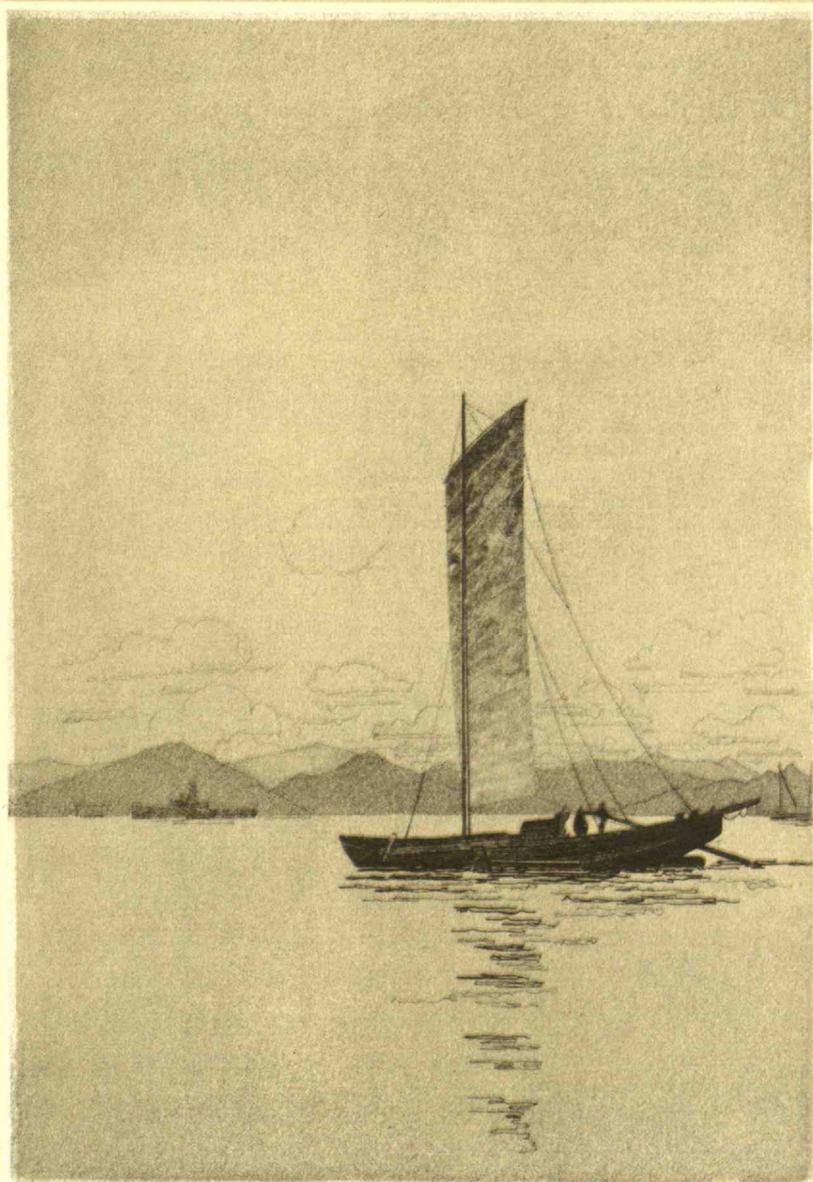
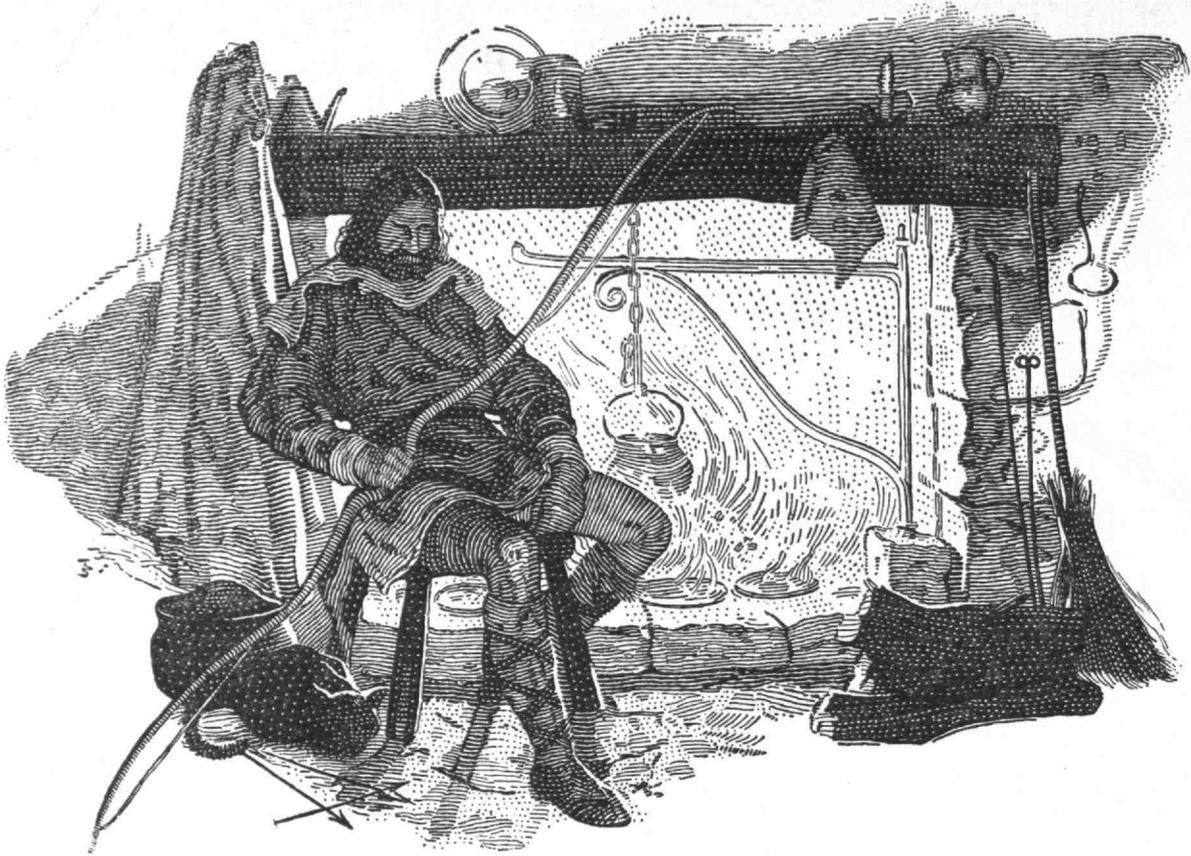


The April
TECHNOLOGY
REVIEW



John Taylor Army 1919

RELATING TO THE MASSACHUSETTS
INSTITUTE OF TECHNOLOGY



When a King forgot

KING ALFRED the Great, compelled to flee from his enemies, took refuge in the hut of a peasant. There he was set to watch the cakes as they baked on the hot stones; but lost in dreams of restoring his shattered kingdom, he allowed the cakes to burn; and was roundly scolded for his carelessness.



Not only huge bake ovens, but furnaces for heat-treating steel, melting pots, and dryers are among the many applications of electric heat. Unless you have been in touch with developments during the last year, there is probably some job in your plant that electric heat can do *better*. Let the General Electric Company's specialists help you—as they have helped hundreds of others—to substantial economies and improved production through the application of electric heat.

Crude implements for baking—those hot stones; and even when ovens came into use, almost equal care was necessary. Success depended on close watching of temperature and time.

But now, in this age of precise methods, electric heat—dependable and automatically controlled—has made baking an exact science. The largest modern bakeries are installing electrically heated ovens, and housewives are finding electric ranges a boon to their daily work. In *every* industrial plant and in every home, there are opportunities to use electric heat, with a financial saving and to the betterment of the product.

GENERAL ELECTRIC



STEAMSHIP TICKETS

BY ALL LINES

AT THE COMPANIES' PUBLISHED RATES

RAYMOND-WHITCOMB are agents for all the leading steamship lines. At their office you can compare sailing lists, steamship diagrams and rates of the different companies; obtain expert information regarding ships and routes; purchase tickets at the steamship companies' regular rates and obtain welcome help with passports and visas. Whether you are traveling for business or pleasure you can save much time and much effort by buying your steamship tickets from Raymond-Whitcomb.

WEST INDIES CRUISE

March 31 to April 17, on the S. S. "*Samaria*"

MEDITERRANEAN SPRING CRUISE

Sailing April 7, on the Cunard liner "*Carinthia*"

NORTH CAPE CRUISE

The annual Raymond-Whitcomb Summer Cruise — more complete than ever before. Sailing June 27, on the S. S. "*Carinthia*"

EUROPE TOURS

Spring and Summer Tours — \$795 and upward

LAND CRUISES IN AMERICA

Round trips of three to nine weeks on special trains

Round Africa Cruise, January 12, 1929

RAYMOND & WHITCOMB COMPANY

165 TREMONT STREET, BOSTON, MASSACHUSETTS

Other Offices in

NEW YORK PHILADELPHIA CHICAGO LOS ANGELES SAN FRANCISCO

DIVISION OF INDUSTRIAL COÖPERATION & RESEARCH

THROUGH this Division the equipment of the Institute laboratories and the experience of its staff members are made available to a limited extent for the study of industrial research problems. The original "Technology Plan" of regular coöperation with such companies as had executed a yearly contract is conducted as heretofore. In addition the Division now offers a second method for the study of occasional problems to industries which do not require a continuous service. Details of this method will be supplied upon request to those interested.

All inquiries should be addressed to the
DIVISION OF INDUSTRIAL
COÖPERATION & RESEARCH
MASSACHUSETTS INSTITUTE of TECHNOLOGY
CAMBRIDGE

The Tabular View

HOW far that little candle throws his beams!" A traveler recently returned from Europe reports having discovered a copy of *The Review* debonairly holding forth among many foreign magazines on the reading table of a hotel on the *Côte d'Azur*. Although not connected in any way with the Institute, this traveler on the Riviera found the issue a comforting friend among strangers, and encountered in its pages news of many acquaintances. ¶ Few people realize how wide spread is the distribution of *The Review*, just as few are aware that its circulation is nearly 8,000. Outside of Canada, Mexico, and the American Possessions, it is mailed to more than thirty foreign countries. Curiously, Japan leads with the greatest number of subscriptions (15). Next, in order, come the British Isles with 14, Chile with 9, France and Argentina 8 each, China and Spain 7 each, Colombia 6, Germany, India and Peru 5 each, Norway and Siam 4 each. The remainder of the total list of 135 goes to the British West Indies, Belgium, Italy, Persia, Poland, Russia, Austria, Switzerland, Liberia, Ceylon, Singapore, Guatemala, Abyssinia, South Africa, Costa Rica, Bolivia, Brazil, Uruguay, Venezuela, and Australia. ¶ The list is imposing, but the insatiable Editors are now concocting schemes for placing a few subscriptions in Egypt, Mongolia, Iceland, Jugoslavia, and the remaining countries of the world. Perhaps Commander Byrd may be induced to solicit students for the Institute within the Antarctic circle.

CONTRIBUTORS to this issue of *The Review* include a librarian, a statistician, a mining engineer, and an architect. ¶ KATHARINE MAYNARD is in charge of the Vail Library, Technology's notable collection donated by the late head of the American Telephone and Telegraph Company, and life member of the Corporation. ¶ EDWIN B. WILSON, author of the article on statistics, page 347, was from 1917 to 1922 Head of the Institute's Department of Physics, and from 1920 to 1922 a member of the Administrative Committee. At present he is professor of Vital Statistics in the Harvard School of Public Health. ¶ G. H. CLEVENGER, who prepared the report of the Advisory Committee on Mining and Metallurgy is Consulting Engineer for the United States Smelting, Refining and Mining Company. ¶ WILLIAM EMERSON, who reviews THOMAS E. TALMADGE'S "Story of American Architecture" on page 356, has been Head of the Institute's Department of Architecture since 1919. He is also a Vice-President of the A. I. A.

ANTICIPATING the dedication of the Guggenheim Aëronautical Laboratory early in June, *The Review* expects to devote considerable space in the May issue to the part the Institute has played in the progress of aviation. If plans do not go astray there will be an important article by an authority eminent in the field of aëronautics. ¶ The Review Staff, for an early issue, is preparing an account of how Technology men have furthered municipal and governmental improvements in America. The facts are so numerous and extensive that they bear eloquent testimony to the part taken by technically trained men in social progress.

The TECHNOLOGY REVIEW

Relating to the Massachusetts Institute of Technology

VOLUME 30



NUMBER 6

Contents for April, 1928

The Tabular View	330
The Trend of Affairs	333
Description des Expériences de la Machine Aérostatique	341
<i>By Katharine Maynard</i>	
The Use and Abuse of Statistics	347
<i>By Edwin B. Wilson</i>	
Advisory Committee Report: Department of Mining and Metallurgy	350
Undergraduate Affairs	353
Books	356
Log Cabins to Skyscrapers by <i>William Emerson</i> ; Seven Men by <i>J. R. K., Jr.</i> ; Ovis Poli by <i>H. E. L.</i> ; and Brief Reviews by <i>The Review Staff</i> .	
News from the Classes	358
News from the Alumni Clubs	378
Cover Etching, "A Hongkong Canal Boat" by John Taylor Arms, '11. <i>Courtesy, Charles E. Goodspeed & Company.</i>	

H. E. LOBDELL, '17 *Editor*
J. R. KILLIAN, JR., '26 *Managing Editor*
J. D. CRAWFORD, '27 *Assistant Managing Editor*
R. E. ROGERS } *Contributing Editors*
J. J. ROWLANDS }

Published monthly 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 Massachusetts Institute of Technology; Samuel C. Prescott, '94, *President*; George E. Merryweather, '96, Henry F. Bryant, '87, Elisha Lee, '92, *Vice-Presidents*; Orville B. Denison, '11, *Secretary-Treasurer*. Editorial Office, Room 3-205, Massachusetts Institute of Technology, Cambridge, Mass. Published at the Rumford Press, 10 Ferry Street, Concord, N. H. Entered as Second Class Mail Matter at the Post Office at Concord, N. H. Copyright, 1928, by The Technology Review. Three weeks must be allowed to effect changes of address. Both old and new addresses should be given.

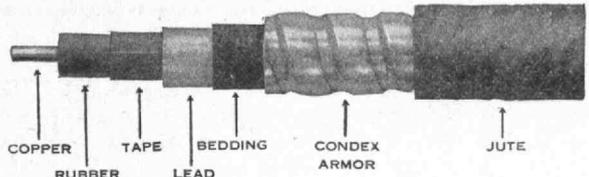
Where Will He Prepare for College?

☞ WHETHER your boy goes to Technology or to some other college with high standards, you must decide where he shall prepare himself. Realizing that this problem confronts many of its readers, The Review is enlisting the coöperation of the leading preparatory schools of the country, and on page 389 of this issue appears a list of reliable accredited schools which prepare boys for college.

☞ SHOULD you be interested in any one or all of these schools, a letter to us or to the individual schools will bring you detailed information.

☞ "SCHOOLS," we anticipate, will be an increasingly valuable feature of The Review.

CONDEX Park Cable



**A practical cable to use for
underground service.**

CONDEX Park Cable is the most practical cable to use for some types of underground service. It is ideal on series lighting circuits for municipal street lighting, "white way" installations, and for park or playground illuminating systems.

Speed with CONDEX

The speed with which CONDEX can be laid is an important factor in its choice for this kind of work.

Economy with CONDEX

The low cost of installing CONDEX will greatly surprise any distribution engineer who is not familiar with this cable. No conduits are necessary, very little digging is required and unskilled labor may be used.

Permanency with CONDEX

It is the service underground which indicates the true value of a parkway cable. Once placed underground CONDEX is good for years.

For service, economy and better public relations, it will pay to install CONDEX. This type of cable with arched, interlocked steel armor was originated by us and during the past few years has met with the approval of public utility engineers throughout the country.

SIMPLEX WIRE & CABLE CO

MANUFACTURERS

201 DEVONSHIRE ST., BOSTON

BRANCH SALES OFFICES

NEW YORK, 1328 Broadway SAN FRANCISCO, 390 Fourth St.
CHICAGO, 15 S. Desplaines St. CLEVELAND, 2019 Union Trust Bldg.
JACKSONVILLE, 1010 Barnett Nat'l Bank Bldg.

9 CLIENTS
73 CONTRACTS
VALUE \$180,000,000

Work now in progress brings our total for the following clients to \$180,000,000.

American Sugar Refining Company
Central Indiana Power Company
The Edison Electric Illum'g Co. of Boston
Ford Motor Company
The Hartford Electric Light Company
The Philadelphia Electric Company
Potomac Electric Power Company
Southern California Edison Company
The Western Union Telegraph Company

There are 73 contracts, an average of 8 contracts per client. The list shows the national extent of our service. Some of the work is abroad. Contracts include new power stations both steam and hydroelectric, extension and modernizing of old power stations, the construction of manufacturing plants, service buildings, office buildings, docks and a variety of other work.

STONE & WEBSTER

INCORPORATED



BOSTON, 49 Federal Street
NEW YORK, 120 Broadway
CHICAGO, First National Bank Bldg.

PITTSBURGH, Union Trust Bldg.
SAN FRANCISCO, Holbrook Bldg.
PHILADELPHIA, Real Estate Trust Bldg.

The TECHNOLOGY REVIEW

VOLUME 30

APRIL, 1928

NUMBER 6

The Trend of Affairs

THE crocus is generally accepted as the first harbinger of Spring, but those in the Institute who know do not cast their eyes upon the greensward, nor do they lift them to the heavens for a glimpse of geese flying northward. Instead, they watch Professor Robert H. Smith, who presides in the Machine Tool Laboratory, and the arrival of spring is unofficially accepted as that day when Professor Smith first speaks of Open House Night.

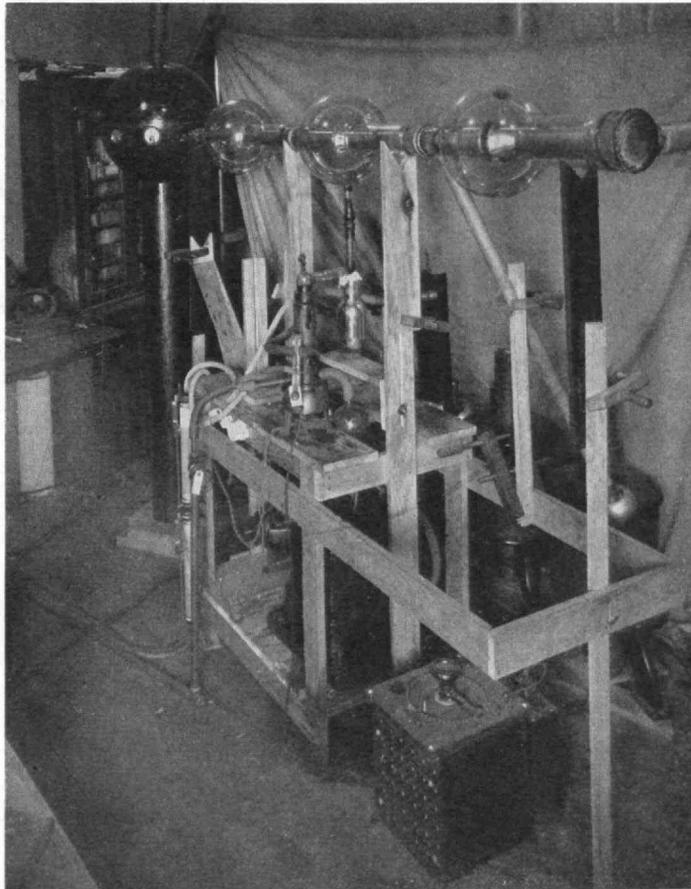
It all begins with a feverish activity in the Machine Tool Laboratory. As the sun warms, the fever grows. Suddenly, talk of Open House Night breaks out. It is infectious, if not contagious, and presently the crisis and Professor Smith arrive simultaneously at a committee meeting of the Combined Professional Societies under the auspices of which Open House Night is conducted. The date is set!

This year Open House Night is to be on April 28, and now that the date has been fixed, plans are in the making. 'Tis whispered that the bouncing ball bearings which jump through rings and do other breath-taking stunts in the Machine Tool Laboratory, already are rehearsing vigorously. "Bigger and Better" is the cry, and a number of sub-committees are now hard at work arranging for exhibits from all Departments. The best astrological information is that the signs are auspicious. This year should set new standards for Open House Night. The passing of a year brings

many changes and there will be much that is new to show the throng which comes annually to see what has been accomplished in science and engineering.

The joint executive and finance committee in charge this year is composed of four undergraduate members and three representing the Institute. Benjamin S. Kelsey, '28, is chairman of the student group, and associated with him are William M. Hall, '29; William H. Woods, '28; and Ralph T. Jope, '28, President of the Institute Committee. Representing the Institute are Frank L. Locke, '86, chairman of this group, Professor Smith, vice-chairman, and Horace S. Ford, Bursar, without whose aid much that goes to make Open House

Night possible would be unavailable.



NEW CATHODE RAY GENERATOR

The tandem tube developed by William D. Coolidge, '96. It uses 900,000 volts and is three times as powerful as his previous cathode ray tube

T. C. A. Convention

AMONG the decisions made by the Technology Clubs Associated during their convention in New York last June was one to the effect that the Clubs should convene this May, not to transact business, but to indulge in a social holiday. As President Elisha Lee, '92, announced at the time, a Reunion would be held on May 25-26, and the usual double-barrelled *convention* designed for business and pleasure would be held over until 1929 at which time the Western Pennsylvania Club of Pittsburgh expects to be the ram-rod. Word comes that the New York decision is being carried out implicitly and explicitly. As announced in the November Review, the

Hotel Traymore, Atlantic City, is to be the headquarters and the management of that hostelry will handle all registrations and reservations. Plans to date, still somewhat unformed, provide for a dinner dance Friday evening, May 25, as the sole scheduled function. It is felt that meetings and the like would intrude discordantly into the quiet harmony of a perfectly social holiday. Meetings would also compete with the "lure of Atlantic City and its attractions."

Lester D. Gardner, '98, is in charge of plans for the Reunion, but during his sojourn in Europe this winter, Orville B. Denison, '11, has assumed command. Assisting these men will be the Alumni of Atlantic City, ten in number. It is understood that circulars are being mailed out shortly to all members of the Alumni Association residing within 1000 miles of Atlantic City.

Distinctions

HONORARY membership in the Alumni Association has been conferred upon twenty members or former mem-

bers of the Corporation and Faculty, according to a recent announcement of the Executive Committee. Men who have been actively associated with the affairs of the Institute and the Association, never students at Technology, compose the list.

Those elected to membership were A. Lawrence Lowell, President of Harvard University; Frederick P. Fish; and Elihu Thomson, all members of the Institute Corporation. Members of the Faculty elected were Robert P. Bigelow, Davis R. Dewey, William Emerson, Henry Fay, James R. Lambirth, Gaetano Lanza, Dwight Porter, Henry G. Pearson, Winward Prescott, Archer T. Robinson, Robert E. Rogers, and Robert H. Smith. The list also includes Lieutenant Colonels John Bigelow and William Baird, and Colonels Edwin T. Cole, Frederick W. Phisterer, and Harold E. Cloke.

The addition of these names brings the Honorary Membership roster to thirty-two, of whom five are women.

The 132d Meeting

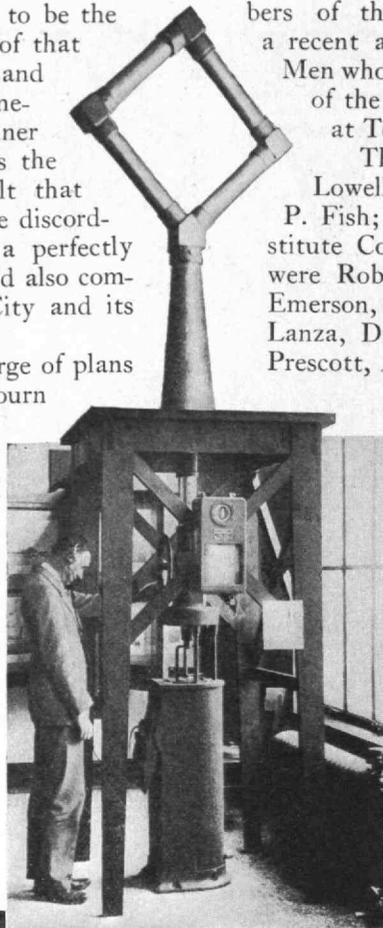
ACCOUNTS of Alumni Council Meetings, like English Restoration comedies, should be preceded by defensive, explanatory prologues, lest the writer unfairly be dubbed a wag or the Council Meetings incorrectly thought a farce. Of late, there have been rumors that both of these things have happened, and The Review's Council Correspondent

is much dismayed, for he has always been impressed by the overwhelming dignity of the august body that convenes in Walker at the beckon of its Secretary's monthly Oyez! Oyez! So impressed has he been that he has striven diligently to write of it in such a manner that even he who runs may read. To record these important meetings in an unembellished and stenographic manner would be unfair to the Council, for then it would probably not be read about at all. The Council Correspondent, operating on the theory, asks commiseration and points out that:

His faults can never hurt another's ease;
His crime, at worst, a bad attempt to please.
Thus, all respecting, he appeals to all,
And by the general voice will stand or fall.

The first notable thing about the 132d Council Meeting was the food. Usually only Bursar Horace S. Ford is privy to such service as the Council received that night. Either Walker has hired a new cook, or the management has invested in a cook book.

So the evening got off to a flying start, gaining enough momentum to last through the report submitted by Orville B. Denison, '11, on his just-concluded trip to clubs and high schools in the South and near-West. This was practically the only item of business on the evening's agenda, and Mr. Denison, sensing that agreeable things were to follow, confined himself to facts and figures. It was gleaned that during his thirty-three day peregrination he covered exactly 5,528 miles, met with 476 Alumni of twenty-two cities, and spoke in fifteen



MARINE MUSEUM

A special exhibition of ancient and modern navigation instruments has been assembled by the Department of Naval Architecture and Marine Engineering. Above is shown the entrance to the Museum and, at the top, a radio compass on exhibition

schools, addressing thereby "2,800 boys and 1,000 girls."

There being no nominations for term membership on the Corporation, Chairman Prescott announced that the remainder of the program would be in the hands of the undergraduate activity leaders who were present, headed by their President, Ralph T. Jope, '28.

Mr. Jope received the baton from Professor Prescott without losing a stride and, after the expression of a gracious sentiment or two, stated that he would call on different activity heads for a brief résumé of the work they have been doing during the past year. Furthermore, he announced that he would limit each man to three minutes, and what is better, he carried out his commendable intention.

The following twelve men spoke, in this order: Thomas S. Wood, Jr., '28, General Manager of *Tech-nique*; Paul E. Ruch, '28, General Manager of *The Tech*; Ames B. Hettrick, '28, General Manager of *Voo Doo*; John S. Middleton, '28, General Manager of *Tech Engineering News*; Paul A. Johnson, '28, General Manager of Tech Show; C. C. Marshall, Jr., '28, General Manager of the Combined Musical Clubs; Donald E. Perry, '28, President of the Athletic Association; Waldo Keyes, '28, President of the Combined Professional Societies; John P. Bailey, '28, Chairman of the Student Dormitory Committee; Oswald V. Karas, '29, of the Architectural Student Council; E. A. Bianchi, '29, of the Walker Memorial Committee; and H. A. Burnell, '28, Chairman of the Budget Committee.

The Council Correspondent is willing to stand back of the assertion that the Council never had presented to it a group of talks so well and tersely presented, so full of humor as well as fact. So much did the Council appreciate these undergraduates that they roundly applauded the spontaneous assertion of C. Frank Allen, '72, that the talks were a tribute to the training given by the Institute.

President Jope concluded with a description of Field Day and its novel and successful glove fight. Later he



Boston Evening American

LT. ALBERT F. HEGENBERGER, '17, AND
MRS. LINDBERGH

The flyer presented flowers to Mrs. Lindbergh on behalf of the Boy Scouts, during her recent attendance at the Boston Convention of the National Education Association. Lt. Hegenberger piloted the plane which carried Mrs. Lindbergh to and from Detroit

was queried by Professor Allen on a touchy matter, and so quick and well turned was his reply and so appropriately impertinent that the Professor was hushed, completely hushed. This, along with the classic description of the genus Brown-Bagger by John Bailey, constituted the evening's two rarest items.

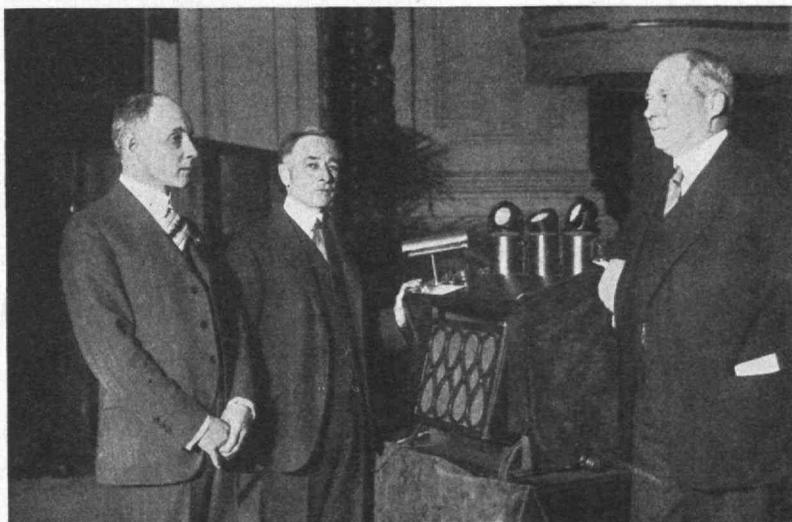
Unreservedly, it can be said that this meeting was informative and enjoyable. It was one of the best things the undergraduates have done this year, and the same may be said of the Council.

Fifty members and guests were present.

Physicists vs. Chemists

CHEMISTS were accustomed to sit as interested spectators on their own side of the boundary line while on the other side physicists struggled with the embarrassing question, "What are atoms made of?" Physicists, however, soon began to encroach on the chemists' bailiwick and then the chemists commenced to take an active part in the development. Today it is sometimes difficult to tell a chemist from a physicist. Nevertheless, Professor Miles S. Sherrill, '99, of the Institute's Department of Chemistry, in presenting the final Society of Arts Lecture of the 1927-28 series on March 9, 10, and 11, declared, "I now tremble as I cross this no man's land into the realm of physics."

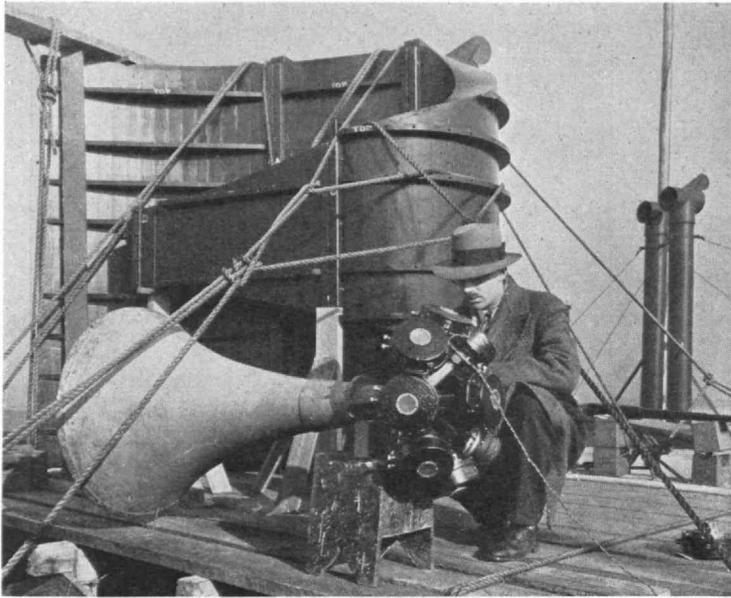
Atoms and molecules, he said, can now be



Wide World

MEETINGS ACROSS THE SEA

Frank B. Jewett, '03, J. J. Carty, and Bancroft Gherardi standing before the Radio-telephone equipment which connected a New York meeting of the A. I. E. E. with a London meeting of the I. E. E. See page 336



GARGANTUAN VOICE

Nine new type loud-speaker units attached to a single boom. On the roof of a building in Manhattan, tests were made of its ability to bellow across the Hudson. See opposite page

counted with more precision than the population of a great city like London. Neither the existence nor the reality of atoms is doubted any longer "for it is possible to determine the number of molecules in one gram molecular weight. This huge number is 606.2 sextillion."

By means of a moving picture the audience was shown the Brownian motion of colloidal mercury particles as seen through an ultra-microscope. These sub-microscopic particles appeared as bright spots which exhibited a lively chaotic motion, caused by collisions with the molecules of the water in which they were suspended. Study of such motion makes possible the counting of molecules.

Later in the lecture, Professor Sherrill demonstrated a device for counting alpha particles, or electrons, ejected at high speed from the unstable atoms of radio-active elements during their spontaneous transmutation. This device, known as a Geiger counter, is a sharp needle in circuit with a high potential, so that a pulse of current passes when the air in its neighborhood is ionized by an alpha particle, or an electron. An amplifier and loud speaker served as detector. A series of distinct raps was heard throughout the entire hall when the lecturer's wrist watch with its radium-painted dial was held near the counter. "These raps," he explained, "are not from a spirit world, but nevertheless from another world, namely the world locked up within the atom. These electrons and alpha particles are the only messengers we have from this world." Attention was called to the use of this instrument in medical science for measuring the rate of blood flow. Dr. H. C. Blumgart of the Boston City Hospital "injects a trace, one quadrillionth of a

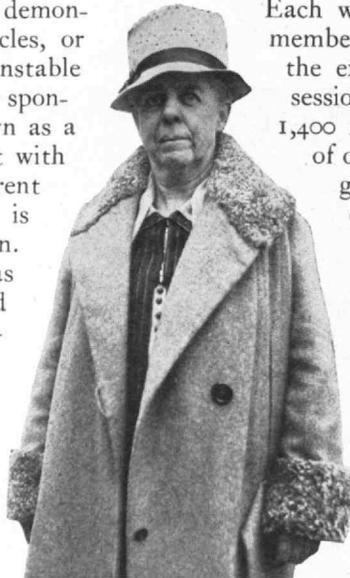
gram, which is about three million atoms, of radium-active deposit in the arm of a patient. Then with the aid of the Geiger counter he measures the time taken for it to be carried to the heart and then through the lungs back to the heart and on to a point in the other arm corresponding to the original point of injection. He is thus able to measure the rate of flow of blood through the lungs. Such studies hold far reaching possibilities for research in diseases of the heart."

Some interesting experiments were shown with nitrogen activated by bombardment with high-speed electrons. The "active" nitrogen in reacting with other chemical substances emitted energy directly in the form of "cold" light, thus producing beautiful color effects.

Professor Sherrill spoke of the significance of the 900,000 volt cathode ray tube recently developed by Dr. William D. Coolidge, '96, (See page 333) of the General Electric Company. He mentioned that this achievement promises the possibility of reproducing in the laboratory all of the most powerful radiations now obtained from radium. A great advantage of this procedure would be that the radiations could be controlled by a switch, whereas the rays of radium are continuous, and constant protection is necessary.

A. I. E. E. — I. E. E.

GOOD morning, Mr. Page," said Bancroft Gherardi, President of the American Institute of Electrical Engineers, in New York one February morning. "Good afternoon, Mr. Gherardi," replied Archibald Page, President of the (British) Institution of Electrical Engineers, in London that same afternoon. Each was on the speaker's rostrum before the members of his society in convention assembled; the exchange of salutations opened the joint session of the two organizations held with only 1,400 miles of land telephone and 6,100 miles of overseas radio circuit to bind the two together. Harry P. Charlesworth, '05, plant engineer for the American Telephone and Telegraph Company, having previously warned the principals that all was ready, stood by to see that the experiment ran smoothly. Mr. Gherardi in New York asked Mr. Page in London to preside over the dual meeting, to which Mr. Page replied by calling upon Mr. Gherardi for a brief speech. Following him in turn came Frank B. Jewett, '03, President of the Bell Telephone Laboratories, Inc., and Colonel T. F. Purves of the British Post Office. When speeches finished, General John J. Carty, Vice-President of the A. T. and T. Company, moved a resolution calling attention to the possibilities for the building of international



Keystone
MARION TALBOT, '88

The Dean of Women, University of Chicago, has become Acting President of Constantinople Women's College until June