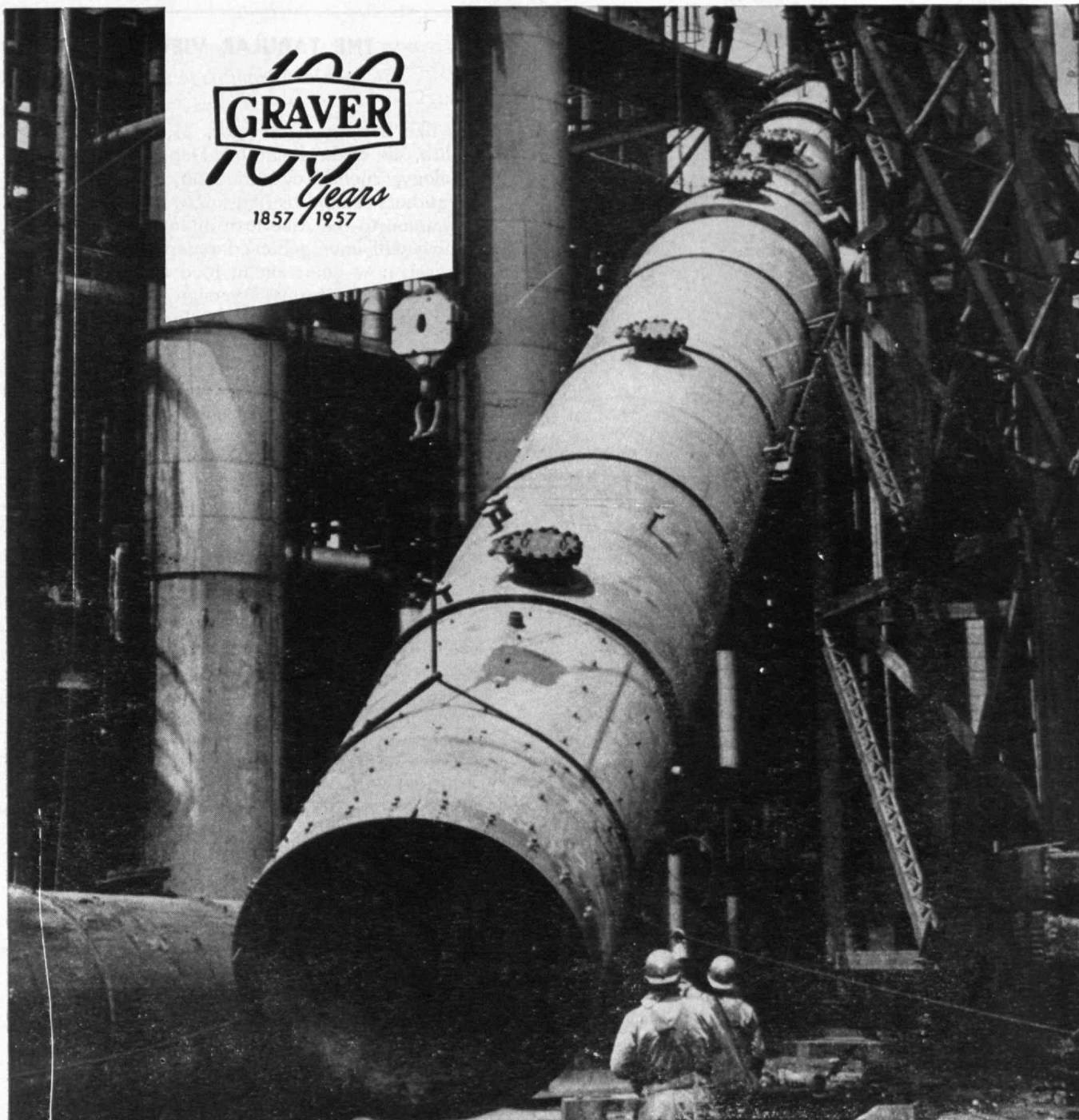
**Dignity of Individual.** — The mass-production techniques of the Twentieth Century, and the co-operative teamwork which is thereby entailed, leaves little time — and perhaps less interest — to examine critically the role of the individual in today's society. In his essay on "The Dignity of the Individual in the Twentieth Century" (page 253), JOHN B. WILBUR, '26, Professor of Civil Engineering, expresses concern for the effect of technological progress on the dignity of the individual. The most meaningful province of private enterprise is universal moral discipline, concludes Professor Wilbur, who adds that members of a free society can — and will — give their devotion to the common cause. Professor Wilbur received the S.B., S.M., and Sc.D degrees from M.I.T. in 1926, 1928, and 1933, respectively. He was assistant in the Department of Civil Engineering between 1926 and 1928, and then joined the engineering staff of the Maine Central Railroad Company. From 1929 to 1930, he was bridge designer for the New York Central Railroad Company. In 1930, Dr. Wilbur returned to M.I.T. as instructor in Civil Engineering. He was made assistant professor in 1934, associate professor in 1937, and professor of structural engineering in 1943. In 1946 he was made head of the Department of Civil and Sanitary Engineering, after having served for two years as its acting head. In addition to his professional achievements, Dr. Wilbur is perhaps best known, at least among Technology Alumni, for his composition "Sons of M.I.T."

**Tomorrow's Table.** — What will America's increasing population be having for dinner a decade or two hence? The nonspecialists in foods may have a difficult time answering this question. But to food spe-

(Concluded on page 236)



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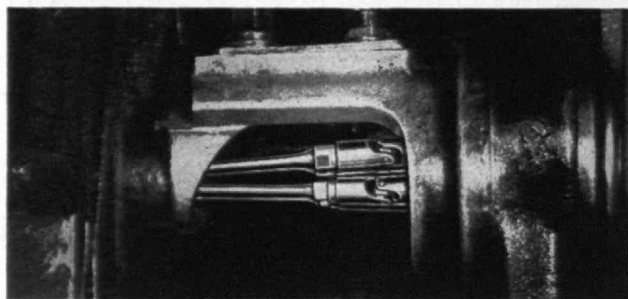
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## THE TABULAR VIEW

(Concluded from page 234)

cialists like Bernard E. Proctor, '23, and Samuel A. Goldblith, '40, of the Institute's Department of Food Technology, such prognostication is not difficult. These authors remind us (page 255) that many products common to the American dining table 10 years from now will have achieved acceptability because of research now going on in food technology. The Review article is a printed version of a paper presented at the Conference on New Directions in Food Marketing, held at the School of Retailing, University of Pittsburgh, on April 5, 1957.

Professor Proctor received the S.B. and Ph.D. degrees from M.I.T. in 1923 and 1927, respectively. Between 1923 and 1926 he was an instructor in biochemistry in the School of Medicine, Boston University. Since 1926 he has been a member of the M.I.T. staff: first as assistant and instructor, and later as a member of the Institute's Faculty. He became professor of food technology in 1944, and the following year became director of the Samuel Cate Prescott Laboratories of Food Technology. Since 1952 he has been head of the Department of Food Technology. He is author of many technical papers and, with Samuel C. Prescott, '94, wrote *Food Technology*, published by the McGraw-Hill Book Company, Inc.

Professor Goldblith received the S.B., S.M., and Ph.D. degrees from M.I.T. in 1940, 1947, and 1949, respectively. He was a member of the staff of Arthur D. Little, Inc. in 1940-1941, and served with the United States Army from 1941 to 1946. He joined the M.I.T. staff as a research associate in 1949, was made assistant professor of food technology in 1952, associate professor in 1955, and became executive officer of the Department of Food Technology also in 1955. He is the author of numerous articles in professional journals in the field of nutrition, and is associate editor of *Food Technology*.



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