

TECHNOLOGY

REVIEW *November 1958*



Right off the Wire

A miniature record player only four by eight inches is capable of playing twelve inch records.

The record of many thousands of electrical installations shows that the use of TIREX cords and cables provides an extra measure of employee safety.

A new process removes helium from natural gas, in which it is a contaminant, by passing the gas through glass pipes, through the walls of which the helium is filtered.

An atomic-powered train has been designed that will travel across country without tracks. It has fifty-two wheels, each of which is electrically driven.

The plastic base of a new electric coffee pot completely encloses and waterproofs both heating element and thermostat.

Titanium alloyed with rana-dium, chromium and aluminum makes a new alloy that is said to have the greatest strength for its weight of any structural material.

A complete picture, ready for transmission, is provided by a new transistorized television camera. It weighs only four pounds, including self-contained control and synchronizing units.

A radio telescope over four-hundred feet in diameter is planned for the hills of West Virginia.

Weather information can be transmitted over a thousand-mile range by an automatic radio station which can be dropped anywhere by an airplane.

An automatic electronic inspection machine makes a four-way check of automobile valves at the rate of 3,000 per hour with a tolerance of five millionths of an inch.

An adhesive has been developed that will retain a metal-to-metal bond at temperatures as low as - 253 degrees C.

All cords and cables give better service when handled properly. TIREX® portable cords and cables, although jacketed with fortified and tempered neoprene armor and "lead cured" for toughness and smoothness, will give still longer service if not subjected to unreasonable abuse.

By making jet nozzles radioactive and measuring the radiation from the fuel passing through them, the amount of wear can be measured to within one millionth of a gram per hour.

Further information on these news items and on Simplex cable is available from any Simplex office. Please be specific in your requests.

A miniature battery which is reported to last for five years, uses the radioisotope Promethium 147. It is suitable for hearing aids, watches or missile guidance systems.

In California, it is proposed to use underground steam to generate electricity as is being done in Italy and New Zealand. Wells are now being drilled and a yield of 100,000 kilowatts is anticipated.

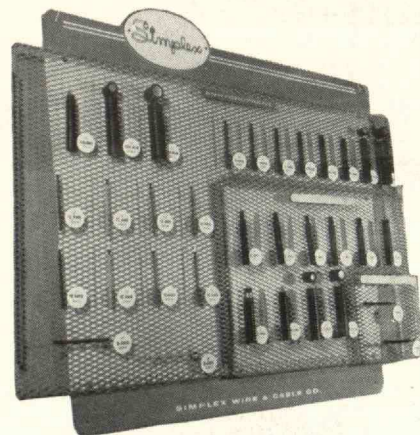
Two radio manufacturers have built extra service into their sets. One warns of approaching tornadoes and the other acts as a radiation detector.

Deuterium, or heavy hydrogen, is concentrated by some bacteria from sea water. This discovery may lead to a new and inexpensive method of producing the heavy water used in reactors.

The area behind the eye that can not be examined by other instruments can now be seen by a device that uses penetrating sound waves and converts their reflection into light.

A disposable medicine container of heat-proof plastic doubles as a hypodermic syringe.

Our atmosphere at an altitude of sixty miles is now known to contain chemicals which could serve as an unlimited fuel supply for ramjet engines.



What's in a name?

The character and business integrity of distributors are measured to a great extent by the products they handle. More than 1000 of the nation's most successful electrical firms — offering the utmost in customer service and satisfaction — recommend and sell Simplex TIREX cords and cables.

SIMPLEX WIRE & CABLE CO.
Cambridge, Massachusetts and
Newington, New Hampshire

Simplex

Highest quality cables for: Mining
Power & Lighting • Construction
Transportation • Communications
Signalling



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

NEGLECTIBLE
CROSS COUPLING

A-C VARIABLE
RELUCTANCE PICK-OFF

MAGNETIC
DAMPING

OPERATING
TEMPERATURE -65°F to +250°F

NO WARM-UP
TIME REQUIRED

HERMETICALLY
SEALED

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.

Honeywell



Military Products Group

DESCRIPTIVE 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

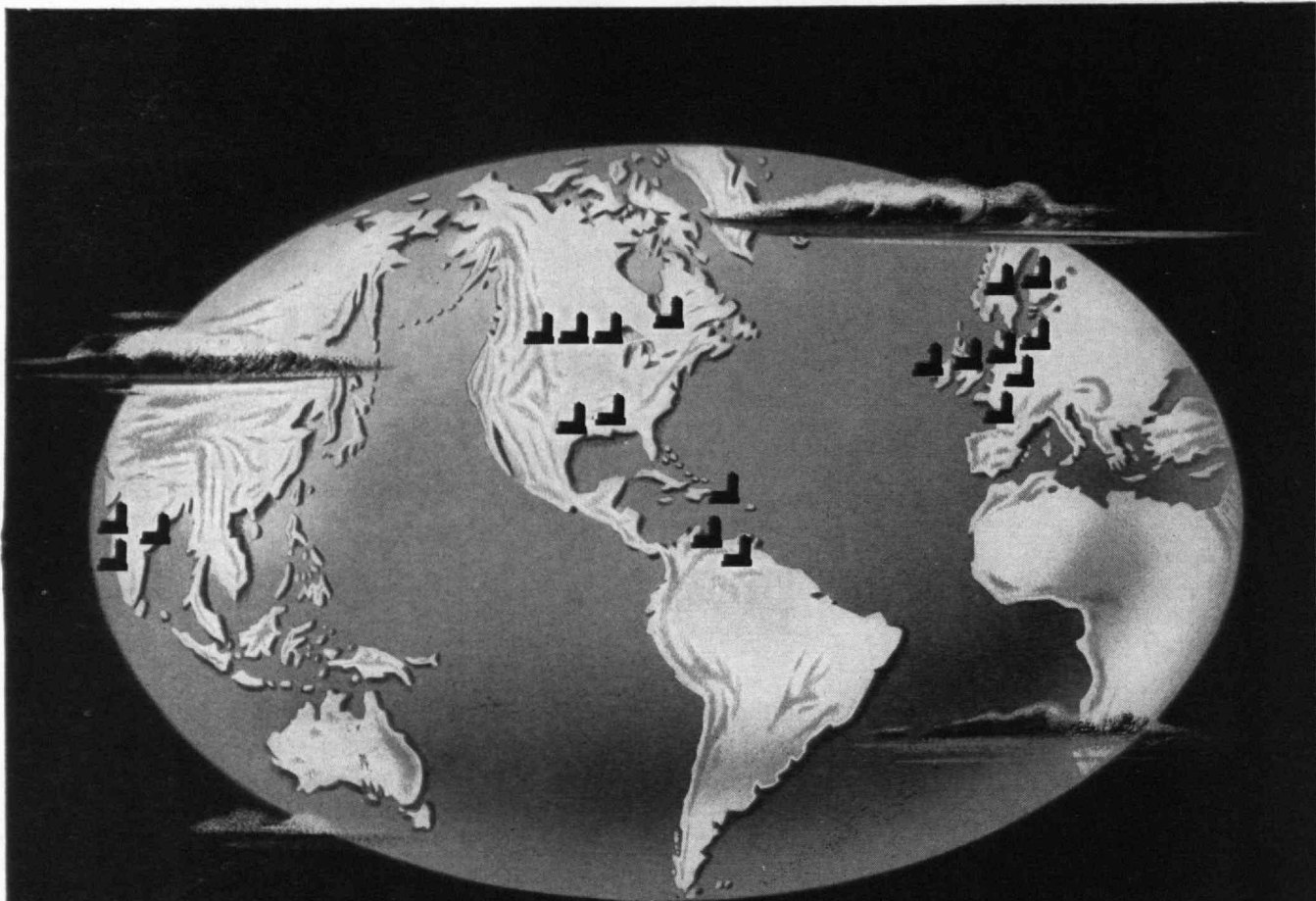
THRESHOLD-RESOLUTION: .0001G

CROSS-AXIS SENSITIVITY: .005G maximum

VIBRATION: 10G, 0-2000 cps

SHOCK: Up to 60 G

WEIGHT: 1.2 pounds maximum



LUMMUS ENGINEERS AND CONSTRUCTS 20 COMPLETE REFINERIES SINCE END OF WORLD WAR II

World-wide Lummus Organization also completed hundreds of other units in same period . . . From Cardon, Venezuela, to Bombay, India—from Corpus Christi, Texas, to Turku, Finland—this string of modern “grass-roots” refineries testifies to the engineering skill of the Lummus staff. That staff includes over 3,000 permanent employees, located in seven branch offices and subsidiaries throughout the world.

When you plan a new facility—oil refinery, chemical or petrochemical plant—Lummus can put 50 years of experience on more than 700 process-industry plants throughout the world to work for you.



1. Refinery for Compañía Shell de Venezuela at Cardon, Venezuela
2. Refinery for Koppstrans Oljeaktiebolag at Gothenburg, Sweden
3. Refinery for Venezuela Gulf Refining Company at Puerto La Cruz, Venezuela
4. Refinery for Societe Generale des Huiles de Petrole at Dunkirk, France
5. “Portable” refinery for U. S. Navy Department
6. Lube oil refinery for Cit-Con Oil Corporation at Lake Charles, Louisiana
7. Refinery for International Refineries Inc. at Wrenshall, Minnesota
8. Refinery for Vacuum Oil Company Ltd. at Coryton, England
9. Refinery for Burmah-Shell Oil Company at Bombay, India
10. Refinery for Standard-Vacuum Oil Company at Bombay, India
11. Refinery for Standard Oil Company (Indiana) at Mandan, North Dakota
12. Refinery for Suntime Refining Company at Corpus Christi, Texas
13. Refinery for Commonwealth Refining Company at Ponce, Puerto Rico
14. Refinery for Esso Standard Oil Company at Antwerp, Belgium
15. Refinery for Caltex at Visakhapatnam, India
16. Refinery for Neste Oy at Turku, Finland
17. Refinery for Irish Refining Co., Ltd., Cork, Ireland
18. Refinery for Esso Standard Française, Bordeaux, France
19. Refinery for Purfina Mineraloelraffineria A.G., Duisburg, Germany
20. Refinery for B. P. Canada Limited, Ville d'Anjou, Montreal, P.Q., Canada

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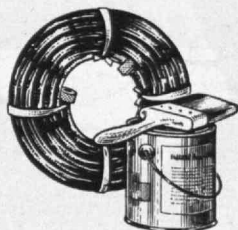
THE TECHNOLOGY REVIEW

... tires or toys



... ribbons or ropes

... house paints or hoses



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Phone: Liberty 2-7300

NEW APPROACH TO "OLD" MATERIALS

By today's standards, the "old" refractory metals are outdated. The ultimate in high-temperature studies of 10 years ago is several generations behind in terms of modern aircraft and missile development.

Today's material requirements surpass anything envisioned 10 short years ago. Molybdenum and beryllium, for example, are still exciting metals with much promise for space vehicles and ultra-high-speed aircraft. It now appears, however, that the full promise of such metals may be fulfilled when they are used, not alone, nor as alloys, but when combined with other materials to form totally new types of structural materials.

Such a "marriage" of metals, ceramics and plastics is a promising approach to high-temperature problems that is being vigorously pursued at Avco. It opens new potential applications for many exotic combinations.

These bold steps forward are possible at Avco, where materials research includes concurrent basic studies and applied research, plus developmental programs that extend through the solution of processing and testing problems.

The search for new knowledge goes forward simultaneously with the creation of advanced technology at Avco's Research and Advanced Development Division. The creative man, whether he is interested in basic studies or practical problems, finds his effort enhanced by the stimulus of interdisciplinary contact and feedback from other related fields.

Research and Advanced Development is more than a descriptive title at Avco. It is a concept that promotes creativity.

AVCO
Research and Advanced Development
division

For information on unusual career opportunities for exceptionally qualified scientists and engineers, write to: Dr. R. W. Johnston, Scientific and Technical Relations, Avco Research and Advanced Development Div., 201 Lowell Street, Wilmington, Mass.



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With six years of experience in producing nuclear fuel to meet the needs of a progressing industry, M & C has developed techniques for manufacturing many types of fuel elements. In addition to fuel assemblies for reactors, M & C supplies the nuclear industry with complete reactor cores, core components, and fabricates a variety of materials into tube, disc, foil and plate forms for nuclear experiments.

M & C Nuclear, Inc. is growing to meet the expanding requirements of the nuclear industry and, as an important part of this growth, scientifically trained people are needed — people experienced in the metallurgical, mechanical, or industrial fields. Experience in atomic energy is desirable, but is not a fundamental requirement.

For more information, write or call the Employment Director.

MIT ALUMNI

| | |
|---------------------------|------|
| Michael Anthony | 1932 |
| Chester Avery | 1923 |
| Frank Binns | 1951 |
| William Clemons | 1950 |
| Kenneth Fettig | 1957 |
| Robert Flanders | 1958 |
| Harold Friedman | 1956 |
| Robert Glidden | 1926 |

| | |
|-----------------------------|--------|
| Herbert Graetz | 2-1944 |
| Daniel Hamilton | 1954 |
| Roger Hood | 1945 |
| Donald Hurter | 1945 |
| Edward Jastram, Jr. | 1935 |
| Peter Lynch, Jr. | 1958 |
| John Medgyesy | 1952 |
| Robert Packard | 1953 |
| Charles Patterson | 1945 |

| | |
|---------------------------------|------|
| John Reynolds | 1952 |
| Robert Seavey | 1942 |
| Frederick Stearns | 1946 |
| A. Graham Sterling, Jr. | 1949 |
| Robert Teeg | 1958 |
| Marvin Turkanis | 1953 |
| George Williams | 1939 |
| Carroll Wilson | 1932 |
| John Wilson | 1941 |

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Triple Lane Tube Layout, with three separate pathways for steam travel, allows the steam to penetrate to the peripheries of all tubes.*

Design like this, typical of C. H. Wheeler engineering, steps up condenser efficiency. Other engineering advancements—such as patented Reverse Flow, which permits flushing away leaves,

twigs, algae and other foreign matter—reduce maintenance requirements. "Zero" condensate temperature depression, pure condensate and deaeration to 0.03 cc. of oxygen per liter (special design provides for deaeration to 0.01 cc. of oxygen per liter) . . . are

additional features you get with C. H. Wheeler Condensers.

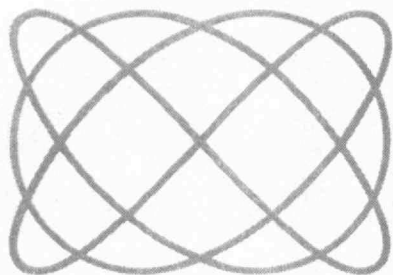
**Location of the air-vapor take-off reduces the resistance to steam passage. This minimizes the depth of steam penetration through the tube bank of all C. H. Wheeler Condensers.*

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Research and Development

MIT

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THE TABULAR VIEW

Report. — Always a stimulating and thought-provoking communication, the Annual Report of the President to members of the M.I.T. Corporation is prepared this year by J. A. STRATTON, '23, Acting President. In devoting a major portion of his significant message to general problems of higher education, Dr. Stratton summarizes (page 29) the plight of American colleges in the words: "The most fundamental problem, and the most difficult with which to cope, is the widening gap between the mean level of academic achievement in the average American secondary school on the one hand and the intellectual maturity of our top graduate professional schools on the other . . . The task of bringing even the most talented undergraduate student, in four years, to such a point of intellectual maturity that he may deal effectively either with the requirements of the top-rate graduate school or with the pressures of modern industry is a great and difficult one." With particular effectiveness since his appointment as Provost at M.I.T., Dr. Stratton has long emphasized quality in education.

Dr. Stratton received the S.B. and S.M. degrees from M.I.T. in 1923 and 1926, respectively, and the D.Sc. degree in 1927 from the Eidgenossische Technische Hochschule of Zurich. He served as a member of the Institute's Faculty for many years, and following World War II established the M.I.T. Research Laboratory of Electronics, and served as its head until 1949 when he was appointed to the newly created post of Provost. He became vice-president in 1951, chancellor in 1956, and acting president in 1957.

(Concluded on page 10)



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*E. H. Olmstead, President
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