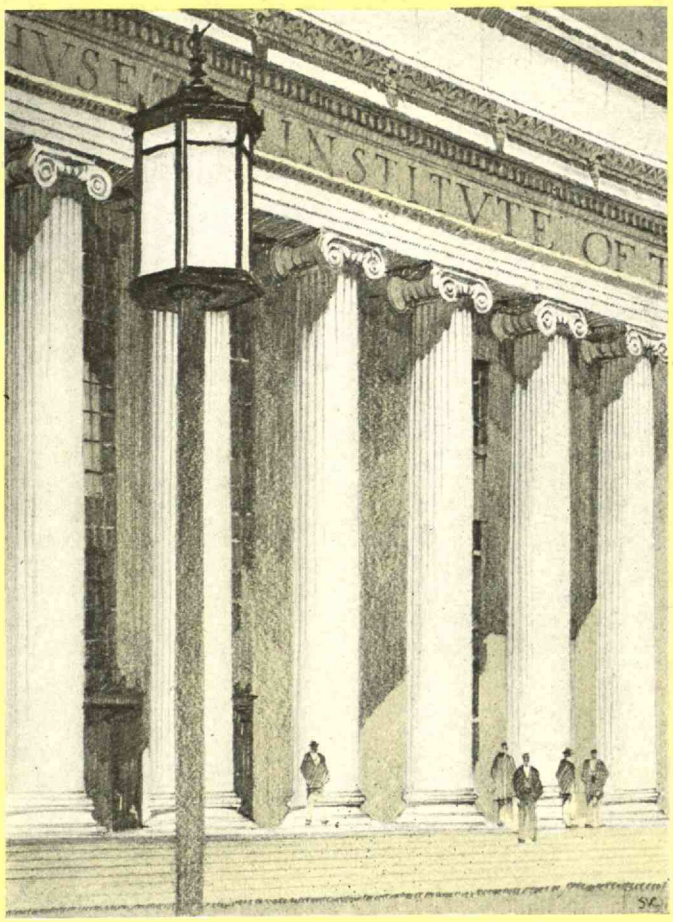
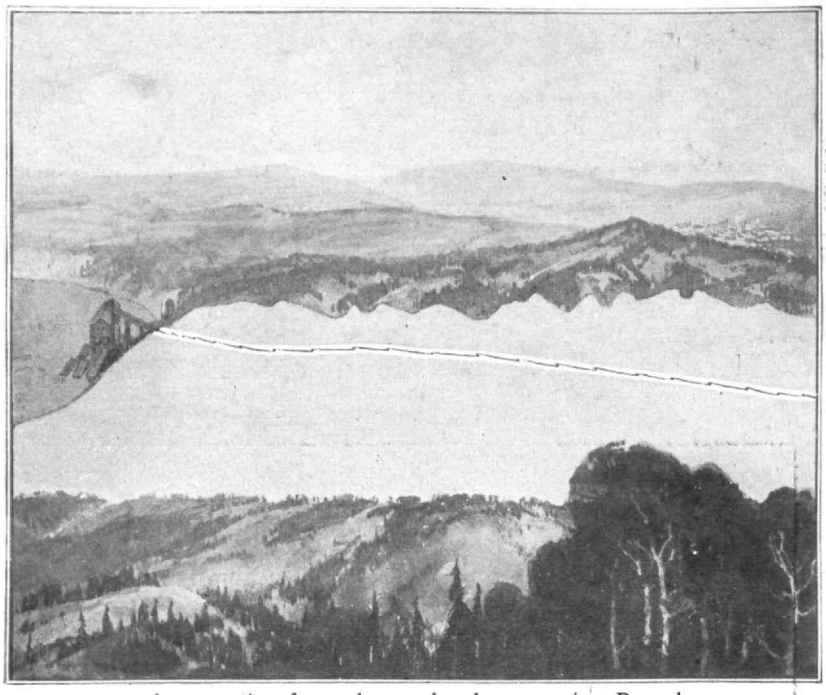
# THE TECHNOLOGY REVIEW



APRIL
1926

RELATING TO THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY



A cross section of an underground coal conveyor in a Pennsylvania mine—a "river of coal" running at a speed of 500 feet a minute, all uphill. The rotary cylinder dump, longer than a city block, empties a 40-car trainload of coal into the hopper, which has a capacity of 1250 tons.

# A wheelbarrow four miles long

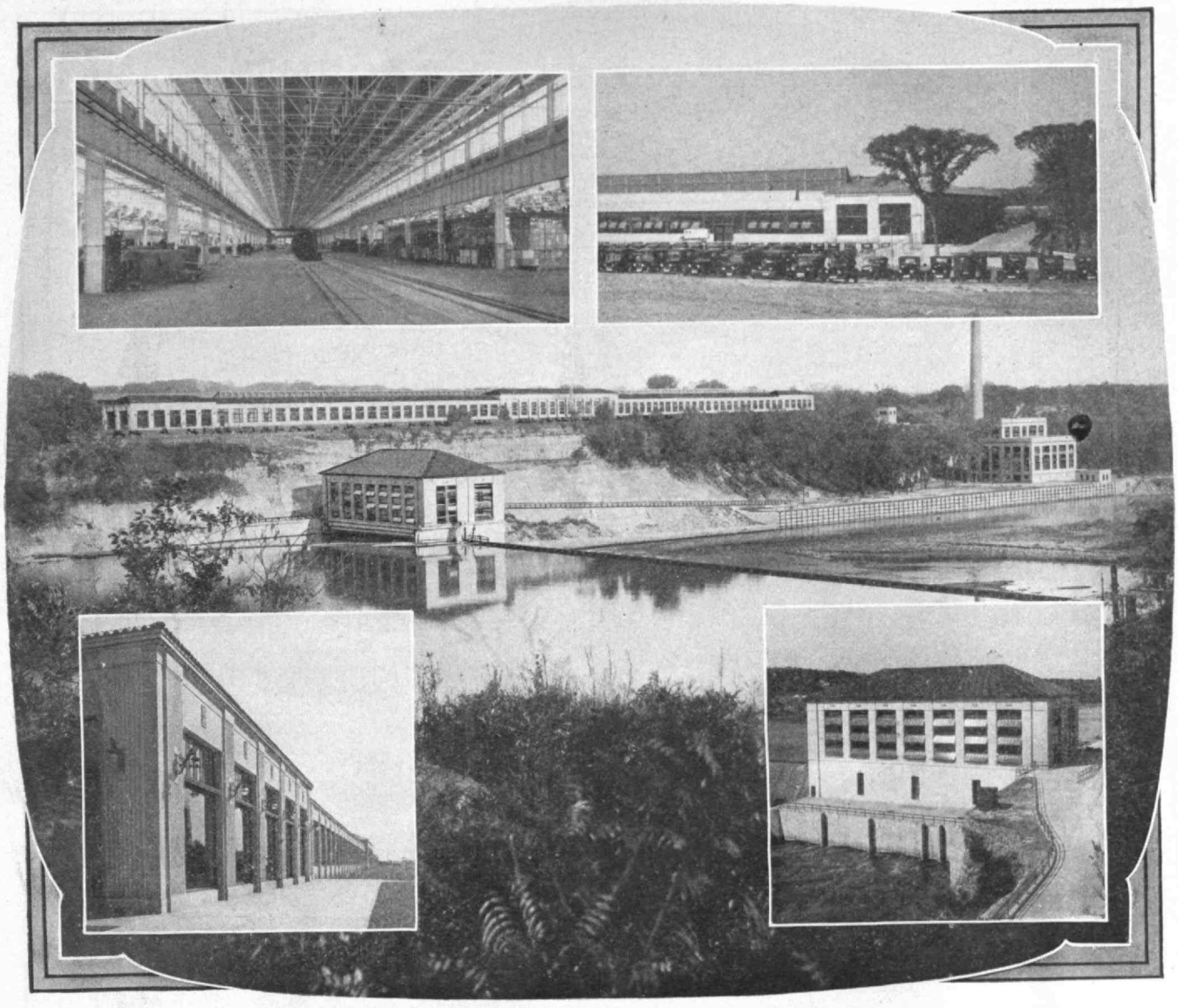
A giant belt conveyor, whirling through a mountain, and carrying 10,000 tons of coal a day from mine to waterfront—it sets a thrift example for the whole world.

Equipped with G-E motors and automatic control, it almost runs itself. Each motor automatically starts its section as soon as the adjoining belt has attained full speed.

You may never need a wheelbarrow four miles long. The chances are all against it. But somewhere in your factory, or office, or home, there is a task that electricity could do better and cheaper. The General Electric Company makes equipment to do that task.

The coal mines of the United States require nearly three million electrical horsepower. To meet this colossal demand the General Electric Company produces locomotives and motors for the conveyors that have displaced the poor old mine mule; it designs motors, large and small, for huge stripping shovels, loaders, fans, pumps, hoists, and undercutting machines—all bear the monogram G-E.

# GENERAL ELECTRIC



# *Ford Twin Cities Plant*

IN this Ford manufacturing plant designed and built by Stone & Webster at St. Paul, Minnesota, the ground area of the single-story main building is nearly 20 acres* and the capacity of the power plants, one steam and one hydroelectric, on the Mississippi, is 25,000 horse power. Albert Kahn was Associate Architect on the main building.

Materials for manufacturing enter the main building and are unloaded direct from the railroad cars. It is planned to have the finished product descend by elevator 100 feet to a terminal chamber and go thence by tunnel 700 feet to a boat landing for shipment by water.

*The building is 1400 feet long by 600 feet wide

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# Another wonderland for Alice

In search of new adventures Alice stepped through the magnifying glass and found herself in the wonderland of telephone making.

Here at the great telephone factory things were coming to life. Little things that she never could see before. Little distances like one one-thousandth part of an inch, that she didn't know were worth bothering about, now became immensely big and proud and important.

And why not? These little bits of things are treated with such great respect and care at the telephone factory.

And that is why your Western Electric telephone is made so well and lasts so long.

**Western Electric**

SINCE 1869 MAKERS OF ELECTRICAL EQUIPMENT

# THE TECHNOLOGY REVIEW

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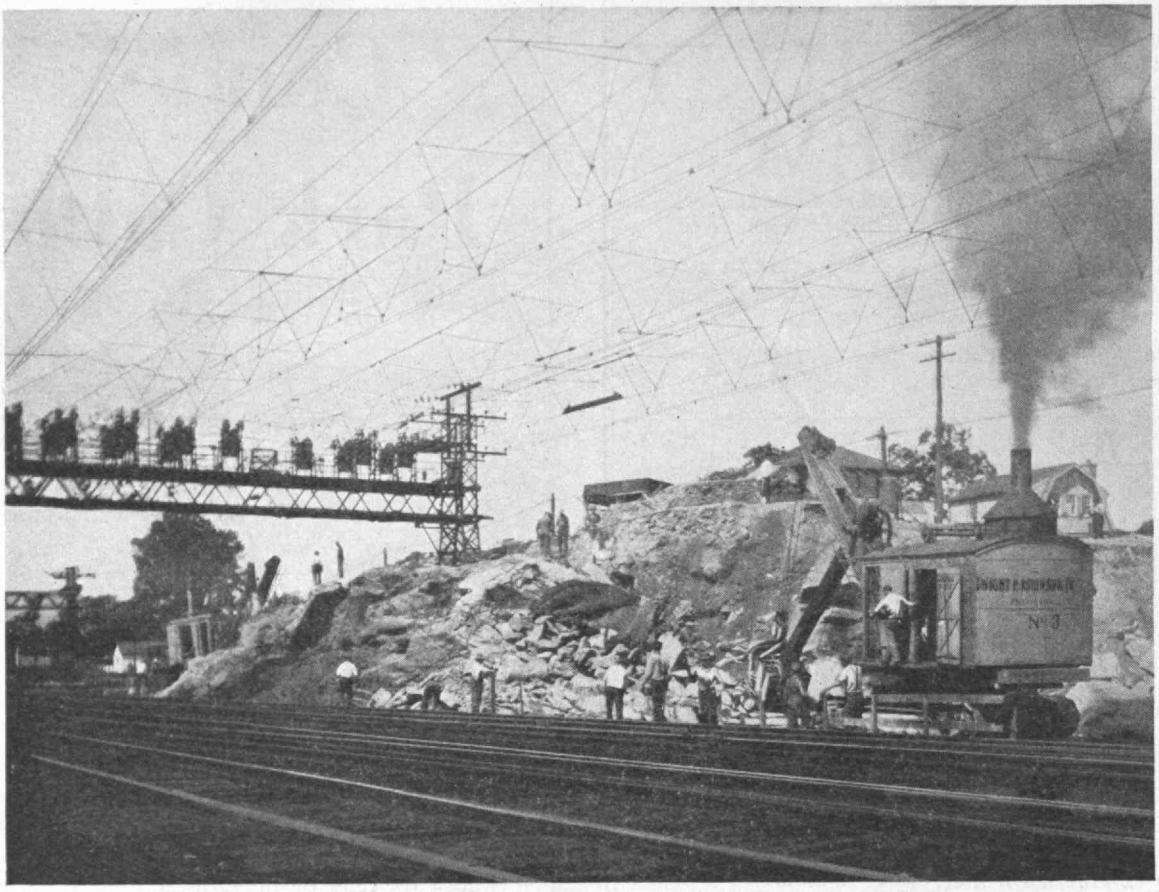

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# The TECHNOLOGY REVIEW

RELATING TO THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOLUME XXVIII · · · APRIL, 1926 · · · NUMBER 6


## The Past Month

COURSE XVI, Aëronautical Engineering, was created by vote of the Faculty at its meeting on March 17 and the Institute's work in aëronautical engineering, started in 1913, passed into a new phase. A regular undergraduate program leading to the Bachelor's degree in Aëronautical Engineering has been laid out and it will henceforth be possible for students to register in that field and to direct their studies toward aëronautical specialization from the beginning of the second year when the first separation of the Courses begins. The action really involves nothing startlingly new, as a considerable number of undergraduates particularly interested in aëronautical work have been registering in the course in General Engineering and taking all their electives from among the aëronautical subjects, most of which were given primarily for graduate students, but were open to seniors who had acquired a proper preparation. However, the emphasis has been on graduate work and it has been impossible to secure a degree specifically aëronautical in four years at Technology, entering as a freshman. Course XVI will serve to stabilize and standardize the program of the would-be designer of airplanes. The graduate work will of course continue to be given as heretofore, and the advanced subjects, for which there is no time in an undergraduate program, will fill a fifth year for those students desiring it. The division between the elementary and advanced parts of the course can now be made more distinct than has heretofore been practicable.

Additional equipment for the Aëronautical Laboratories will shortly be installed.

*From a woodcut by Kenneth Reid, '18*

ELISHA LEE, '92

*The Vice-President in charge of Operation of the Pennsylvania Railroad is the sole nominee for President of the Alumni Association for the year 1926–27*

PIONEER work in aëronautics at Technology began some fifteen years ago, when a few of Professor Lanza's students working under his general direction, made primitive investigations in aërodynamics ("lift and drift") in a little wind tunnel built for the purpose, presenting the results as their theses for graduation. The same students and some others undertook on their own account the design, construction, and testing of two gliders. It was continued when in 1913, Lieutenant Jerome C. Hunsaker, S.M., '12, Sc.D., '16, now Commander Hunsaker and a naval attaché of the American Embassy in London, took charge of the professional instruction in the graduate course in aëronautical engineering. It has been continued without substantial intermission from that day to this, modified during the war into a more intensive form to meet the urgent need of the hour for men trained as speedily as possible.

The Institute's work in aëronautical engineering has a peculiar significance and interest to the Alumni. First, it has been taken in the twelve years, by well over 200 men, and these Alumni have played an important part in the development of American air craft. Among their number are included all officers who have held the post of chief engineer at McCook Field, the experimental station of the Army Air Service; the head of the design branch of the Bureau of Aëronautics for five years during and after the war and, in the industry, the chief engineers of three of the principal airplane manufacturing companies (two of whom are also the executive heads in their respective enterprises).

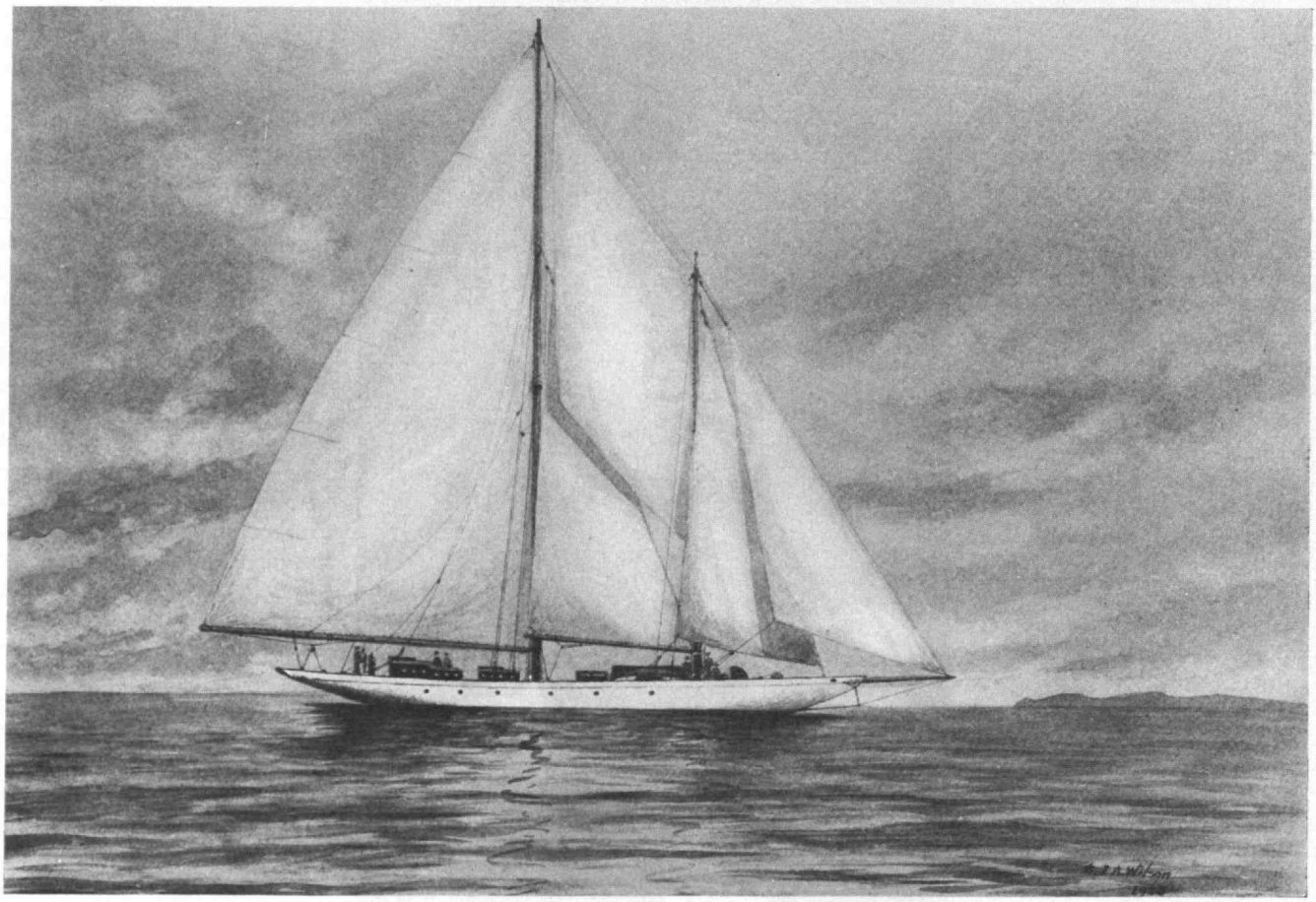
By name, to mention but a few, there are included Donald W. Douglas, '14, Henry M. Crane, '95, Virginius E. Clark, '15, Thomas H. Huff, '15, and William H. Miller and Clinton W. Howard, '22, as well as Commander Hunsaker, and Professor Edward P. Warner, S.M., '17, the Head of what now becomes Course XVI.

Second, and not so generally known, alumni recommendation played a part in the inception of the course. At the first meeting of the Alumni Council, May 12, 1909, with President Edwin S. Webster, '88, in the chair, there was appointed, on motion of James P. Munroe, '82, "a special committee of three . . . to consider instruction in aëronautics . . . and equipment for the same." Henry Howard, '89, was its chairman, Henry A. Morss, '93, and Butler Ames, '96, were the members. The committee reported progress at the second and third meetings of the Council, Mr. Morss giving a report of his investigation in regard to the course in aëronautics at the University of Paris and at technical schools in Germany and England. Less than a year later, at the fifth meeting of the Council a final report was presented for transmission to the Executive Committee of the Corporation and by them accepted. Then, through the vision and enterprise of President Richard C. Maclaurin, who saw the need for scientific study at a time when the airplane and airship were hardly taken seriously, even as instruments of war, came the creation of an opportunity for study in the new and almost unexplored field.

AT about the time this number of The Review reaches its readers the Faculty Club will be getting down to fundamentals. Annually for the past few years it has held a luncheon for the private and public secondary school teachers nearby. This year the festival comes on March 27, in Walker Memorial as usual, and teachers of physics, mathematics, chemistry and biology, as well as principals have been especially sought for.

The "fundamentals" concern the matters which the Society for the Promotion of Engineering Education (of which Dean A. A. Potter, '03, of Purdue is now President) has been investigating under the directorship of William E. Wickenden, former Associate Professor in the Department of Electrical Engineering. Professor Wickenden dealt with his work in an article titled "Live Issues in Engineering Education" in The Review for May, 1924, and more recently recounted his European studies in The Review for January, 1926, his subject then being "The Engineering Scene".

Professor Harry W. Tyler, '84, President of the Faculty Club and Chairman of the Committee on



THE "AYER YACHT"

*This aristocratic craft is the design of Professor George Owen, '94, of the Department of Naval Architecture and Marine Engineering. She is being built on the Adriatic Sea by Niccolo Martinolich, and has been purchased by Nathaniel F. Ayer as flagship of the Eastern Yacht Club at Marblehead. She will rate at the top of Class E, ahead of the* Resolute *and* Vanitie. *The watercolor rendering is by C. J. A. Wilson.*

*See page 318*

Admissions of the Faculty, propounds the following, of which Item 3 alone ought to provide a strenuous afternoon: 1. Should admission to engineering colleges be more strict? 2. Should admission with conditions be given up? 3. Is it desirable to use as additional selective methods pre-engineering collegiate work, experience in industry, a probationary period of review and orientation, intelligence aptitude tests, personal interviews? 4. How can the gap between school and college be diminished? 5. Is it true that nearly every student now entering an engineering college has sufficient ability and aptitude to complete two years of college work?

If the past meetings of this type are criteria, much of interest will be divulged by the discussion. Perhaps the outcome will bear out Dr. Tyler's thoughtful words at the conclusion of the 103rd meeting of the Alumni Council, two years ago last January, at which Dean Herbert E. Hawkes of Columbia, President Clarence C. Little, then of the University of Maine and now of Michigan, and President Arthur E. Morgan of Antioch College discussed "Some Modern Methods of College Admissions." When they had finished and the surge of questions had abated Dr. Tyler predicted to the somnolent Alumni, "We are considering these questions, Gentlemen. I can assure you that in the future it isn't going to be so easy to get into college as you found it."

LAST year President Stratton sent a representative of Technology to various high and preparatory schools with the object of giving potential students a clear understanding of engineering as a profession; to set forth the qualifications and preparations necessary for the man who plans to enter a technical institution and to speak of the opportunities offered by the Institute.

The plan met with such encouraging response, so keen was the desire for information, that the work has been extended to a broader field this year.

A faculty committee was appointed to coöperate in the work and Henry C. Hoar, '26, was chosen to speak to students from the viewpoint of an undergraduate. He and members of the Faculty have visited schools and addressed associations of parents in Maine, Vermont, Massachusetts, Rhode Island, Connecticut, New Jersey and New York.

They found a very definite interest among students, their parents and teachers of the various schools in the problem of choosing a profession. Not only did they answer innumerable questions about engineering and the Institute, but from the students they gained new knowledge of the trend of thought, of the qualifications of individuals for engineering, and no less important, the attitude of teachers in these schools.

The questions most frequently asked pertained to language requirements. Boys wanted to know why French or German is required for entrance; they wished to know what an average day at Technology is like; the advantages of a large school over a small. There were questions on the problem of working their way through school; the earning capacity of engineers, the opportunities in the technical field and the expense incident to professional training at institutions like Technology.

EDWARD P. WARNER, S.M., '17

*Now head of the new "Course XVI", by which designation Aëronautical Engineering will hereafter be officially known.*
*See the account of faculty action on page 309*

In many instances members of the Faculty and Mr. Hoar corrected the erroneous idea that "Tech is Hell" or impressions equally disquieting. The curriculum was gone over carefully with school principals and student advisers in order that they might have a better understanding of the Institute and its work. The entrance requirements were explained in detail and teachers and students were invited to visit and inspect Technology at their pleasure.

Of the value of missionary work among the secondary schools there can be no doubt. It not only gives those students best qualified to enter engineering new light on the subject, but serves to guide others who because of a lack of understanding of what a technical education entails, might enter a field for which they are in every sense unfitted.

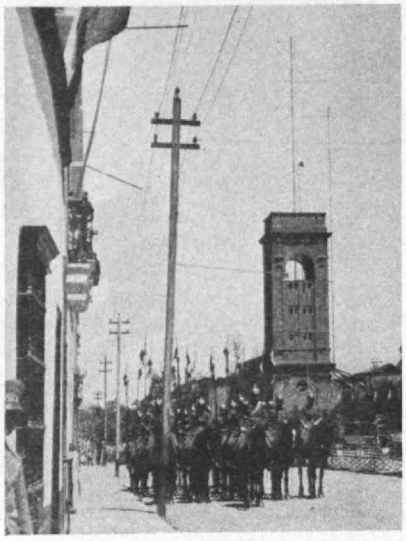
IT is not unlikely that the freshmen who enters Technology in the year 2026 will be served food made from soy beans or peanuts and perhaps bananas. Such is the possibility set forth by Dr. Samuel C. Prescott, '94, Head of the Department of Biology and Public Health, in the last of the series of Popular Science lectures arranged under the auspices of the Society of Arts by its Secretary, Professor H. M. Goodwin, '90.

The series, which opened with a lecture on submarines by Professor James R. Jack, Head of the Department of Naval Architecture, with subsequent discussion on radio by Professor Edward L. Bowles, S.M., '22, and on popular science by Professor William S. Franklin,

was most successful and each lecture was given before capacity audiences.

Professor Prescott, speaking on "The World's Food Supply — Its Sources and Preservation," pictured the problems of feeding the great population of a century hence. Already science is seeking new sources of food and working on methods to conserve the known sources.

Our meat supply of the future may come from the tundras of the Arctic and from the tropics. Land now used for cattle raising will have become too valuable for that purpose and will be given over to agriculture. New uses will be found for the cereals, many of which are now used for cattle food, and mankind will turn more to the sea to satisfy his craving for meat.



TACNA

*The martial spirit runs high, as you will observe from the story of Technology adventure there, on page 315*

The reindeer herds of the North may become one of the chief sources of meat supply, and the tropics, where goats and cattle of some types can be raised, loom as another source.

The need for more efficient methods in raising farm products is already apparent, Dr. Prescott declared, and land now considered unfit for agriculture probably will be utilized for the purpose in the near future.

As the nations of the world go further afield for their food great extensions in methods of preservation must be applied. In refrigeration there is a growing utilization of solid carbon dioxide or "dry" ice. The development of dehydration was predicted as was the possible use of X-rays, ultraviolet and other chemically active rays, and solar energy for food preservation.

Unless new food sources are found, more efficient methods of production and preservation developed or some method devised to synthesize foods from abundant and cheap materials, the world will face a food shortage.

Nor would the United States be exempt from the general proposition. The National Census Bureau estimates the population of this country in the year 2000 as 180,000,000. The present theoretical maximum food supply will be capable of sustaining only 140,000,000.

ON March 10, 1876, Alexander Graham Bell spoke over a wire for the first time in history. The line was fifty feet long. The event was celebrated in Boston on the fiftieth anniversary and, speaking before the Chamber of Commerce, General John J. Carty, chief engineer of the American Telephone and Telegraph Company, which has grown from a system fifty feet long to one of 45,000,000 miles, recalled the early days of telephony.

He spoke of Dr. Bell's years of labor before he finally succeeded in sending his voice over a wire and paid tribute to the men of Technology who gave the struggling inventor the benefit of their knowledge.

Professor Charles R. Cross, '70, former Head of the Department of Physics, was one from whom Dr. Bell sought advice and coöperation when the telephone was being perfected. General Carty in recalling those years of development in transmission of the human voice spoke of his gratitude for the early encouragement given by Technology to Dr. Bell and his assistants, and in the years since for "the continuous stream of magnificently trained, splendid young Americans, scientific boys of character, that have come each year into the Bell System."

SELDOM has an academic criticism of business created more stir than a recent address before the American Academy of Political Science and an article in the January *Atlantic Monthly*, both by Professor William Z. Ripley, '90, of Harvard University. He spoke and wrote against the modern practice of stock issues in alphabetical series which in part (and usually the greater part) carry no voting powers. Dr. Ripley's thesis, called by one newspaper "the problem of the disfranchised stockholder", was tackled boldly by the New York Stock Exchange and its action evoked considerable applause in the press.

The Governing Committee of the Exchange publicly endorsed the statement of its Stock List Committee that it had been compelled to take cognizance of the growing tendency toward "the creation of two classes of common stock, between which the only difference lies in the fact that one class votes while the other class does not." The sale of non-voting stock to the public and the retention of voting control by the bankers or

ARICA

*The harbor of the outwardly peaceful town, taken from an incoming steamer*