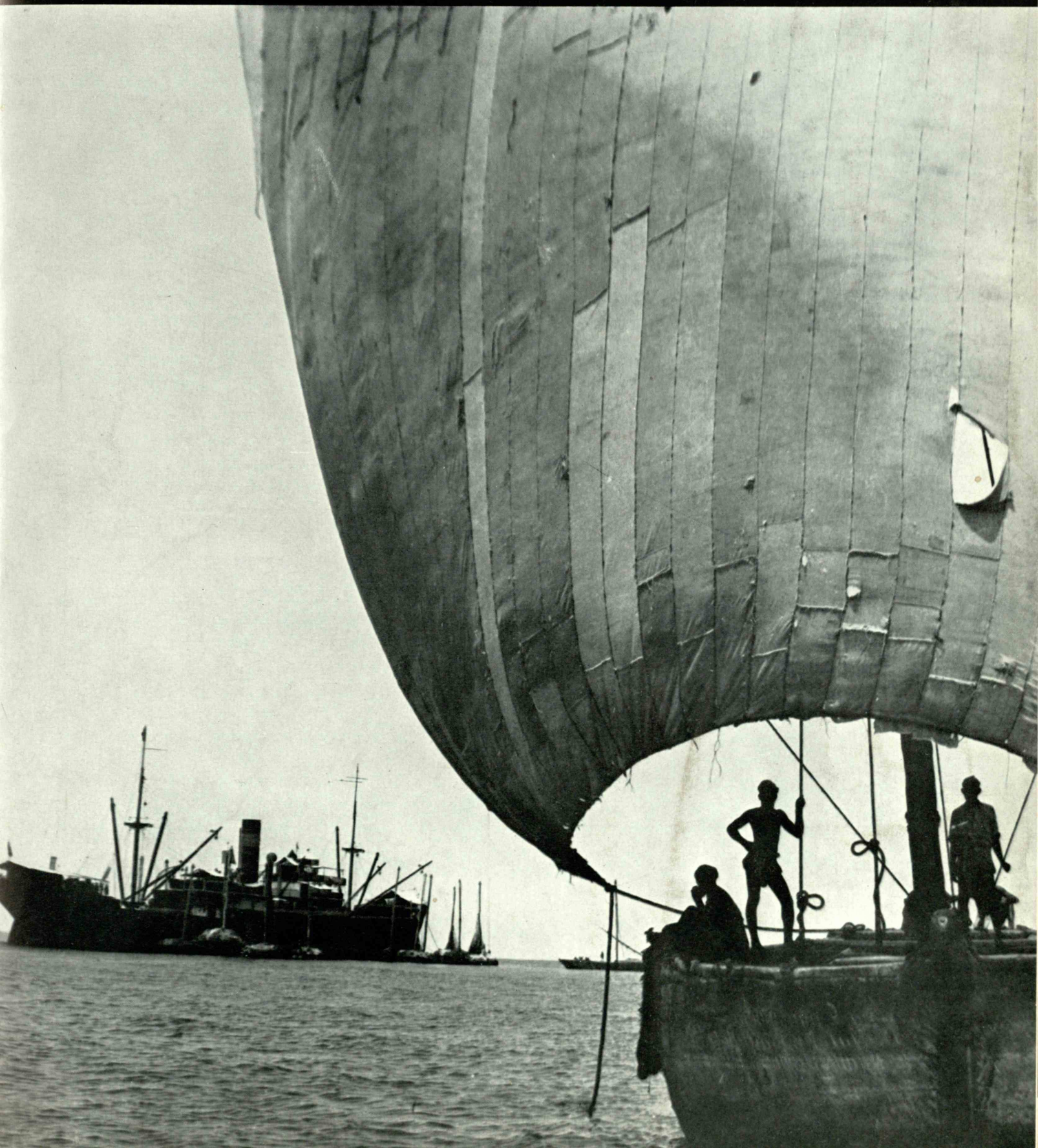


June 1940

TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office





GREETINGS

For NINETY-NINE YEARS the activities of the Badger organization have covered a wide range of processing projects that have taken their engineers to the four corners of the earth.

Badger engineers have been associated with the development of many processes of far reaching economical importance, the latest being the Houdry catalytic processes for the petroleum industry.

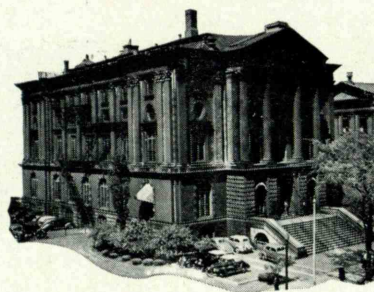
E. B. Badger & Sons Co. greets the returning graduates on M.I.T. Alumni Day, June 3, 1940.

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Specializing in Distillation, Evaporation
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The Roster OF TECH GRADUATES WITH E. B. BADGER & SONS CO.

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| R. D. Waterman | 1915 |
| W. H. Blank | 1916 |
| J. R. Minevitch | 1916 |
| B. R. Rosenberg | 1916 |
| H. W. Hatch | 1918 |
| W. T. Hall | 1919 |
| H. C. Moberg | 1919 |
| H. G. Bower | 1920 |
| H. S. McGee | 1922 |
| R. W. Spry | 1927 |
| A. J. Connell | 1928 |
| J. S. Carey | 1930 |
| J. J. Brown | 1933 |
| B. D. Lucey | 1933 |
| V. P. Cook | 1935 |
| W. C. Rousseau | 1935 |
| M. W. Shellenbarger | 1935 |
| R. E. Sawyer | 1936 |
| G. A. Randall | 1937 |
| Margaret Hutchinson Rousseau | 1937 |
| T. B. Oakes | 1938 |
| J. M. Chambers | 1939 |
| J. C. Starr | 1940 |



DU PONT
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RESEARCH

Here's What It Means To Industry

SINCE its very beginning the du Pont Company has emphasized the importance of extensive, scientific research, both fundamental and applied. It has backed up its faith in research by maintaining large laboratories. In these laboratories groups of scientists are constantly working, in good times and bad, developing new lines of products, improving products in the old lines, checking up and modernizing old processes and providing new ones.

Every branch of industry, and the ultimate consumer, too, benefits by this extensive research. The objective is chemicals and materials which are cheaper, better, more easily worked to help manufacturers to reduce their costs, and improve their products. Better materials at lower costs enable manufacturers to develop and expand consumer markets, to make available

to more people more of the better things for better living.

Du Pont research is carried on for industry in general. New products and new uses can't be picked out of the air. New industries don't "just happen." They are the result of planned research, planned development far in advance, a careful groundwork of today to create the things which may be required to meet the needs and conditions of one, five, ten and even twenty years later.

The answer to what du Pont research means to industry rests with hundreds of improved products and processes which are now in use in a wide variety of industries, by the support which industry has given du Pont, thereby enabling it, not only to carry on, but to broaden its research activities.

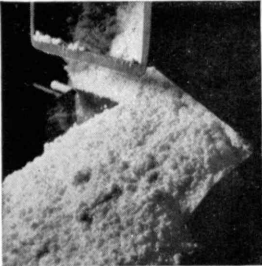


E. I. DUPONT DE NEMOURS & COMPANY
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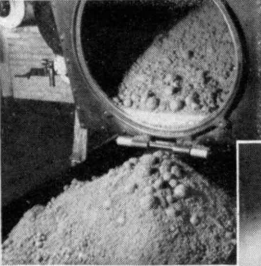
BETTER THINGS *for* BETTER LIVING . . . THROUGH CHEMISTRY

RAYON... *from start to finish*

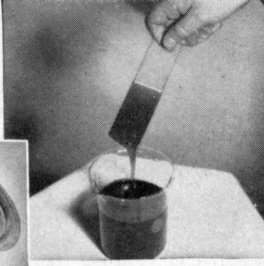
Cellulose plus caustic soda




Plus carbon disulphide




Dissolved becomes viscose



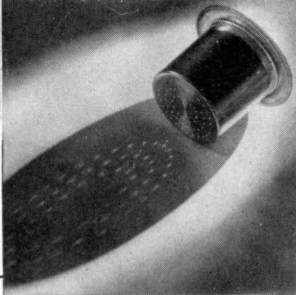
Yarn from spinning machine



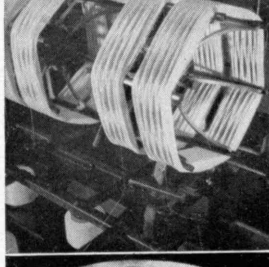
Pure cellulose

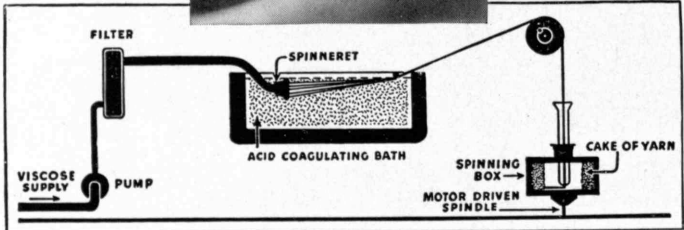


Spinneret



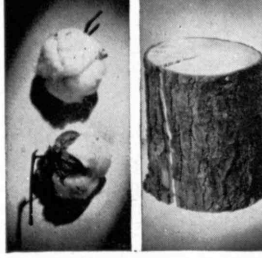
Skeins reeled prior to washing and bleaching



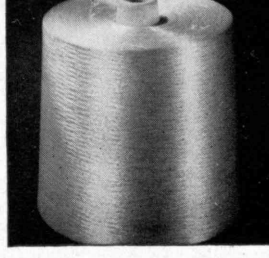


Spinning Operation

Cotton and Spruce



Ready for weaving or knitting



Viscose Rayon undergoes the following steps, from pulp to finished fibre:

1. Cellulose from specially treated wood pulp or cotton goes into a mill in "sheets" or baled loose pulp. These are...
2. Steeped in a mercerizing solution, broken up and...
3. "Crumbled." Then the "crumb" is aged in open pans and...
4. Treated chemically, to make it soluble. It then becomes a liquid, called viscose, and it is ready for the...

5. Spinneret. It is forced through minute perforations, forming fine filaments or threads, which harden in a coagulating bath; and many filaments are twisted into yarn by a revolving spindle.

Constantly tested for uniformity, at every stage, rayon yarn is shipped to fabric mills either in skeins or on cones or spools, ready to be placed directly on spindles or looms.

A man-made fibre, rayon has qualities which commend it—beauty, durability and adaptability to hundreds of textile uses.

For further information write:

AMERICAN VISCOSE CORPORATION

350 Fifth Avenue, New York City • *The World's Largest Producer of Rayon Yarn*

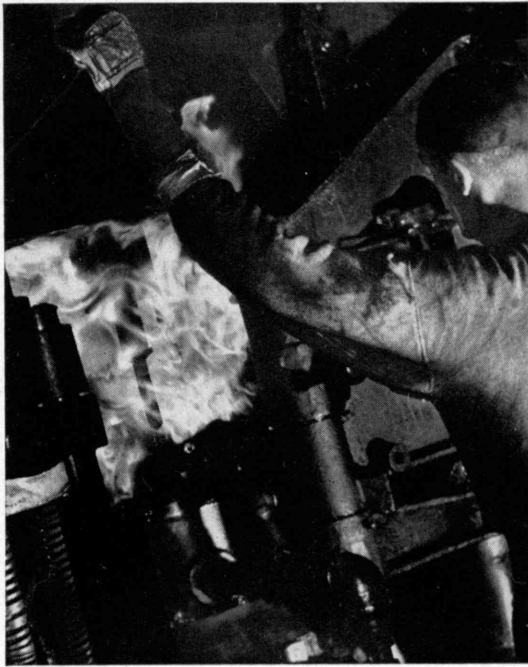
Copr. 1940, American Viscose Corp.



PLANTS

| | |
|------------------|--------|
| Marcus Hook..... | Pa. |
| Lewistown..... | Pa. |
| Meadville..... | Pa. |
| Roanoke..... | Va. |
| Front Royal..... | Va. |
| Parkersburg..... | W. Va. |
| Nitro..... | W. Va. |

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CONDENSER TUBES . . .

IF YOU could only "wish" heat-exchanger tubes into your jobs just the way you want them — proper specifications conscientiously adhered to; best modern equipment for manufacturing; constant production control of physical properties; 100% inspection by men who are experts — if this were only possible, you would probably say to yourself, "There is the company for my tube business!" Let us hear from you.



CASTING PRACTISE AT WOLVERINE IS THE RESULT OF MANY YEARS OF EXPERIMENT AND PRODUCES THESE BILLETS FOR THE EXPRESS PURPOSE OF EXTRUDING NON-FERROUS TUBES

WOLVERINE TUBE COMPANY

**DETROIT
MICHIGAN**

Seamless Copper and Brass Tubing

GEORGE R. ANTHONY '98, Vice-President

REUNION PROGRAM

May 31, June 1-4

Class Reunions: For scheduled reunions and meetings of classes during the reunion period, see page 332. Ask your Class Secretary for complete details.

JUNE 2

6:30 P.M. President Compton's supper for Honorary Secretaries, officers of Technology clubs, and Alumni Fund class agents. Engineers Club, 2 Commonwealth Avenue, Boston. Informal dress.

JUNE 3

ALUMNI DAY AT TECHNOLOGY

Morning

8:30 A.M.-10:00 A.M. Registration for Alumni and their wives in the Rogers Lobby. Tickets previously ordered may be obtained at the registration desk. There will be a registration charge of \$1.50 for those not purchasing blanket tickets. Payment of this registration charge will permit Alumni to attend the Communications Conference and the Luncheon. *Tickets for these events cannot be purchased in advance of June 3 except by the purchase of a \$5.00 blanket ticket.*

10:00 A.M. Communications Conference, "Channels of World News and Opinion," Huntington Hall (Room 10-250). Admission by ticket only until 9:55 A.M.

Speakers

DR. FRANK B. JEWETT '03, *Presiding Officer*
President, Alumni Association
President, Bell Telephone Laboratories
Vice-President, American Telephone and Telegraph Co.

ALFRED H. MORTON, *Vice-President in Charge of Television, National Broadcasting Company; European Manager, Radio Corporation of America 1929-1934; Manager Program Department, National Broadcasting Company 1934-1937; Vice-President in Charge of N.B.C. Managed and Operated Stations 1937-1939*

"THE ROLE OF RADIO IN WORLD AFFAIRS"

JAMES H. FURAY, *Vice-President, United Press Associations; Member of the Association of Foreign Press Correspondents; Staff of the United Press Associations since 1908; Foreign Editor 1918-1924; General Foreign Manager 1924-1937*

"BEHIND SCENES IN THE WORLD OF NEWS GATHERING"

Exhibit

This program, together with extensive exhibits in both the Main and Rogers Lobbies, showing scientific progress in the transmission of information by wire and radio, offers Alumni an unexcelled opportunity to inform themselves about the rapid development in the field of communications. Included among the exhibits will be a teletype receiving up-to-the-minute press association dispatches, teletype-setter for setting type by wire, picture transmitter, ship-to-shore radio transmitter and receiver with radio compass, aviation radio receiver and transmitter with altimeter, and others.

Alumni Day 1940 will long be remembered by Tech men for these interesting exhibits, and bids fair to become one of the most fascinating and stimulating alumni conferences ever held.

Afternoon

12:30 P.M. Luncheon for all Alumni and their guests in Du Pont Court. Tickets required. Special tables for the 50th (1890) and the 25th (1915) reunion classes, and for their women guests.

2:00 P.M. Class Day Exercises in Lowell Court, featuring the Senior Class, and the Classes of 1890 and 1915.

Prominent speakers, including representatives of the Alumni Association, 50th year, 25th year, and Senior classes. During the Class Day ceremonies, the present Senior Class of 1940 is officially initiated to membership in the Alumni Association.

4:15 P.M. Dedication ceremonies of Technology's swimming pool, made possible by alumni, staff, and student endeavor. After the dedication, the pool building will be open for inspection by Alumni and their guests.

Evening

6:30 P.M. Banquet in honor of the Tenth Anniversary of Dr. Compton's inauguration. No speeches except a brief highlighting by Dr. Frank B. Jewett of the accomplishments at Technology since Dr. Compton became its President, and Dr. Compton's interesting annual report on the status of the Institute.

A treat of the evening will be a demonstration in sound (not a moving picture), known as the "Vocoder." Its inventor, Dr. Homer Dudley, will be present to entertain, to amuse, and withal to excite the interest of the technically minded.

When a Hollywood director recently heard the "Vocoder" transform a pipe-organ rendition of "The Bells of St. Mary" into the words of this song, he described the effect as an ethereal choir. This mechanical Pygmalion of sound, the "Vocoder," could transform a Voice to a degree *cum laude*; it could even make the voice of Charlie Locke sound like Lily Pons!

Of course, there will be another attractive stein to add to your collection — obtainable only at the dinner.

Admission to seats at the banquet table will be restricted to former students, their male guests, and members of the Corporation and Staff who hold the \$5.00 blanket tickets. No separate tickets for the dinner will be available. Seating will be by classes, and seats will be reserved by number. We cannot guarantee to seat you with your class unless your ticket application is received on or before June 1. Informal dress.

Tables will be provided for nonalumni members of the Corporation and Institute Staff.

Program for the Ladies — June 3

An interesting and entertaining program has been arranged for Alumnae and wives of Technology Alumni. The program:

8:30-10:00 A.M. Registration in lobby of Rogers Building.

9:00-10:00 A.M. Coffee served in Emma Rogers Room (10-340).

10:00 A.M. Conference, "Channels of World News and Opinion."

12:30 P.M. Luncheon in Du Pont Court.

2:00 P.M. Class Day Exercises.

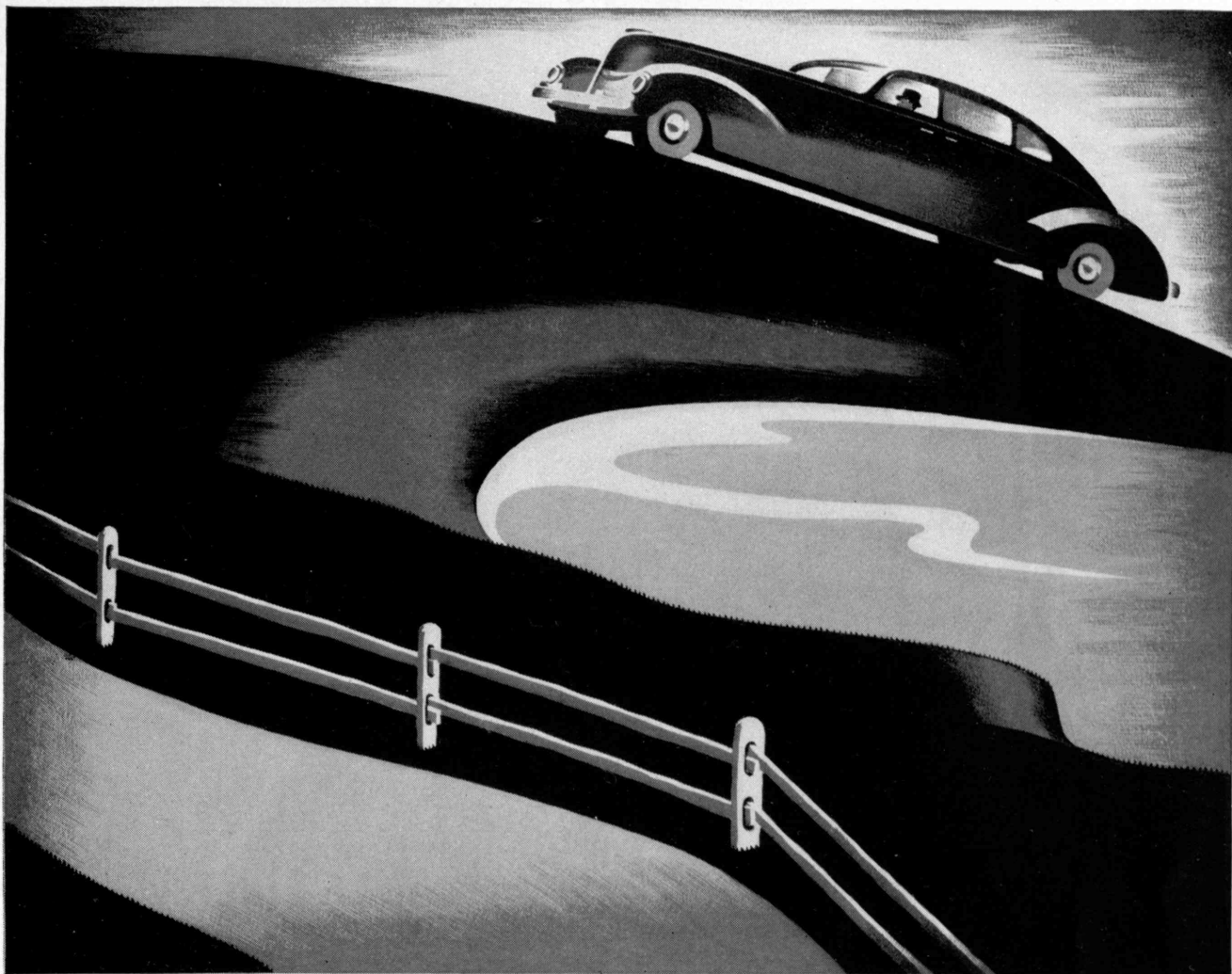
3:45-4:45 P.M. Open House in the Forris Jewett Moore Room (6-321), Eastman Building.

5:00 P.M. Motorboat Trip on Charles River Basin leaving from, and returning to, M.I.T. Sailing Pavilion in front of Walker Memorial.

6:30 P.M. Dinner at the home of Mrs. Karl T. Compton, 111 Charles River Road, Cambridge.

8:00 P.M. Busses leave the President's House for the Hotel Statler in time for program following men's dinner.

Tickets for ladies, covering Registration, Conference, Luncheon, Boat Trip, Ladies' Dinner at President's House, and the program following the men's dinner at the Statler, may be ordered with the men's blanket tickets at the nominal charge of \$3.00. Separate luncheon tickets may be purchased on June 3 at \$1.50; Ladies' Dinner tickets at \$2.00.



REQUIREMENTS MET AND MONEY SAVED

Cast iron distributor gears for automotive engines have several recognized advantages. They are quiet, wear well, and are comparatively inexpensive. The problem is to produce a cast iron with the necessary wearing qualities and yet keep it machineable.

Several automotive engine manufacturers are now obtaining the necessary strength (50,000 p.s.i.) and hardness (250-300 B.H.N.) — and eliminating machining difficulties—by making distributor gears of Nickel-Chromium-Molybdenum iron. The machineability of

the iron is largely a result of its Molybdenum content.

By specifying this machineable iron, engine builders can meet distributor gear requirements with regard to noise and wearing quality — and save money doing it.

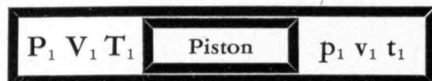
Full technical details concerning Nickel-Chromium-Molybdenum iron and other cast irons serving the automotive field with efficiency and economy are found in our book "Molybdenum in Cast Iron." Sent free on request to any interested technical student.

PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

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Just for Fun! A CHALLENGE TO YOUR INGENUITY

THE ends of a closed cylinder, fitted with a leakproof, frictionless piston, are filled with perfect gases having the initial pressures, volumes, and temperatures indicated. If all of the walls are perfect heat insulators, where will the piston finally stop?



A says: Where $P=p$, using adiabatic processes.
B says: The piston will oscillate perpetually.
C says: Even though heat does not flow *through* the piston, the piston itself will act like a big molecule, and [after many oscillations] the pressures *and* temperatures will equalize.
Who is right? Are there other possibilities?

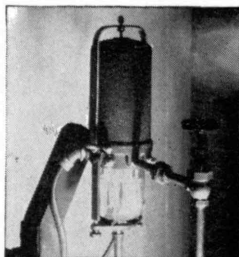
We specialize in industrial physics and offer a
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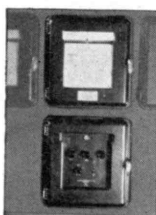
a continuous record of

pH values
with a

GLASS ELECTRODE



The Cambridge pH Recorder offers many advantages. It operates from either 25 or 60 cycle lines, thus eliminates nuisance and limitations of batteries. The vapor-tight cases permit use under adverse conditions. Sampling point may be as much as several hundred feet from the recorder to which it is connected with only an electric cable. These and many other features make the Cambridge pH Recorder the ideal instrument for Power Stations, Oil Refineries, Water and Sewage Treating Plants, Textile Mills, Sugar Refineries, Paper Mills and other process industries.



Typical installation

Send for List No. 910 T

CAMBRIDGE
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pH RECORDER



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THE TABULAR VIEW

AS physicist and as president of the Institute, KARL T. COMPTON has a clear comprehension of science corresponding well with the sincere appreciation of religion which he possesses as an honest and reflective thinker. Hence discussion by him of these two concepts and their interrelations (page 319) is of particular interest and penetration. ¶ A. H. PHILLIPS, whose account of some of the ciphers utilized for the transmission of secret intelligence in wartime (page 321) is somberly appropriate to the present, was a divisional intelligence officer in the British army during the war of 1914-1918. He has spent many years in the United States as a newspaperman and as a scenario writer in Hollywood. His wartime activities gave him much insight into the ways and means of secret agents. ¶ Surgeon general of the United States Public Health Service since April, 1936, THOMAS PARRAN, JR., has done a great deal to bring sharply into the public consciousness both the service and the objectives which it seeks. In this issue, The Review presents an article (page 323) in which Dr. Parran discusses deficiencies in the national diet, their consequences in the national health, and the effects on industry and agriculture which are to be expected if effort to supply the lacks is successful. Dr. Parran's article is drawn from the William Thompson Sedgwick Memorial Lecture which he delivered at Technology in April of this year. ¶ As the summer opens and the camera enthusiast senses the gradual approach of vacation days, he may be thinking of emulating those photographers whose portrayals of birds and beasts have in the past stirred his envy. One of the ablest of these gentlemen is HENRY B. KANE, '24, first Director of the newly established Alumni Fund, author, illustrator, and portrayer of wild life whose photographs have been widely applauded throughout the country. In this month's Review (page 326) Mr. Kane tells all, or nearly all, of the tribulations and the delights of this kind of photography and, in addition, he tells many of the specific devices and means which he has found to be successful in its practice. The amateur who wishes to go and do likewise will here find shrewd advice. ¶ CLARK S. ROBINSON, '09, Associate Professor of Chemical Engineering at Technology, was presented to The Review audience in February, when he discussed, in the light of his experience as chief of the ammunition division of the Boston District Ordnance Office, American needs for wartime materials. A distinctly different subject engages him in this issue (page 329). His essay upon the factual history of metals which underlies North European mythology commands interest on its own merits and is, in addition, a side light on lands unhappily prominent in war headlines.

TO the Cover Club, The Review welcomes PAUL M. WISWALL, '09, with a striking photograph of a native lighter on the Malabar Coast of India. Lashings rather than treenails secure the hulls of these vessels, whose multipatched sails are colorful and curved.



"SORRY, JONES, YOUR RUSH ORDER CAN'T BE FILLED"

*Business disasters like this
can be prevented*

**WE BUILD FIRES SO YOU MAY
KNOW HOW TO PUT THEM OUT**

**BOSTON MANUFACTURERS
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Marshall B. Dalton, '15, President

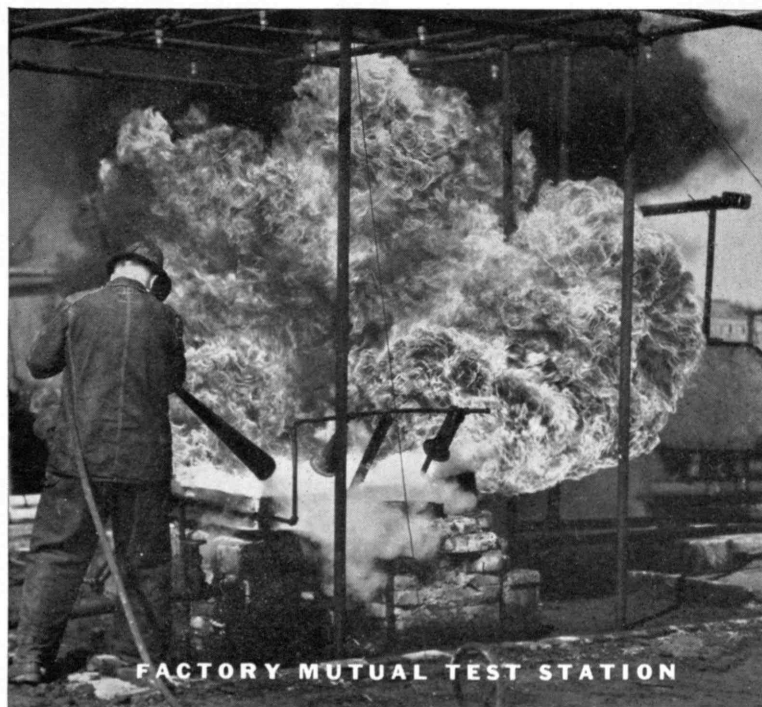
**WORCESTER MANUFACTURERS
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Gilbert M. Roddy, '31
William W. Garth, '36



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MAIL RETURNS

LETTERS AND PICTURES FROM REVIEW READERS

Subdeb

FROM L. MAGRUDER PASSANO:

Airy fairy, Neu-tri-no,
Weighing nothing when you're slow,
Gaining weight when moving fast,
Tell us what you'll be at last.
When you move with speed of light
Will you be a "moving" sight
Like Lillian Russell or Mae West,
Broad of hip and full of breast?
Or like the circus lady fat
Whom as kids we wondered at,
Needing a whole couch to sit on,
With a shape no gown would fit on?
All our girls, though fast enough,
Still preserve that glamour stuff,
And however fast their gait
Never, never put on weight.
Don't, dear, get Gay Ninety's figger.
Have a heart and don't grow bigger.
Put the brake on. Red lights show.
Airy fairy, Neu-tri-no!

Brookline, Mass.

How to Do It?

FROM THOMAS L. HINCKLEY, '06:

Few students of our government will quarrel with the three specifics for our governmental ills outlined by Stuart A. Rice in the April

Review. I wish, however, that Dr. Rice had carried his analysis one step farther and shown how these three objectives are to be reached. Beginnings along the lines indicated have, of course, been made in our manager-governed cities, in a number of counties, and in some states; the chief need would seem to be to determine how to accelerate this trend. The problem of how to speed up the process and at the same time be sure that we are not substituting new evils for those which already exist is of prime importance.

How, for instance, are our national political parties to be persuaded to yield control over the thousands of positions which form the very lifeblood of their respective organizations? How are the holders of such positions to become reconciled to giving up their means of livelihood in times like the present when the only alternative to a public job is apt to be a place on the public welfare pay roll? Who is to decide at each level of government which positions are necessary to the performance of essential public services and which are not — which units can be dispensed with and which cannot? And how can we be sure that in streamlining government we are not providing an ideal setup for some future demagogue . . . ?

Republican France owes her highly centralized and efficient governmental system mainly to the dictatorship of Napoleon; will it be necessary for us to pass through a similar experience in order to achieve what are conceded to be desirable ends — desirable at least from the standpoints of organization and administration? Is it not necessary to draw a sharp line of demarcation between the legislative aspects of government — where, in order to avoid the inclusion of sizable minorities, a large number of separate units are to be desired — and the executive functions, where streamlining is advisable? Again, bearing in mind that with each telescoping of adminis- (Concluded on page 309)

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