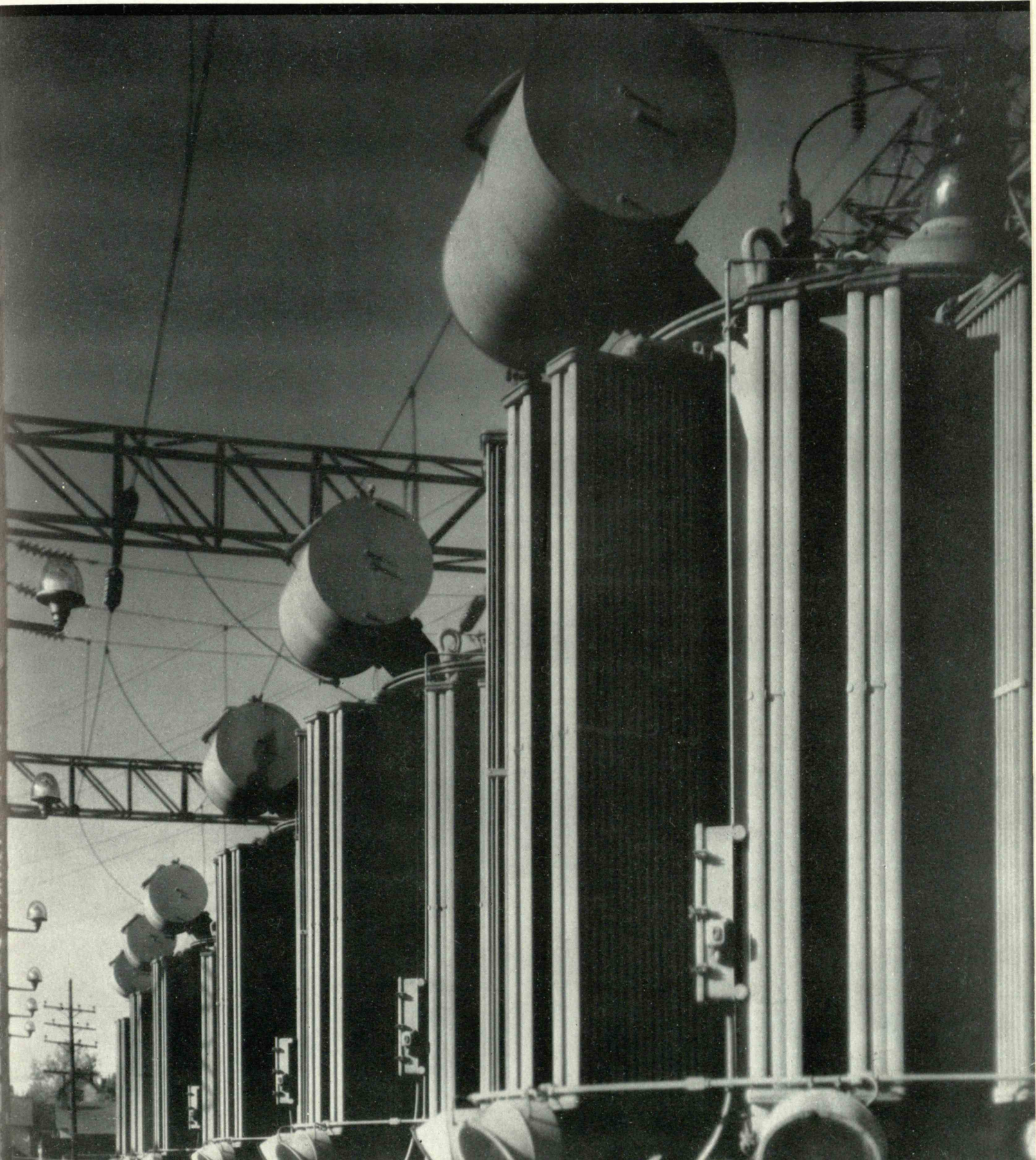
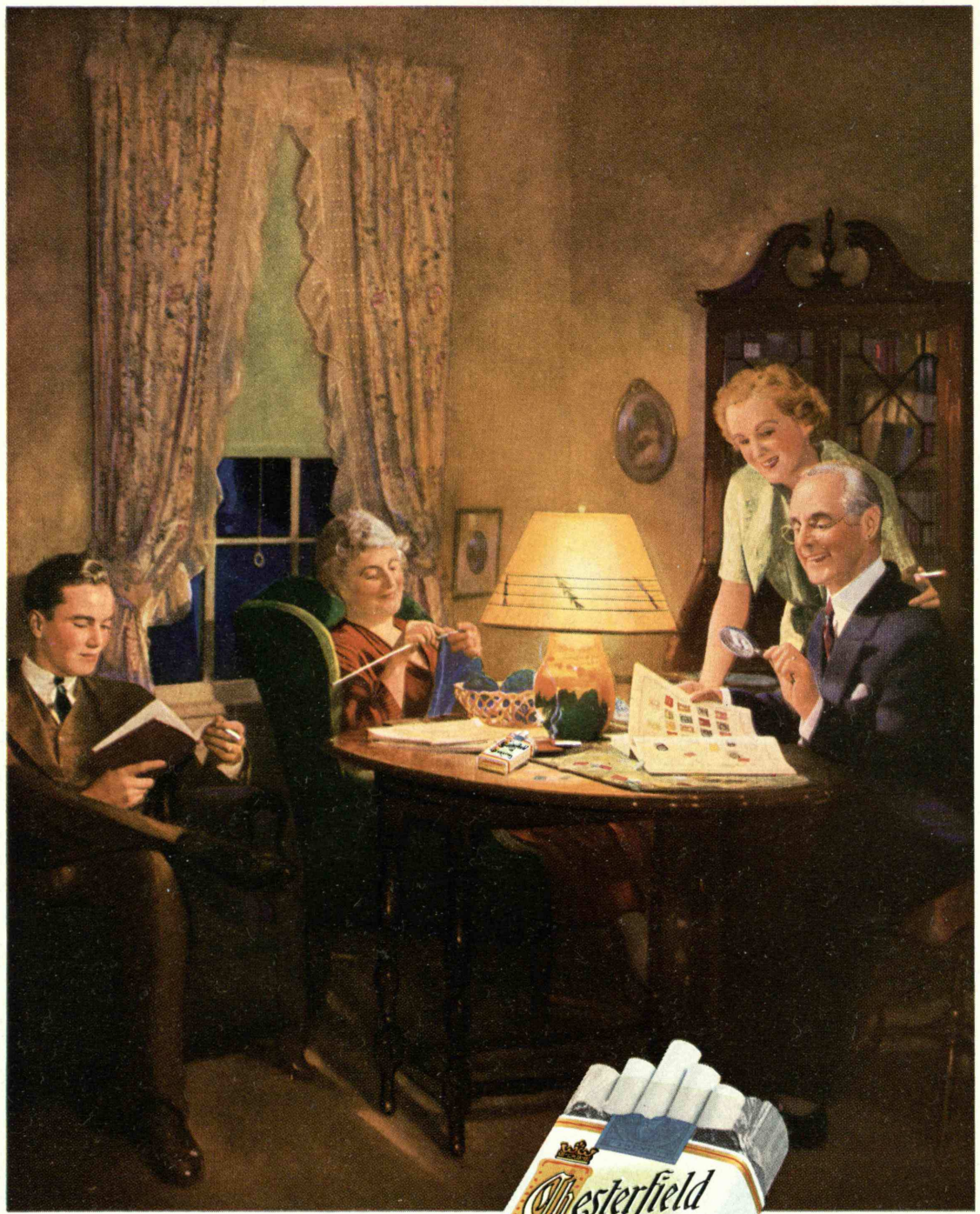


*March 1936*

# TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office





— and Chesterfields  
are usually there



...they're mild  
and yet  
*They Satisfy*

© 1936, LIGGETT & MYERS TOBACCO CO.

THE TECHNOLOGY REVIEW, March, 1936. Vol. XXXVIII, No. 6. Published monthly from October to May inclusive and in July at 10 Ferry Street, Concord, N. H. Publication date: twenty-seventh of the month preceding date of issue. Annual subscription \$3.50; Canadian and Foreign subscription \$4.00. Entered as second-class matter at the Post Office at Concord, N. H., under the Act of March 3, 1879.

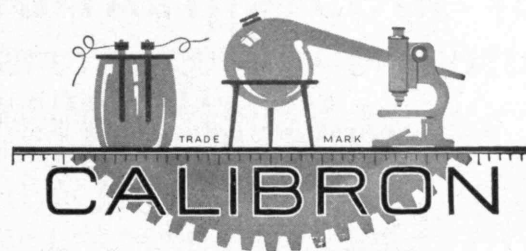
## THE TABULAR VIEW

THE Fifth Edition of "Biographical Directory of American Men of Science," published in 1933, added stars to the names of 250 men regarded by their colleagues as leading scientific workers. One of these was Professor GEORGE R. HARRISON, Director of the Institute's Spectroscopy Laboratory, who came to Technology in 1930 from Stanford University. A contribution on the spectroscope's importance to industry was made by Professor Harrison in these pages in December, 1933 (page 87). The Review is glad to present him again as an author, this time as one who would inspire the atom with a "divine discontent." Professor Harrison, a physicist, is anxious that he be not thought presuming in writing of chemistry. His article was originally prepared for a broadcast sponsored by the Northeastern Section of the American Chemical Society in its notable and successful series of science talks presented in New England.

FORTY years as head of an economics department is a goodly period of time over which to study changing conditions in our world. Preface this by six years of teaching before taking the position of head; add to it such extracurricular duties as service on the Railroad Emergency Board to make investigations into the 1934 disputes between the Southern Pacific Lines in Texas and Louisiana and employees of the company and the disputes between the Mobile and Ohio Railroad Company, the receivers of the company, and its employees. The result is breadth as well as depth of economic knowledge. Such we have in Professor Emeritus DAVIS R. DEWEY. The thousands of Technology students who have known him as an inspiring teacher will welcome, we are sure, his appearance in these pages.

A brother of John Dewey, the eminent philosopher and psychologist, Dr. Dewey is also an author and educator of note. Born in Burlington, Vt., in 1858, Professor Dewey was graduated from the University of Vermont in 1879 with Phi Beta Kappa honors. After teaching for several years in the public schools, he entered Johns Hopkins University as a graduate student, and in 1886 received his doctor's degree. Dr. Dewey became Head of the Department of Economics at the Institute in 1893 and held this position until his retirement in 1933.

FREDERICK G. FASSETT, Jr., Assistant Professor of English at the Institute, has appeared in our pages a number of times. We have mentioned that he comes from Maine; we have expressed appreciation of the course he directs as an option of freshman English to assist men on the staffs of undergraduate publications at M.I.T.; we have credited him, as a co-author with Paul C. Eaton, '27, with the writing of two books, "Practical Writing" and "Studies in Reading"; we have mentioned him as the contributor of a book review in these pages (November, 1935, page 50). We now call to your attention two more book reviews on page 213 of this issue, and, in addition, we introduce you to a poet, page 224. *(Concluded on page 206)*



## GUARANTEED RESEARCH

- A definite price for successful results. There is no charge unless your requirements are met.
- Mechanical and Electrical Engineering / / / Developments, models, production and testing.

**CALIBRON PRODUCTS, INC.**

West Orange, New Jersey



## CAMBRIDGE POT GALVANOMETER

This galvanometer is an inexpensive instrument with the sensitivity of a reflecting galvanometer and the ruggedness of a milliammeter. It requires no levelling or clamping and is accordingly well adapted for general laboratory use.

It is fitted with both a pointer and a reflecting mirror suitable for "null" point indications as well as for use with a lamp and scale. It is only one of many Cambridge Galvanometers.

Send for T Bulletin.

### OTHER CAMBRIDGE PRODUCTS:

Moisture Indicators and Recorders  
Surface Pyrometers  
Galvanometers  
Gas Analysis Equipment  
and other Mechanical and Electrical Instruments.

Physical Testing Instruments  
Laboratory Insts. for A.C. & D.C.  
Engineering Instruments  
Physiological Instruments

**CAMBRIDGE  
INSTRUMENT CO INC**

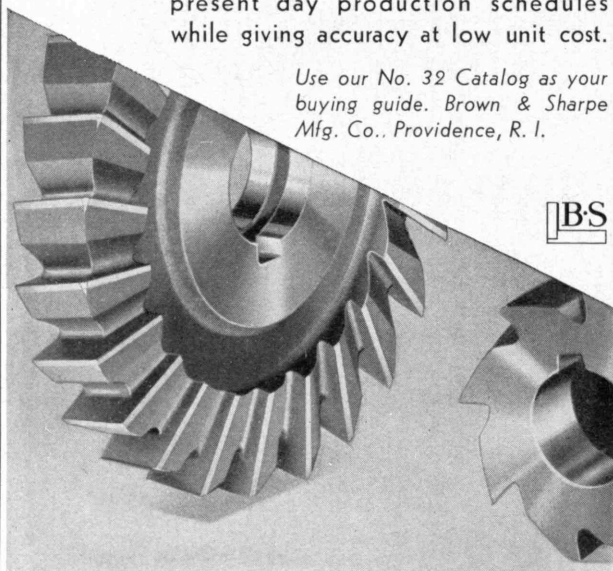
3732 Grand Central Terminal, New York City

## for MODERNIZATION

### COST-CUTTING — PRODUCTIVE CUTTERS

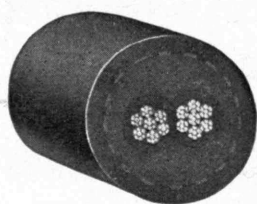
... essential in maintaining present day production schedules while giving accuracy at low unit cost.

Use our No. 32 Catalog as your buying guide. Brown & Sharpe Mfg. Co., Providence, R. I.



**BROWN & SHARPE  
CUTTERS**

## TIREX CABLES



Where flexible cables are furnished as a standard part of any electrical apparatus or where cables already in service must be replaced or renewed TIREX rubber sheathed cables offer long service, freedom from trouble and low maintenance cost. Their selenium cured, sixty percent rubber sheath is the toughest, most wear resisting rubber compound available.

**SIMPLEX WIRE & CABLE CO.**

*Sidney Street, Cambridge A*  
**BOSTON, MASS.**

## THE TABULAR VIEW

*(Concluded from page 205)*

TO Institute Librarian WILLIAM N. SEAVER, who initiated it, and to Miss MARGARET P. HAZEN, who prepared it, we are indebted for the reading list, on page 223, of important scientific books, significant to the layman.

COVER CLUB member No. 2 is ALEXANDER PIAGET, of St. Louis, whose study of a row of transformers at the Page Avenue substation of the Union Light and Power Company, St. Louis, graces the cover of this issue. Mr. Piaget also contributes the frontispiece. As we wrote last month, the amateur photographer, such as Mr. Piaget, who has a print reproduced on our cover has attained, we like to feel, a measure of distinction in his work that warrants special notice. "We propose to give this recognition in this column each month, so far as possible, and by way of doing this, we announce the formation of the Cover Club, the membership of which will include those amateur photographers whose work is printed on the cover."

IN April The Review will present a special issue marking the 75th anniversary of the granting of the Institute's charter. The usual Review coverage of science, engineering, and Technology news will be supplemented by articles on the history of the Institute.

## THE RUMFORD PRESS

Concord, New Hampshire

1 1 1

*Makers of Magazines and Books  
of Distinction*



Industrial and Automotive Brake Lining  
and Clutch Facings—Rubber Belting  
—Hose—Molded Goods—Packing—  
Rubber Rolls and Abrasive Wheels.

**THE MANHATTAN RUBBER MFG. DIVISION**  
OF RAYBESTOS-MANHATTAN, INC.

**EXECUTIVE OFFICES AND FACTORIES, PASSAIC, NEW JERSEY**

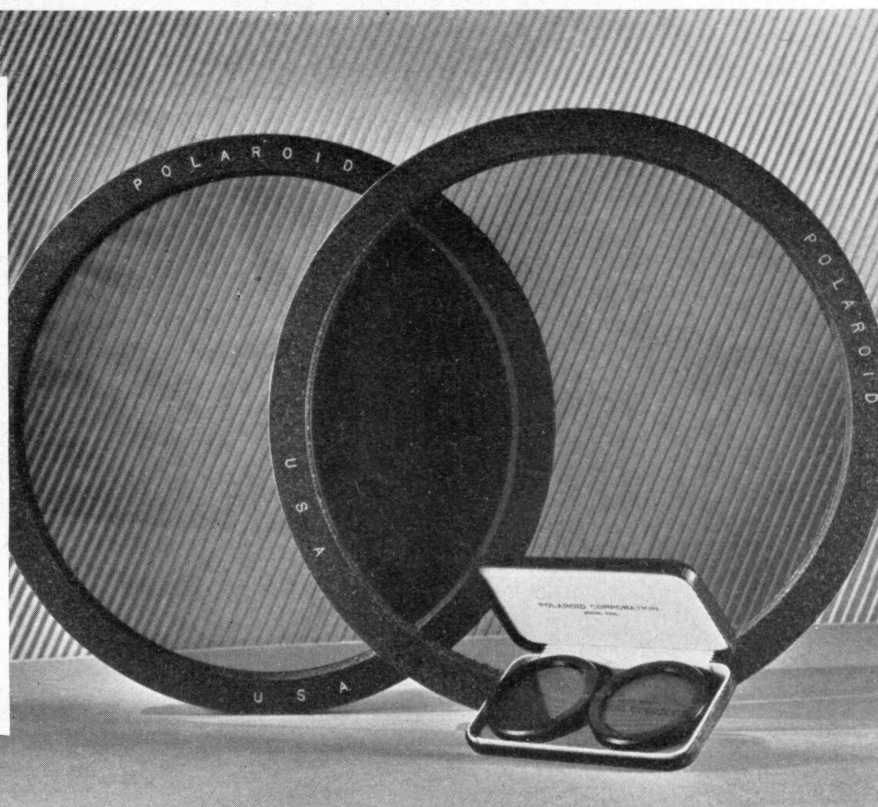
*A New Development  
of First Importance in All the Sciences*

# POLAROID

The New  
Light Polarizer

*Unlimited in Area*

*Low in Cost*



**P**OLARIZED light is now available for convenient use in unlimited areas — freed from all the limitations of the Nicol prism.

Polaroid is available in glass discs of any required area. It polarizes by simple transmission.

The smallest standard Polaroid disc has over five times the area of the largest Nicol prism regularly available — and costs only one-tenth as much. It offers an entirely new order of convenience and economy in the present applications of polarized light — and opens for development many fields which have remained relatively unexplored because of the inconvenience, limited apertures, and high cost of prismatic polarizers.

Polaroid offers unusual opportunities for the study and classroom demonstration of polarized light — for large scale study of strains in transparent material — testing of glassware — the study and even the lantern-slide projection of interference colors of crystals — light intensity control — chemical determinations — measurement of gloss — the study of superimposed independent color fields — non-glare surface study of paper, textiles, etc. — electro-optical shutters (Kerr cells) for velocity of light experiments, television, and facsimile work — studies in experimental psychology involving binocular vision and independent images —

*Polarizes visible light as effectively as the Nicol prism except for barely perceptible traces of inefficiency at the ends of the spectrum where the sensitivity of the eye is low. Structure is invisible at 1100 magnifications. Unaffected by age, ultra-violet light, temperatures to 250° F. Easily cleaned glass surfaces. Uniform polarization over entire area. Transparent to infra-red — no appreciable heating. Polarization over 99½% perfect. PRICES: 4 cm clear diam. in moulded rim, \$5.00; 25 cm clear diam. in metal rim, \$125.00 — other sizes in discs and large sheets are available on special order for immediate delivery.*

improved conversion of standard optical instruments to polarizing instruments — control of the glare of specular reflections of sky light.

**ENGINEERING SERVICE** — An expert technical staff including the Land-Wheelwright Laboratories will gladly cooperate with research workers whose problems involve the use of polarized light.

*Order Directly from*

## POLAROID CORP.

DIVISION 33

168 Dartmouth St. ■ Boston, Mass.

U. S. PATENTS: 1,918,848 — 1,989,371 — 1,951,664 — 1,956,867 — 2,011,553

# What is the best AIR HOSE for YOUR job?



**N**ATURALLY, that depends upon the job, for some are far more "hardboiled" than others. That is why Goodyear builds five different types of air hose to meet specific requirements of various services—a quality line that time has proved outstanding in withstanding the three chief enemies of hose life: *light, oil and pressure.*

Sunlight slowly oxidizes hose, causing it to crack like an old rubber band. To offset this, all Goodyear Hose has an exclusive, light-impervious, "anti-ox" compound cover that prevents premature checking.

To combat the rotting action of oil in the line Goodyear has developed a special non-porous, slow-aging, non-swelling tube stock that eliminates all danger of tube flaking off and clogging tools.

And all Goodyear Hose has a high-tensile carcass,

woven in a way that holds pulsing pressures with iron-pipe surety, yet gives extreme flexibility in short-radius work and absorbs dragging "tow rope" strains.

Specified by 

No wonder Goodyear Air Hose is recommended by all industry for its remarkable low-cost service. Why not consult that experienced hose expert the G.T.M.—Goodyear Technical Man. He'll gladly advise you which Goodyear Hose is best for your job. To bring him write Goodyear, Akron, Ohio, or Los Angeles, California—or the nearest Goodyear Mechanical Rubber Goods Distributor.

**BELTS • MOLDED GOODS  
HOSE • PACKING**  
Made by the makers of  
Goodyear Tires

THE GREATEST NAME  IN RUBBER  
**GOOD YEAR**



*Breaking through  
winter. From a  
photograph by  
George R. Slade*

# THE TECHNOLOGY REVIEW

*Title Reg. U. S. Pat. Office*

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 38, NO. 6

CONTENTS

MARCH, 1936

## THE COVER

*Transformers, from a photograph by Alexander Piaget*

FRONTISPIECE . . . . .	210
MOLECULAR PLANNING . . . . . BY GEORGE R. HARRISON	219
<i>The Superchemistry of the Future</i>	
NO ECONOMIST CAN BE INDIFFERENT . . . . . BY DAVIS R. DEWEY	221
<i>Where Shall Wisdom Be Found</i>	
NEW PATHWAYS IN SCIENCE . . . . . BY THE M.I.T. LIBRARY	223
<i>A Reading List of Books</i>	
SOLILOQUY IN A LABORATORY . . . . . BY FREDERICK G. FASSETT, JR.	224
<i>A Poem</i>	

THE TABULAR VIEW . . . . .	205
<i>Notes on Contributors and Contributions</i>	
THE TREND OF AFFAIRS . . . . .	211
<i>News of Science and Engineering</i>	
THE INSTITUTE GAZETTE . . . . .	225
<i>Relating to the Massachusetts Institute of Technology</i>	

*Editor*  
J. RHYNE KILLIAN, JR.

TENNEY L. DAVIS

*Publisher*  
HAROLD E. LOBDELL

*Editorial Associates*  
JOHN J. ROWLANDS

*Business Manager*  
RALPH T. JOPE

JOHN ELY BURCHARD

PUBLISHED MONTHLY FROM OCTOBER TO MAY INCLUSIVE AND IN JULY ON THE TWENTY-SEVENTH OF THE MONTH PRECEDING THE DATE OF ISSUE AT 50 CENTS A COPY. ANNUAL SUBSCRIPTION \$3.50; CANADIAN AND FOREIGN SUBSCRIPTION \$4.00. PUBLISHED FOR THE ALUMNI ASSOCIATION OF THE M. I. T. EDWARD L. MORELAND, PRESIDENT; MARSHALL B. DALTON, C. A. SAWYER, JR., VICE-PRESIDENTS; CHARLES E. LOCKE, SECRETARY; J. RHYNE KILLIAN, JR., TREASURER.

PUBLISHED AT THE RUMFORD PRESS, 10 FERRY STREET, CONCORD, N. H. EDITORIAL OFFICE, ROOM 11-203, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE A. MASS. ENTERED AS SECOND-CLASS MAIL MATTER AT THE POST OFFICE AT CONCORD, N. H. COPYRIGHT, 1936, BY THE ALUMNI ASSOCIATION OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY. THREE WEEKS MUST BE ALLOWED TO EFFECT CHANGES OF ADDRESS. BOTH OLD AND NEW ADDRESSES SHOULD BE GIVEN.



*Alexander Piaget*

*Somersaulting a Coal Car*

# THE TECHNOLOGY REVIEW

Vol. 38, No. 6



March, 1936

## The Trend of Affairs

### *Shoppers' Guide*

**I**F The Review Editors were assembling an exposition of new products and discoveries, important and unimportant, but novel, useful, or beguiling for their ingenuity, here are some of the items they might include at this time:

❑ The National Physical Laboratory of England reports the development of a new motor oil containing small quantities of tin and chromium in solution. The metals deposit on the surfaces of working parts and are said to reduce wear by 50% through their resistance to corrosion, one of the chief enemies of cylinder walls.

❑ One of the windows in the Vatican is made of a new type of glass in which "glass silk" is compressed between two sheets of ordinary glass. Developed by a British manufacturer, the new glass, which can be made in many colors, is said to diffuse light evenly. Another interesting window, in which thin Alabama Madre cream marble takes the place of glass, may be seen over the entrance to the Pennsylvania Station at Newark, N. J. The marble pane, which is half an inch thick, permits the passage of light, but reduces glare and heat.

❑ The rapid seasoning of certain species of wood by soaking or boiling them in a chemical solution is a recent achievement of the United States Forest Products Laboratory at Madison, Wis. Wood treated by this method does not require kiln-drying.

❑ From the Engineering Experiment Station of the University of Ohio comes announcement of a new building material described as "clay lumber," which is said to be fireproof, soundproof, strong, and cheap. The material is a baked clay product produced in strips four feet long and two feet wide. It may be tooled to shape, is an excellent insulator, and is expected to be useful where bricks are now employed.

❑ The use of phenol-formaldehyde resins as glue for veneers and plywood greatly extends the possibilities of these useful materials. The water-soluble glue hitherto employed as a bond has been a handicap which discouraged their use for many purposes for which they were otherwise ideal. While synthetic resin bonds are not new, their use for this purpose has only recently been accomplished successfully. The bond, known as Tego glue, is applied in the form of thin sheets. Veneers and plywood made by this method are already being used for furniture, radio cabinets, airplanes, and automobile bodies. The use of the new type of plywood for prefabricated houses is being considered.

❑ Creameries in South Africa are experimenting on the production of casein from buttermilk, a huge quantity of which is produced by its 700 plants manufacturing butter. The casein would be made into buttons and other such products salable in the domestic market.

❑ One of the latest uses for versatile rubber is in the form of drums for the shipment and storage of acids and other corrosive liquids, the handling of which has long been a problem. Many advantages are claimed for the new rubber containers: they are practically indestructible, lighter, and more easily handled than glass or stoneware, carboys, and flasks, and are long-lived. The new drums may be stored in the open, for they are not affected by rain or snow. Liquids stored in them are not subject to decomposition by light.

❑ Those who know the problem of removing paint, grease, and other substances from the skin will welcome a new vanishing cream which protects the skin from all ordinary stains. Pro-Tec, as the new cream is called, is rubbed into the skin, forming a film which leaves the hands dry and flexible without any sensation of stickiness. This protective covering may be easily washed away without leaving any trace of dirt or grime. It is

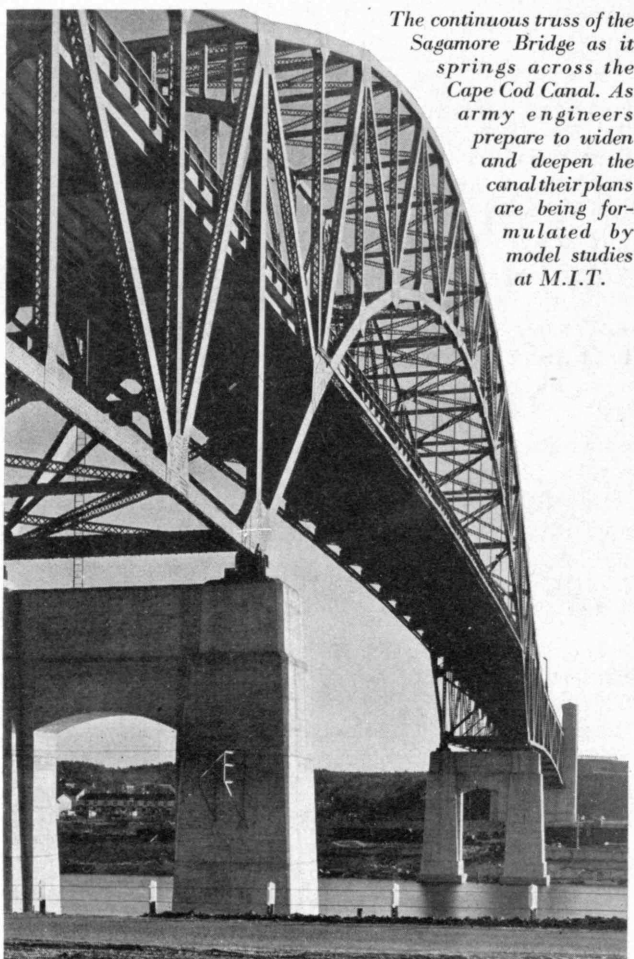
being used widely in industry and in the household, where it recommends itself especially to the man who tinkers on his car or works in the garden.

¶ A Cincinnati valveman has devised a method for detecting leaks in water mains and pipes by means of radio tubes coupled with a sensitive microphone pick-up. The device is connected with a hydrant or other valve that has a direct connection with the house or main line. The apparatus, it seems, has such an antipathy to leaks that it fairly sizzles as it is brought nearer and nearer the leak, finally roaring when in close range.

¶ There is a new nonskid bathtub with sloping sides and a wavy, embossed bottom. Inasmuch as more people are hurt in bathtubs than in airplane travel, this may prove a great boon, if skidding is actually prevented.

¶ Algeria offers a process for removing acid from olive oil so that it is not corrosive to metal. Thereupon the oil may be used in the crank case of a motor car or graphited for heavier lubrication purposes. The oil is best used in a mixture with a somewhat larger proportion of mineral oil.

¶ Germany announces an apparatus to fit on perambulators so that they can be rolled up and down stairs without jarring the young passenger. The apparatus is a type of roller which maintains the perambulator in a horizontal position and which will come to a standstill if for any reason the parent's grip on the pram should be released suddenly at mid stairs.



*The continuous truss of the Sagamore Bridge as it springs across the Cape Cod Canal. As army engineers prepare to widen and deepen the canal their plans are being formulated by model studies at M.I.T.*

Haskell



U. S. Bureau of Reclamation

*The All-American Canal is being cut through these sand hills along the western side of the Colorado River*

¶ For the harassed user of the public telephone, a Madison, Wis., manufacturer has contrived booths which remove at once the jumble of sound, bad air, and sweltering aromas. The booth works on the principle of absorbing extraneous sounds rather than attempting to cut them off. It is said to be effective enough in absorption so that no door is required to keep the speaker's voice from passing beyond the confines of the cellule.

¶ Electrical engineers are trying out a new pocket radio transmitter which is expected to be valuable for the adjective-adding process of reporting public events by radio, where and when they occur. The new transmitter, weighing less than a pound, transmits on waves approximately one meter in length. Its power is about two tenths of a watt, and its transmitting tower is just ten inches high. The unit proper consists of a three-inch cube of metal plates inside of which are located vacuum tubes about the size of acorns. Current is furnished by an external battery which may be carried on the back of the announcer. The tiny transmitter is designed as a pickup instrument for transmitting to the larger broadcasting studios where the program will be sent out through the regular broadcast channels. The midjet instrument has operated successfully over distances of four miles — experiments with a still smaller unit are in progress.

¶ Photographic prints in natural colors come a step nearer perfection in the Chromatone process, which is now offered to professional and amateur photographers as a comparatively simple method of making prints in natural color. Two young chemists, Francis H. Snyder and Henry W. Rimbach, worked out the process while searching for a better medium for making colored micrographs. The method is essentially a process of photographic color toning which is said to reproduce the colors of nature faithfully. It involves the production of three positive prints from either two- or three-color separation negatives. The prints are made on Chromatone print paper, which is a gelatine-collodion stripping film, and are then toned to the proper colors: magenta, blue-green, and yellow. The final step is superimposing these three prints in register on a white background.