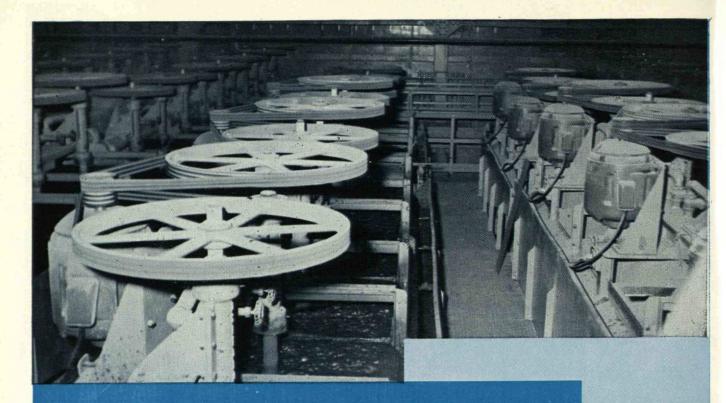
# TECHNOLOGY

REVIEW January 1956





# Agitator cells keep kigh flow rate with Simplex-ANHYDREX Cable

Here, if ever, is the place where cable dependability is of the utmost importance. If the motors slow down or stop because of mechanical or chemical damage to cable, the smooth flow of material stops, too.

Does it make sense, then, to trust the output of a multimillion-dollar mill to cable on which fifty cents per thousand feet was saved?

Simplex-ANHYDREX Cable operates dependably whether conduits are contaminated with pine oil, concentrating agents or condensate.

The jacket and particularly the insulation of ANHYDREX Cable is unusually resistant to moisture. These are qualities you want in your power cable. To be sure you get them, be sure you get ANHYDREX.

Simplex ANHYDREX Cables



# stored in **GRAVER** underground tanks

There was a time when Graver built tanks for storage of crude. That was 96 years ago when oil was first discovered. Graver still builds tanks for crude storage—and also for storing gasoline, kerosene, LP-gas and many other volatile liquids. Just recently Graver precision-fabricated a flock of large underground tanks for jet fuel storage. They will withstand a working pressure of 60 psi.

Whatever your storage problems, call on us. We have undoubtedly solved similar ones before.



CLASSIFIED! Pictured is one of 35 tanks which will be buried in the ground at an undisclosed site. Each tank holds in excess of 50,000 gallons.



. . BUILDING QUALITY TANKS FOR 98 YEARS

### GRAVER TANK & MFG. CO., INC.

East Chicago, Indiana

CHICAGO - NEW YORK - PHILADELPHIA - EDGE MOOR, DEL. - CATASAUQUA, PA.
PITTSBURGH - CLEVELAND - DETROIT - TULSA - SAND SPRINGS, OKLA. - HOUSTON
ODESSA, TEXAS - CASPER, WYO. - LOS ANGELES - FONTANA, CAL.
SAN FRANCISCO



#### Attention: ENGINEERS



#### melpar, inc.

A completely integrated facility for system responsibility from design concept through production and field service.

Many government agencies, industrial organizations and engineers have profited by taking advantage of Melpar's facilities. For detailed information write to —

**Technical Personnel Representative** 



#### melpar, inc.

Subsidiary of Westinghouse Air Brake Co.

3000 Arlington Blvd., Falls Church, Va. 99 First St., Cambridge, Mass. 11 Galen St., Watertown, Mass.

Laboratories located in Falls Church and Arlington, Va., Cambridge and Watertown, Mass. and Tucson, Arizona

#### THE TABULAR VIEW

Arts Colleges. - No regular reader of The Review needs to be reminded that schools of science and engineering are unable to supply the current demand for technically competent personnel. Nor do they need to be refreshed as to the desirability of flavoring a professional technical education with a bit of "the humanities." But are the students of the liberal arts colleges merely "executing intellectual minuets" as has been said? And what is the role of the liberal arts college - especially the small one - in equipping today's youth to cope with a world of jet propulsion and television? This problem is discussed (page 137) by JAMES STACY COLES who in 1952 assumed the presidency of Bowdoin College after a career of teaching and research in chemistry. The combined program of a liberal arts training supplemented by science and engineering, which Bowdoin and M.I.T. operate, gives ample proof of Dr. Coles's contention that a liberal arts training is as necessary for the well-educated man of today as a background in science. President Coles received the B.S. degree from Pennsylvania State Teachers College in 1934; from Columbia University he received the A.B., A.M., and Ph.D. degrees in 1936, 1939, and 1941, respectively. He taught chemistry at the College of the City of New York (1936-1941), Middlebury College (1941-1943), and Brown University (1946-1952). During World War II, Dr. Coles was supervisor of the Underwater Explosives Research Laboratory at Woods Hole, Mass. His article in this issue of The Review is a pleasant sequel to a luncheon meeting at the Faculty Club in November at which the role of the small liberal arts college was unfolded before members of the M.I.T. Faculty.

Brook Farm. — Vociferous proclaimers that ideal conditions for man's welfare are provided by the socialistic or communal state can point out that the Pilgrims practiced a form of communism, and that a number of settlements for socialized living were operating in the United States about a century ago. Some of these colonies were established by well-educated, well-meaning, high-principled — even idealistic — individuals, yet none of them survived. One of the most promising experiments in socialized living was the settlement at Brook Farm, in what (Concluded on page 128)

The Pullman Co.

#### SPEED

that assures completion at the earliest date.

EFFICIENCY IN CONSTRUCTION

that results in lowest cost.

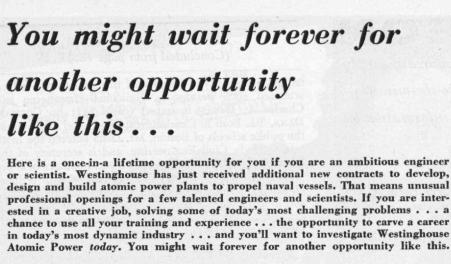
#### SOUND WORKMANSHIP

that guarantees minimum maintenance expenses.

These are the reasons why 80% of our contracts come from companies we have served repeatedly.

# W. J. BARNEY CORPORATION INDUSTRIAL CONSTRUCTION 101 Park Avenue, New York

Alfred T. Glassett, '20, President Founded 1917



For many of these jobs you do not need previous experience in atomic power. Can you qualify for one of these assignments?

PHYSICISTS-MATHEMATICIANS Experimental Physicists for Research Studies with Nuclear Reactors; Theoretical Physicists for General Reactor Theory Development and Dynamics. Mathematicians—Research in Applied Mathematics, Numerical Analysis, and Digital Computing Techniques relating to Nuclear Power Reactors.

METALLURGISTS Basic Research in Physical Metallurgy, Corrosion and Radiation Effects on Metals; Applied Research and Development on Materials and Fabrication Processes for Reactor Fuel Components, Power Metallurgy and Metal Working; Non-Destructive Testing.

Stress Analysis.

MECHANICAL ENGINEERS To Design Power Plant Components—Heat Exchangers, Pumps, Valves, etc.; Experimental and Theoretical Heat Transfer and Fluid Flow; Analytical Development in Mechanisms, Applied Mechanics, and

NUCLEAR ENGINEERS We Will Train Graduate Mechanical, Electrical and Chemical Engineers with Analytical and Design Talents to Assume Capacities as Nuclear Engineers.

RADIO CHEMISTS To Perform and Supervise Analysis for Fission Products, Transuranic Elements and Other Activities.

#### **NEW ATOMIC EDUCATION PROGRAM**

1. Atomic Power Fellowship Program in conjunction with the University of Pittsburgh for selected engineers and physicists permits qualified personnel to obtain MS or PhD degrees, while receiving FULL PAY.

2. Westinghouse will also pay one-half of the tuition for part-time graduate courses completed for all technical employees. The other half will be refunded when an approved advanced degree is earned.

#### SALARIES OPEN

Starting salaries depend on your education and experience. Ample attractive housing reasonably priced in modern suburban community 15 minutes from plant.

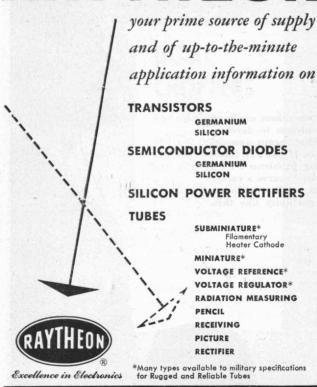
Send Complete Resume Today To:

MR. A. M. JOHNSTON **WESTINGHOUSE BETTIS PLANT** P.O. Box 1468, Pittsburgh 30, Penna.

# Vestinghouse First in Atomic Power



### RAYTHEON



#### RAYTHEON MANUFACTURING COMPANY

Receiving Tube Division — Home Office:
55 Chapel St., Newton 58, Mass. Blgelow 4-7500
For Application Information Write Or Call The Home Office Or:
4935 West Fullerton Avenue, Chicago 39, Illinois, NAtional 2-2770
589 Fifth Avenue, New York 17, New York, Plaza 9-3900
622 South La Brea Ave., Los Angeles 36, California, WEbster 8-2851



Write for Free Brochure on:

- Piling
   Pile Shells
   Pile Fittings
- Prefabricated Piping

SPEED-LAY System

S. G. Albert '29

ALBERT pipe supply co., inc.

BERRY AT NORTH 13TH ST. • BROOKLYN 11, N. Y.

#### THE TABULAR VIEW

(Concluded from page 126)

is now Roxbury. The progress of this settlement — which attracted such persons as Nathaniel Hawthorne and Charles A. Dana—is traced (page 141) by Gorham Dana, '91. Born in Charlestown, Mass., and educated in the public schools of Boston, Mr. Dana entered the Institute to study Civil Engineering, and is secretary of the Class of 1891. For many years he was manager of a fire protection bureau. In 1928 he was coauthor with William D. Milne, '08, of a book entitled *Industrial Fire Hazards*, and in 1914 wrote *Automatic Sprinkler Protection*, which enjoyed a good sale among fire protection engineers. Mr. Dana retired in 1939.

Secondary Education. — As more and more youngsters reach the teen age and crowd existing high school facilities to the limit, secondary school education comes under increasing scrutiny. A teacher of high school science points out (page 144) her belief that the primary need in improving precollege training is the establishment of an environment, within the community, conducive to discipline and intellectual achievement of reasonably high caliber. BERTHA S. W. DODGE received the S.M. degree in Chemistry from the Institute in 1922, and has had varied experience in teaching college mathematics as well as high school science. In addition, two grown daughters have contributed to Mrs. Dodge's understanding of young people and their educational needs. In addition to "Unconscious Ambassadors" which appeared in The Review for February, 1943, Mrs. Dodge has written an elementary textbook on chemistry for use in teaching student nurses, and is author of The Story of Nursing, published in April, 1954, by Little, Brown and Company.



#### GEARS

Made to Your Specifications

You and we can form a team—you to draw up the specifications; we to make the gears—that will be profitable to both of us. Gears of all types, all sizes, all materials. Design-engineering service available.

Custom Gears Exclusively

DIEFENDORF GEAR CORPORATION

Syracuse 1, N. Y.

# DIEFENDORF GEARS



# Reaching for the moon

Once it meant the impossible...

today it's a progress report on scientific research

Who dares call anything impossible today? Not when research scientists are constantly seeking and finding new wonders to improve the way you live.

ONLY A DREAM YESTERDAY... reality today. A generation ago, Union Carbide scientists began taking oil and natural gas apart and putting the pieces together again in ways unknown to nature.

The result? A steady stream of entirely new chemicals . . . an average of one a month for the past 25 years. The benefits of these petroleum chemicals are everywhere—man-made textile fibers, amazing plastics, life-saving wonder drugs, enduring paints and enamels . . . the list is endless.

NOT ONLY CHEMISTRY has felt the touch of Union Carbide research. Alloying metals that make possible

stainless and other fine steels, oxygen from the air for medical and industrial use, a variety of carbon products—all have been developed, made better or more abundant through UCC research.

**AND THE MOON?** The work of Union Carbide scientists in new metals such as titanium, in rocket fuels, and in the beneficial uses of atomic energy, is helping man reach in that direction, too.

STUDENTS AND STUDENT ADVISERS: Learn more about career opportunities with Union Carbide in Alloys, Carbons, Chemicals, Gases, and Plastics. Write for "Products and Processes" booklet.

## Union Carbide

AND CARBON CORPORATION
30 EAST 42ND STREET NEW YORK 17, N. Y.

In Canada: UNION CARBIDE CANADA LIMITED, Toronto

UCC's Trade-marked Products include-

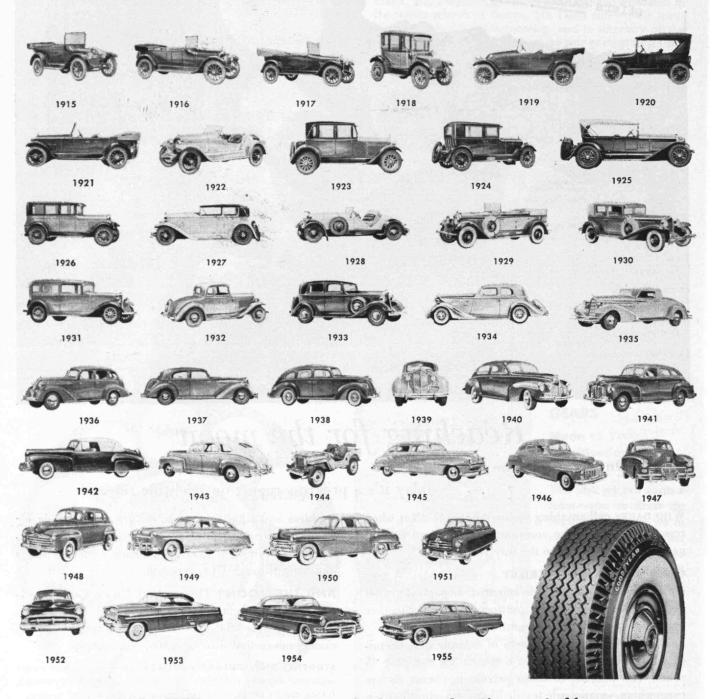
SYNTHETIC ORGANIC CHEMICALS PRESTONE Anti-Freeze
Dynel Textile Fibers ELECTROMET Alloys and Metals
LINDE Silicones BAKELITE, VINYLITE, and KRENE Plastics

EVEREADY Flashlights and Batteries PREST-C HAYNES STELLITE Alloys UNION Carbide NATIONAL Carbons ACHESON Electrodes

PREST-O-LITE Acetylene ide LINDE Oxygen odes PYROFAX Gas

JANUARY, 1956

# Again...one of the most remarkable votes of public confidence in the history of American industry



Again in 1956 . . . as in every single year for the past 41 years:

MORE PEOPLE RIDE ON GOODYEAR TIRES THAN ON ANY OTHER KIND!



GOODFYEAR

# THE **TECHNOLOGY** REVIEW

TITLE REGISTERED, U. S. PATENT OFFICE

EDITED AT

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY



H. Armstrong Roberts "Mmmm. Walker food has improved.

Editor:

B. DUDLEY

Business Manager:

R. T. JOPE

Circulation Manager:

D. P. SEVERANCE

Editorial Associates:

PAUL COHEN

J. R. KILLIAN, JR. F. W. NORDSIEK

J. J. ROWLANDS

Editorial Staff:

RUTH KING

Business Staff:

EILEEN E. KLIMOWICZ

MADELINE R. McCORMICK

Publisher:

H. E. LOBDELL

Published monthly from November to July inclusive on the twenty-seventh of the month preceding the date of issue, at 60 cents a copy. Annual subscription, \$4.50. Published for the Alumni Association of the M.I.T.: Dwight C. Arnold, President; H. E. Lobdell, Executive Vice-president; Gilbert M. Roddy, John J. Wilson, 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 mall matter at the Post Office at Bristol, Conn. Copyrighted, 1956, 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.

VOL. 58, NO. 3

JANUARY, 1956

#### CONTENTS

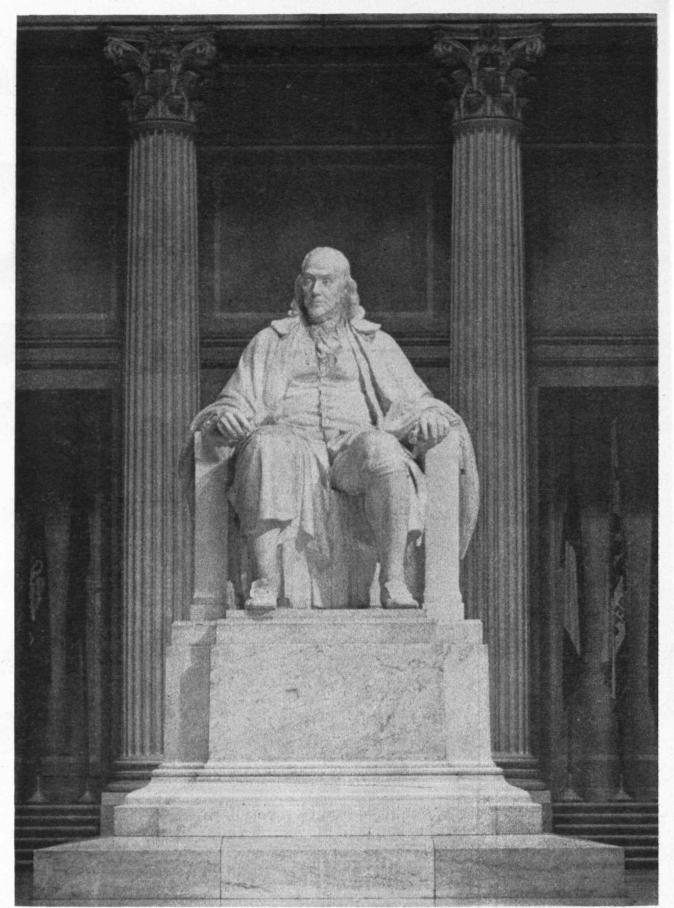
WINTER ON BEACON HILL
PHOTOGRAPH BY RAYMOND E. HANSON THE COVER
BENJAMIN FRANKLIN STATUE AT THE FRANKLIN INSTITUTE IN PHILADELPHIA
PHOTOGRAPH BY HAROLD M. LAMBERT FRONTISPIECE 13:
THE PLACE OF THE SMALL LIBERAL ARTS COLLEGE BY JAMES S. COLES 13
With growing emphasis on mass educational methods, the small liberal arts college is able to provide an intellectual environment that recognizes and develops the individual
BROOK FARM By Gorham Dana 14
A century ago many communal settlements sprang up in the United States, then withered away. The inherent defects of communal living are brought to focus by examining the history of one of the most brilliant and promising of these socialistic experiments
DO TAXPAYERS WANT INTELLECTUAL EMINENCE? By Bertha S. W. Dodge 14
In the view of one high school teacher of science, America's public school system too ofen creaks at the joints because the

teacher is expected to do everything - but teach!

tute of Technology .....

THE TABULAR VIEW • Contributors and Contributions . . . . . . . 126 THE TREND OF AFFAIRS • News of Science and Engineering . . . . 133

THE INSTITUTE GAZETTE • Relating to the Massachusetts Insti-



Harold M. Lambert

Benjamin Franklin

. . . rose to international eminence as writer, printer, scientific investigator, inventor, patriot, and statesman in the American Colonies. This statue, at the Franklin Institute in Philadelphia, provides a fitting frontispiece illustration in celebration of the 250th anniversary of Franklin's birth on January 6, 1706 (January 17, new style) in a two-story house on Milk Street in Boston.