TECHNOLOGY REVIEW December 1958



the worse the situation...

the more reason for using **TIREX**®

TIREX cords and cables give longest service when <u>not</u> subjected to severe abuse. But when required, TIREX <u>can take it</u>. In snow and mud, under water and under pressure, TIREX cords and cables remain flexible, smooth, light and easy to handle, thanks to their original <u>cured-in-lead</u> construction. They won't snag or tear, and their fortified and tempered neoprene armor gives balanced resistance to abrasion, water, acids, oils, sunlight and flame.

Millions of feet of TIREX are on the job everywhere – transmitting power for mobile mining equipment, construction machinery and portable tools.



"The American manufacturers of transoceanic telephone cables"





Stratton Elected President of M.I.T. Killian Becomes Chairman of Corporation Bush Takes New Post as Honorary Chairman

A CTINC on the recommendation of James R. Killian, Jr., President of the Massachusetts Institute of Technology since 1948, the M.I.T. Corporation appointed Julius A. Stratton, now Chancellor and Acting President, to be the next President of the Institute, effective January 1, 1959.

Dr. Killian, who continues on leave as Special Assistant to President Eisenhower, was at the same time elected Chairman of the Corporation, a post to which he will devote full time when he returns in the future from his service in Washington.

Vannevar Bush, who has served as Chairman of the Corporation for the past two years, was elected Honorary Chairman of the Corporation.

The elections, confirming recommendations presented by its Executive Committee, were made at the regular meeting of the Corporation on December 1, and announced at a special convocation of the Faculty following the meeting of the Corporation.

In commenting on Dr. Stratton's appointment as President and Dr. Killian's election as Chairman of the Corporation, Dr. Bush said:

"Last October Dr. Killian suggested to the Corporation, as he had earlier done to members of its Executive Committee, that because of his continuing leave status and other considerations he wished to relinquish the Presidency of the Institute whenever a successor could be appointed. The Corporation, in response, indicated its conviction that the Institute now has indispensable need for two full-time senior officers, the Chairman of the Corporation and the President as Chief Executive Officer. The Corporation also suggested that it proceed to appoint a new President and that when Dr. Killian returned from his leave in Washington he come back as full-time Chairman of the Corporation, a post that would enable him to concentrate on those aspects of the Institute's program that look outward rather than inward and that would be concerned with the over-all trustee policy and to share with the President the formulation of institutional goals.

"In seeking a new President of the Institute, the Corporation and its Executive Committee consulted with senior representatives of the Faculty and of the Alumni Association. We came enthusiastically and unanimously to the conclusion that Dr. Stratton was superbly qualified to succeed Dr. Killian as President, that he would have the enthusiastic support of the M.I.T. community, and that the Institute would be fortunate if Dr. Stratton would accept an invitation to serve as President. I am very happy that he has accepted the appointment.

"The Corporation, in electing Dr. Killian as Chairman, granted him leave of absence in this new post in recognition of his continuing important responsibilities in Washington, but in so doing, reaffirmed the urgent need for Dr. Killian to return to the Institute in order to assume his new duties full time at the earliest appropriate date."

In commenting on Dr. Stratton's election to the Presidency of the Institute, Dr. Killian said:

"Dr. Stratton's election recognizes his immense contributions to M.I.T. and his leadership in science and education, both at M.I.T. and nationally. He possesses to an extraordinary degree those qualities of mind, and character, and spirit, which are required for an outstanding academic administrator and specifically for the Presidency of M.I.T.

"Dr. Stratton and I have long worked together with a sense of common purpose and extraordinary concert on policy. In this fortunate fact lies the best assurance that the new administrative arrangements will work happily and well. One of the principal responsibilities of a chief executive is to set the stage for succession, to insure future leadership of the highest possible caliber for the institution. I am happy and confident that this has been done.

"I am confident of his success as President and of the loyal support of his colleagues, as I am grateful to him and to them for their generous cooperation with me during the eighteen years that I have carried major responsibilities in connection with the M.I.T. President's Office, ten of them as President.

"For some months it has been my plan and conviction that, if agreeable, I would like, at an appropriate time, to shift to the Chairmanship of the Corporation, following the precedent of Dr. Karl Taylor Compton, who became Chairman when he went to Washington in 1948 as Chairman of the Research and Development Board of the Department of Defense, and I became President. My continuance on a leave status, and the availability of Dr. Stratton, make this change appropriate now and assure that there be no loss of momentum in the administration of the Institute because of my leave.

"As Chairman of the Corporation I can serve the Institute in a way that will draw most effectively on my experience and afford me special opportunities to do all within my power further to promote the usefulness of this institution, especially to help secure for it those additional resources and facilities its great and growing responsibilities so urgently require."

Dr. Killian's present assignment is one of international significance and is bound to have beneficial effect when he returns to the Institute.

Dr. Stratton has the Review's best wishes, wholehearted cooperation, and sympathetic understanding as he becomes the eleventh President of M.I.T.





A-C Linear Accelerometer, Type LA-600, for aircraft and missiles. Shown actual size.

NEW LINEAR ACCELEROMETER FEATURES FRICTIONLESS OPERATION for greater accuracy, ruggedness and reliability

In the Honeywell A-C Linear Accelerometer, Type LA-600, friction introduced through bearings and potentiometer slide wires is eliminated. This unit consists of a non-pendulous seismic mass supported on a frictionless spring suspension and incorporates an a-c variable reluctance type pick-off.

Inherently insensitive to cross-coupling accelerations both when at null and when at an acceleration along its sensitive axis, the Type LA-600 also features magnetic damping for near-constant damping ratio throughout its wide range of operating temperatures. Mechanical stops prevent damage from input accelerations beyond the specified full scale range. Write for Bulletin LA-600, Minneapolis-Honeywell, Boston Division, Dept. 1, 40 Life Street, Boston 35, Mass.



DE	SCRIPTIVE DATA
FULL SCALE RANGE:	±0.5 to ±40 G
FULL SCALE OUTPUT:	Up to 10v, 400 cps into 100 K load; Up to 8v 400 cps into 10 K load
THRESHOLD-RESOLUTION:	.0001G
CROSS-AXIS SENSITIVITY:	.005G maximum
VIBRATION:	10G, 0-2000 cps
SHOCK:	Up to 60 G
WEIGHT:	1.2 pounds maximum

THE TECHNOLOGY REVIEW, December, 1958, Vol. LXI, 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 TIME INDICATOR UNIT

accurate to 1 second in 12 days



TIMES MODEL TS-3 CHRONOMETER

Program timer, pulse generator and clock. Timing assemblies, driven by the clock motor, provide momentary contact closings at rate of

• ONCE A SECOND • ONCE A MINUTE • ONCE AN HOUR

also optional frequency or pulse outputs as specified in range between 10 and 1000 cps.

PRICE: \$950.00, F.O.B. Factory.

Optional frequency output, \$50.00 each.

Write for details.

TIMES FACSIMILE CORPORATION 540 West 58th Street, New York 19, N. Y. A. G. Cooley Class of 1924

THE TECHNOLOGY REVIEW



REQUIRED: A lightweight, low-loss, radiation-free cable with electrical uniformity for interconnecting the navigation and communication antenna circuits of the Douglas Aircraft Co.'s new DC-8 jet airliner.

SPECIFIED: Foamflex Coaxial Cable



A semi-flexible cable with tubular copper inner conductor, foamed polyethylene dielectric and commercially pure aluminum outer conductor.

With outstanding advantages for use in aircraft navigation, communication and warning circuits that include:

- 1. Twice the efficiency of solid dielectric $(RG-8^{A}/_{U})$ type of cable now in general use.
- 2. Extended life characteristics that permit permanent installation and assure electrical stability during the life of the plane.
- **3.** Good frequency response over wide temperature variations; capable of withstanding highest summer ground temperatures, as well as extremely low temperatures found at high altitudes.
- **4.** Greater efficiency and improved system performance without the use of additional electronic components.
- 5. Ability to operate in both pressurized and non-pressurized parts of a plane without the use of cable dehydrators or pressurizing systems.
- 6. Lighter and smaller than many cables now installed in aircraft.

Foamflex coaxial cable is supplied in long lengths on lightweight, disposable reels. For further information or inquiries, write Dept. FC.



PHELPS DODGE COPPER PRODUCTS CORPORATION

300 PARK AVENUE, NEW YORK 22, N.Y.



PHYSICISTS

ENGINEERS

MATHEMATICIANS

are invited to join the Lincoln Laboratory scientists and engineers whose ideas have contributed to new concepts in the field of electronic air defense.

A brochure describing the following Laboratory programs will be forwarded upon request.

HEAVY RADARS MEMORY DEVICES TRANSISTORIZED DIGITAL COMPUTERS SCATTER COMMUNICATIONS SOLID STATE AEW (air-borne early warning) SAGE (semi-automatic ground environment) SYSTEMS ANALYSIS

In certain of these programs, positions of significant professional scope and responsibility are open to men and women with superior qualifications.



Research and Development

LINCOLN LABORATORY BOX 28 LEXINGTON 73, MASSACHUSETTS

MIT

THE TABULAR VIEW

Learning by Doing.—A co-operative program for leading students in geophysics is described (page 83) by ROBERT R. SHROCK, Head of the Institute's Department of Geology and Geophysics. This program, initiated in 1951 by Professor Shrock and Cecil H. Green, '23, is a modern example of the William Barton Rogers' philosophy of combining theoretical studies with practical application. During the first summer program managed by Geophysical Service, Inc., all students came from M.I.T. However, the co-operative program proved to be so successful that other colleges clamored for opportunity to participate, and nationwide support came from other firms engaged in geophysics or related activities.

A native of Indiana, Professor Shrock received the A.B., A.M., and Ph.D. degrees in geology from the University of Indiana in 1925, 1926, and 1928, respectively. He taught at the University of Wisconsin from 1928 until 1937 when he joined the M.I.T. Faculty as assistant professor. He became associate professor in 1943, was promoted to full professor in 1949, and that year became head of the Department of Geology. He is consultant for various mining, petroleum, and engineering companies, museums, and state geological surveys. He conducted important geological field studies in Haiti, the Dominican Republic, Cuba, Jamaica, and Mexico, as well as in the United States. Dr. Shrock is also widely known for his contributions to the literature of geology. He is author of many technical papers and books, including Invertebrate Paleontology (with William H. Twenhofel), Index Fossils of North America (with Hervey W. Shimer), and Sequence in Layered Rocks.

Professor Shrock gives much credit for the establishment of the co-operative course for geophysicists to Dr. Green. Dr. Green is a graduate of the Institute's Co-operative Course in the Department of Electrical Engineering. He is president of Geophysical Service, Inc., a director of Texas Instruments, Inc., and is a special term member of the M.I.T. Corporation.

Life Is Colorful. - Whether the observed coloration is due to the scattering or interference of light, or whether it is attributable to pigments within the living substance, color plays a persistent and important role in nature. In fact, as FREDERIC W. NORDSIEK, '31, notes in "Life Is Colorful" (page 89) nowhere else do beauty and utility so closely intermingle as in the colors of the living world, and without its myriad colors, life would not be merely dull-it would be impossible. If the green of chlorophyll is the characteristic color of the plant world, then the red of hemoglobin is the primary color of the animal world; for all of the vertebrates - and many lower animals – have blood containing the red pigment of hemoglobin, although a few sea animals are "blue bloods." In many cases, the protective coloring of animals may be a lifesaver in making them inconspicuous to their enemies; in other instances, however, colors and their patterns play a significant role in courtship, and hence in survival of the species.

A native of New York Mr. Nordsiek received the S.B. degree in Biology and Public Health from M.I.T. in 1931. Since then he has had wide experience in research and administration in the food industry and in public health activities. From 1943 to 1951, he was assistant director, Research Service Department of Standard Brands, Inc. Since 1951 he has been associated with the American (Concluded on page 70)

CHECK POINTS FOR CHOOSING AN ENGINEERING FIRM-PICK ONE THAT'S SET UP TO OPERATE IN THE COUNTRY WHERE YOU'LL BUILD

Choose a firm with a world-wide organization — one staffed, equipped and experienced to cope with the local situation wherever you plan to construct your new chemical plant, petrochemical plant or petroleum refinery.

Lummus' staff of highly trained employees is located in seven engineering offices throughout the world. This brings five advantages to Lummus customers:

(1) Lummus is set up to operate with local currencies, can arrange payment to suit the customer's desires. (2) Purchasing is world-wide, takes advantage of local conditions. (3) Construction proceeds smoothly to on-time completion because Lummus is expert in training local working people and using local sub-contractors all over the world. (4) Lummus keeps up to date on technical developments everywhere in the world. And (5), each Lummus office can draw on the technical experience and planning ability of all the other offices.

Call in Lummus when you begin plans for your next plant.



LUMMUS' WORLD-WIDE, WORLD-WISE ORGANIZATION



ABOVE — Location of Lummus offices and subsidiaries around the globe BELOW — A few of the far-flung projects designed and constructed by Lummus

Project

- Tetramer, Cumene and Phenol-Acetone Units, Societe des Chimiques des Derives du Petrole
- Sulfuric Acid Plant, Inland Chemicals Canada Limited
- High Pressure Acetylene Chemicals Plant, General Aniline & Film Corp. Phenol-Acetone Plant, Progil-Electro-
- chimie Ethylene Oxide Plant for Petrochemi-
- cals Ltd.

CHEMICAL PLANTS

COMPLETE REFINERIES

Location

Antwerp, Belgium

- Fort Saskatchewan, Alberta, Canada Calvert City, Kentucky, U.S.A.
- the only, nontucky, 0.
- Pont de Claix, France
- Partington, England

Irish Refining Co., Ltd. Burmah-Shell Oil Company Societe Generale des Huiles de Petrole Compañia Shell de Venezuela Standard Oil Company (Indiana)

Cork, Ireland Bombay, India Dunkirk, France Cardon, Venezuela Mandan, North Dakota, U.S.A.

WASHINGTON, D. C. • CHICAGO • HOUSTON • MONTREAL • CARACAS • MARACAIBO • LONDON • PARIS • THE HAGUE

DECEMBER, 1958

69



We develop special equipment and machines from ideas to blueprints — to prototypes — to pilot plants — to the final product or process. Our technical staff and plant facilities are geared to handle the most intricate jobs all the way from small scale laboratory equipment up to contracts in excess of \$1,000,000

Phone TWinbrook 3-6800 or write to:



For a comprehensive summary of our work and the equipment we make, write for our brochure "Process Equipment".

Designers and manufacturers of

AUTOCLAYES · CONDENSERS AND HEAT EXCHANGERS · DISTILLATION EQUIPMENT · EXPERIMENTAL EQUIPMENT · EVAPORATORS · JACKETED KETTLES · MIXERS · PIPE, PIPE COILS, AND BENDS · REACTORS · SPECIAL MACHINERY · TANKS



THE TABULAR VIEW (Concluded from page 68)

Cancer Society. His work deals with organizing and administering research grants programs.

Mr. Nordsiek has been an editorial associate of The Review since 1944, for which he has written more than 100 feature articles and unsigned shorter pieces. In addition, articles by him have appeared in such publications as Encyclopaedia Britannica year books, Encyclopedia Americana, Science Digest, American Journal of Public Health, Appalachia, Nature Magazine, and Food Engineering.

Conquest of Typhus Fever. - From time to time in past issues of The Review, JAMES A. TOBEY, '15, has discussed the role which various diseases and epidemics have played in changing the course of history. Dr. Tobey's discussion in this issue (page 93) deals with the conquest of typhus fever. Of particular significance to Review readers is his mention of the serious epidemic of typhus fever which raged in Serbia in 1915, and which was finally brought under control through efforts of the American Red Cross Sanitary Commission to Serbia. More than half of the members of this Commission were Technology Alumni who had either studied bacteriology or sanitary engineering at the Institute, or had been graduated from the Harvard-Technology School for Health Officers. Among the members of this Commission was Dr. Stanley H. Osborn, '15, through whose co-operation The Review is happy to be able to publish the illustration of the members of this Commission as they were about to leave New York.

A native of Quincy, Mass., Dr. Tobey attended Roxbury Latin School, and came to M.I.T. where he received the S.B. degree in 1916. He received an LL.B. degree from Washington Law School in 1922, an M.S. from American University in 1923, the Dr. P.H. degree from M.I.T. in 1927, and the LL.D. from Southeastern University in 1938. His professional life has been spent in advancing public health and laws affecting it. He has lectured at M.I.T., Yale, Harvard, and Columbia, and has served in the Army's Medical Service. Colonel Tobey has written more than 100 articles, about 20 pamphlets, many books, and numerous Review articles.



Alfred T. Glassett, '20, President