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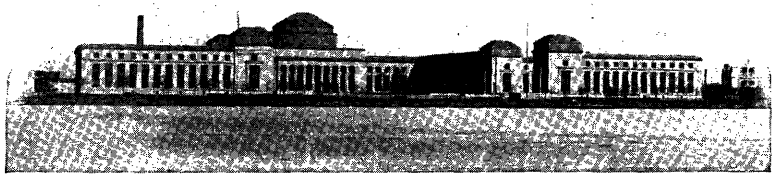

Massachusetts Institute of Technology

President's Report January, 1921

Cambridge, Massachusetts
1921

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

REPORTS OF THE PRESIDENT AND TREASURER

FOR THE YEAR 1919-1920

THE TECHNOLOGY PRESS
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1921

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[1] Address correspondence to Massachusetts Institute of Technology.

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REPORT OF THE PRESIDENT

To the Members of the Corporation:

In accordance with the by-laws I beg to submit to your Corporation a report of the affairs of the Institute, appending, as usual, reports prepared in co-operation with other administrative officers with reference to the work of their special departments.

Changes in the Corporation. During the interval since the last formal report the Corporation has lost three life members by death, and three by resignation. Mr. Arthur F. Esterbrook was elected to membership in 1911 and served continuously as a member of the Finance Committee until his death in July, 1919. Mr. Elliott C. Lee, elected to membership in 1901, served successively as a member of the Visiting Committees of the Departments of Mechanical Engineering, Chemistry and Chemical Engineering, and Physics until his death in February, 1920. Mr. Theodore N. Vail was a member of the Visiting Committee of the Department of Electrical Engineering from the time of his election in 1913 to that of his death in April, 1920. His active interest in the work of the Institute is evidenced by his gift to it of his extensive library of books relating chiefly to the principles and practice of electrical engineering.

Mr. Charles W. Hubbard resigned from the Corporation in December, 1918. His membership began in 1889. He had been a member of the Finance Committee for some years and as a member or chairman of departmental visiting committees his long service was noteworthy for its generous and practical helpfulness in all matters tending toward the improvement or development of the Department. Mr. James P. Stearns, elected to membership in 1901, served continuously on the Finance Committee until his resignation in March, 1920. Mr. John M. Longyear was a member of the Visiting Committee of the Departments of Mining and Geology from the time of his election in 1911 to that of his resignation in October, 1920.

By election to life membership in the Corporation, which occurred in October, 1920, Mr. George Eastman, to whose generosity the present development of the Institute is so largely due, was given a permanent place on its governing body.

The term members retiring in 1920 were Messrs. William H. King, '94, James W. Rollins, '78, and Jasper Whiting, '89. The new term members are Messrs. Matthew C. Brush, '01, Francis W. Fabyan, '93, and Franklin T. Miller '95.

GENERAL STATUS OF THE INSTITUTE

The Increase in Students. The academic year 1919-1920 opened with an enrollment of approximately thirty-one hundred students. This increase, amounting to more than fifty per cent and occurring without warning, necessarily taxed the equipment, particularly of the larger Departments, and placed a severe strain upon the instructing staff. By sub-division of the classes and repetition of courses and by utilizing all available laboratory space for instructional purposes, the added load has been successfully carried throughout the year. The accession of students was proportionately largest in the second-year class, and it has been necessary to equip new laboratories for the accommodation of the two upper classes for the immediate future.

On account of the increase in the number of students taking Machine Tool Work it became evident in the spring of 1919 that additional space and additional equipment would have to be provided. During the past year a considerable number of machine tools of various types has been obtained from the Government (under the Caldwell Bill) at a cost of fifteen per cent of the appraisal value. All of the tools received were in good condition, many never having been uncrated after delivery to the Government warehouses. The equipment of the foundry was increased by the addition of thirty-six new benches, making seventy-two in all, thus doubling the capacity of this laboratory. The departmental reports give details of other similar extension of equipment.

The erection of the Pratt Memorial Building for the Pratt School of Naval Architecture and Marine Engineering, which is now under construction, will soon afford material relief from the congested conditions which obtained during the past year.

The Endowment Fund. During the early weeks of the academic year interest centered upon the completion of the Endowment Fund of four million dollars, which secured the gift of an equal sum offered by "Mr. Smith." The successful ending of this campaign and the identity of the actual donor, Mr. George Eastman, was announced at the Alumni Dinner on January tenth.

The Death of the President. The untimely death of the late President Maclaurin occurred on January fifteenth. The sorrow and overwhelming sense of loss which this sad event occasioned has already found expression in the presidential report of last year.

Organization of an Interim Administration. Immediately following the death of the President the Executive Committee appointed a sub-committee consisting of Messrs. Morss, Hart and Webster to co-operate with an Administrative Committee of three members of the Faculty, which was charged with the duties ordinarily performed by the President in relation to the internal and general administrative affairs of the Institute. The members of this Administrative Committee have co-equal responsibility. The Committee was requested by the Executive Committee to undertake at once a thorough study of the organization of the various Departments and Divisions of the Institute and a complete revision of the salary scale and operating budgets.

On March tenth Dr. Elihu Thomson was elected Acting President with the understanding that he would not be expected to devote his time to details of administration.

The Administrative Committee, as originally appointed, consisted of Professor William H. Walker, Professor Edward F. Miller and Professor Henry P. Talbot, and organized with Dr. Walker as Chairman. On March second Dr. Walker withdrew from the Committee to devote his entire time to

the directorship of the Division of Industrial Co-operation and Research, referred to later, and Professor Edwin B. Wilson was appointed as the third member. The Committee reorganized with Professor Talbot as Chairman. A member of the Executive Committee has attended most of the meetings of the Administrative Committee, and the two Committees have worked in close co-operation.

Salary Increases. An immediate increase in the salary payments to administrative officers and members of the instructing staff was imperative but a proper readjustment of the salary scale could only be made after careful study. A payment of bonuses for the current year was, therefore, determined upon in February, these bonuses to date from January first and to continue through the monthly payments of the academic year.

In April a scale of salaries for the immediate future and the operating budgets for the ensuing year were adopted which represented the result of nearly eight weeks of study and conferences with those in charge of the respective Departments, and with the Administrative Officers. As a consequence of this almost unprecedented opportunity for a general review and comparative study of the various activities of the Institute and the placing of promotions and salary increments upon a more systematic and equitable basis than has been practicable in the recent past, it is believed that the administrative work of the future has been materially simplified.

CHANGES IN ORGANIZATION

Many questions involving probable improvements and economies, and others involving desirable expansion of activities, have been raised during the conferences just referred to, and these questions will receive further study. The intimate and successful co-operation between the Executive Committee, the Administrative Committee and the Faculty which this broad review of the work of the Institute has established gives promise of further constructive developments in the immediate future.

The most important changes in organization concern

the Department of Mining Engineering and Metallurgy, the Department of Geology and Geological Engineering, the Department of Drawing and Descriptive Geometry, and the Department of Chemistry and Chemical Engineering.

Mining and Geology. The Department of Mining Engineering and Metallurgy attained an enviable reputation under the leadership of Professor R. H. Richards. Since the retirement from active service of Professor Richards, the work of the Department has been continued under the charge of Professor H. O. Hofman who has, however, requested that he might be relieved from this service in the near future. The Department of Geology and Geological Engineering, although small in numbers, has been highly successful under the leadership of Professor Waldemar Lindgren, who has attained an international reputation as a geologist and mining engineer of exceptional distinction. It was deemed wise at this period of reorganization to combine these Departments into a Department of Mining, Metallurgy and Geology, with Professor Lindgren in charge. Professor Hofman is in charge of the Option in Metallurgy and it is expected that some one will soon be found to take charge of the Option in Mining Engineering. Under this rearrangement the excellent traditions of the two Departments will be preserved and the future success of the work assured.

Chemistry and Chemical Engineering. The Course in Chemical Engineering, when established in 1888, although then primarily a Course in engineering with the substitution of some chemical subjects for engineering subjects given to mechanical engineers, was combined with the Department of Chemistry. In 1905 the curriculum of the Course was changed in response to the apparent demands of the industries to a Course primarily of chemistry associated with fundamental instruction in engineering.

Under the leadership of Professor W. H. Walker, and later of Professor W. K. Lewis, a unique system of instruction in Chemical Engineering has been developed, and the number of students entering this Course has steadily

increased until it now ranks among those most numerously elected. In close association with this Division of the Department there have been developed the Research Laboratory of Applied Chemistry and the School of Chemical Engineering Practice. In order to give greater recognition and distinction to this branch of the Institute activities a new Department of Chemical Engineering has been established which comprises the instructors in Chemical Engineering, the staff of the Research Laboratory of Applied Chemistry, and that of the School of Chemical Engineering Practice. Professor W. K. Lewis has been placed in charge of the new Department, with Assistant Professor R. E. Wilson as Director of the Research Laboratory of Applied Chemistry and Assistant Professor R. T. Haslam as Director of the School of Chemical Engineering Practice. This segregation, as well as the strong personnel of the new Department, warrant the expectation of successful future achievement.

Architecture and Drawing. For many years Professor A. E. Burton has been in charge of the Department of Drawing and Descriptive Geometry in addition to his arduous duties as Dean. In order that he might devote his entire time to his work as Dean of Students, which has been greatly augmented with the increased attendance at the Institute, he has been relieved of his responsibilities in connection with the Department of Drawing and Descriptive Geometry and this Department has now been reclassified as a Division of the Department of Architecture under the immediate charge of Professor W. H. Lawrence. In the course of years the work of the former Department of Drawing has become more and more confined to the instruction of first-year students, while the instruction in Freehand Drawing has been given mainly to students in Architecture.

Under the guidance of Professor William Emerson, who assumed the headship of the Department of Architecture last year, this Department is also undergoing reorganization which, together with projected developments, assures a continuance and increase of the prestige which it has long enjoyed.

Administrative Offices. The offices of the Dean, the Registrar and the Secretary of the Faculty have also been reorganized to care more effectively for the increasing burden of correspondence and clerical service coincident with the growth in the number of present and prospective students to be cared for.

The Medical Service. The medical service available for the students and staff of the Institute has been considerably expanded. Dr. John A. Rockwell has for many years given loyal service as Medical Adviser, but this has been mainly confined to attendance during office hours and at athletic contests. It is now planned to require medical examination of all first-year students and to provide it for such other students as may request it or for whom the Dean considers it advisable. Ultimately all students will come under the attention of the Medical Director. Arrangements have also been perfected to enable all persons connected with the Institute to obtain prompt medical advice and treatment, including preventive measures, and to care for emergency cases and the work in athletics. Dr. George W. Morse has been appointed Director, with the rank of professor, and will have the needed assistants. New quarters have been provided for his work in the basement of the building.

The Technology Plan. During the campaign for the Endowment Fund there was conceived and established what has become generally known as the "Technology Plan." Under this Plan the Institute entered into contracts with various corporations, firms and individuals to render certain services in return for payments made by them, and, under prescribed conditions, to undertake research work in their behalf. The aggregate payments to the Institute under these contracts will amount to $1,242,075 and the number of contractors has now increased to two hundred and four. To care for this vitally important addition to the work of the Institute it was necessary to establish a new Division, now known as the Division of Industrial Co-operation and Research, and Professor William H. Walker, to whose activities the success of this feature of the campaign was largely due, has been made Director of the Division. He is

devoting himself to the organization of this service, which is still in its formative stage. It already justifies an expectation of great benefit to the Institute and to the contracting parties through greater co-operation and community of interests and through the stimulation of research work in abstract as well as applied science.

ARMY AND NAVY STUDENTS

The Institute has made an arrangement with the Ordance department of the Army to give to the officers in the Ordance Officers' School of Technology certain instruction in Machine Tool Work, in Thermodynamics and in Engineering Laboratory work in the period between September first and October sixteenth. Thirteen officers were detailed for this instruction. The Ordnance Department is also sending seven officers who are to be candidates for an advanced decree.

During the past summer twenty-eight Engineer officers were detailed here for special instruction in the Summer School and for a full year's study leading to the S.B. degree in Civil Engineering. At the beginning of the October term seventeen more Engineer officers were ordered here for a year's study.

The Air Service have sent eight officers for special instruction and the Coast Artillery, the Signal Corps and the Quartermasters Department have each sent officers.

In addition to the forty Naval Constructors, the Navy sent last year two Lieutenant Commanders and two Lieutenants who were to be trained as Torpedo Specialists. One of these officers has been ordered here for special research work along this same line the coming year. This year the Navy is again sending officers for the same training and also three Naval Ordnance officers to be trained as gun specialists.

CHANGES IN STAFF

In October 1919 Colonel Maybach was appointed Military Instructor in place of Colonel Cole, retired. Later in the year Colonel Maybach was transferred and Captain Putney was added to the Military staff. During the summer

of 1920 a number of the officers of the Military Department were assigned to duty elsewhere. Colonel Christian was appointed by the Government as Professor of Military Science and six officers representing different branches of the Reserve Officers Training Corps were assigned here, together with seven non-commissioned officers. The headquarters of the Military Department have been transferred to more ample accommodations in Room 3-310 directly over the President's Office.

The Faculty of the Institute has lost during the year the active services of two of its long-time members. Professor C. H. Peabody has retired from his professorship of Naval Architecture and Marine Engineering and the headship of that Department. His service to the Institute and to his profession has been one of distinction and exceptional loyalty. He has been made Professor Emeritus. Professor J. R. Jack assumes the charge of the Department from which Professor Peabody has retired.

Professor A. A. Noyes has resigned his professorship of Theoretical Chemistry and the directorship of the Research Laboratory of Physical Chemistry to accept the position of Director of Chemical Research at the California Institute of Technology, where under the inspiration of his leadership a large provision has been made for research in Chemistry and Physics. Through his establishment and partial endowment of the Research Laboratory he gave a marked impetus to research in abstract science, and labored constantly to promote the spirit of research in the staff of the Institute with results which are of abiding benefit. This, as well as his contributions to educational methods and his successful administration during two years as Acting President entitle him to permanent appreciation.

The unusually large number of changes in staff which have come about in the various departments may be found recorded in the reports appended.

ELIHU THOMSON,
Acting President.

DIVISION OF INDUSTRIAL CO-OPERATION AND RESEARCH

The organization of this Division is predicated upon the obligations incurred by the Institute of Technology in the contracts entered into between it and certain manufacturing companies under the arrangement now generally known as the Technology Plan. These contracts now number two hundred and four (204) with an annual retaining fee of over one quarter of a million dollars. The performance of the obligations herein involved is undertaken by the faculty and administrative officers of the Institute, and it is the function of this Division to provide necessary means for enabling contractors to present the problems and queries upon which they desire help to those officers of the Institute or members of the faculty in whose department these queries naturally fall, and to make available to the contractors those facilities of the Institute which may be helpful to them.

The experience of the year has shown conclusively that the principles on which the Technology Plan is founded are fundamentally sound and that, while certain details of its administration are still to be worked out, its success is assured. The contractors profit by having at their disposal sources of information not otherwise available; while the Institute receives many advantages. The financial assistance of the Plan is easily appreciated; but in addition the intimate contact established with progressive manufacturing concerns has proved a great stimulus to the educational and research activities of the different departments. The fact that work of moment is being carried on in its laboratories and that great industries are looking to the Institute for the solution of many of their basic problems becomes known throughout the instructional force and the student body, permeating even to the members of the Freshman class. A keener interest is thus taken in acquiring that knowledge and experience which is being daily shown to be of value and importance alike in the enrichment of the individual, and in the progress of the community.

Some of the activities and opportunities of this organization may be considered in detail as follows:

The Library. Although the Institute library comprises the largest collection of books, papers and pamphlets relating to engineering and other technical subjects in the United States, it has been used to only a limited extent by those not directly connected with the Institute. The provision made in the Technology plan under which the library is made very readily accessible to manufacturing companies did not result in a marked increase in the number of those consulting it.

With the strengthening of the library force by the addition of a Reference Librarian and the necessary clerical assistance, this Division attempted to stimulate the use of the library by bringing its value more clearly to the attention of those who should be in position to use it. A letter was sent each contractor and also to each alumnus who had registered with the Division, in which the value of the library and the advantages inherent in its use were set forth. When a personal visit was not possible the Division offered to furnish abstracts of special data, and to photostat printed matter of whatever sort, as well as to make translations from any of the modern languages.

The result has been a very general response from the alumni and a most satisfactory increase in the number using the library.

M. I. T. Who's Who. The record of the qualifications, experience, and special knowledge of the alumni, which the Institute agreed to provide and maintain, has taken the form of what has been termed an "M. I. T. Who's Who." Requests for the necessary data for compiling this record from which would be obtained information regarding men for permanent employment, information regarding men who had knowledge of special problems, and information as to where special knowledge and experience could elsewhere be found received a very satisfactory response, and a list of 5237 former students of the Institute is now available. The information contained in these replies has been classified according to the Litchfield System and has been of great value in meeting the demands made upon the Division.

While this record was assembled primarily for the benefit of the contractors under the Technology Plan it seemed feasible and eminently desirable that those alumni who had taken the interest to list themselves in Who's Who be given the advantage of the interchange of information which the possession of this list

makes possible. Therefore a letter was sent to those names making up the M. I. T. Who's Who in which the Division offered to act as a clearing house for exchange of special knowledge of whatever kind, and invited the alumni to send it such inquiries as they may from time to time have.

This letter received a very favorable response and it is believed that an extension of this service will furnish a means of more closely joining the alumni and their interests to those of the Institute.

Placing the Undergraduates. Although the heads of the various professional departments, because of their intimate personal knowledge of the men of the graduating class, are in the best position to recommend these men for positions, this Division has undertaken to make more readily available to the contractors under the Technology Plan the records and qualifications of students as they finish their course at the Institute, and in connection with the heads of departments to arrange for personal interviews with them. This endeavor will supplement, rather than displace, what is now being accomplished by the different departments in placing their men, and has proved a welcome aid in this work.

Industrial Research. While many of the queries and problems submitted to this Division for solution can be satisfactorily answered by consultation with members of the faculty, a large number are of such a difficult nature as to require some kind of experimental work in order that the data necessary for an intelligent opinion can be obtained. Research of this type demands not only minds capable of directing it, but also men and facilities for carrying on the experimental work itself. Furthermore it is seldom the case that a problem as submitted by a manufacturing company involves the technique and facilities of only one department of science. While many of the difficulties are purely mechanical in their nature, the great majority of manufacturing problems involve both chemistry and physics in one or more of their many forms for their ultimate solution. It is for this reason that the Institute of Technology is pre-eminently fitted to carry on industrial investigations of a very diverse nature. Specialists in every branch of both pure and applied science are at hand, capable and willing to advise regarding the major outline of the investigation and also the details for its execution.

Up to November 6 the Division had handled 470 queries from contracting companies. Those that can be easily classified have fallen within the departments of the Institute as shown in the following table:

Department	Research Personnel	
Civil Engineering	6	12
Mechanical Engineering	73	29
Mining Engineering	10	5
Architecture	0	3
Chemistry	37	14
Electrical Engineering	23	11
Biology and Public Health	8	0
Physics	21	1
General Science	0	0
Chemical Engineering	92	32
Sanitary Engineering	2	
Geology	3	
Naval Architecture	3	
Electrochemical Engineering	3	
Engineering Administration	13	14
Library	23	
Research Laboratory of Applied Chemistry	29	

While the terms of the contract provide that the expenses incident to the prosecution of research work shall be borne by the contractor, it has been found indispensable in some cases, in order to establish confidence in the ability of the Institute to attack successfully and profitably problems affecting their particular interests, to carry out certain tentative preliminary researches without immediate expense to the contractors. Limited funds have been set aside for this purpose with very satisfactory results. This procedure has not been necessary in the case of those contractors who had an acquaintance with the Institute and its facilities previous to the time of the contract.

Research in Abstract Science. At the time of the establishment of the Technology Plan the impression prevailed among some educators that the work entailed in the execution of the contract would stifle research in pure science, and would therefore in the end prove a detriment rather than an aid in the scientific progress of the community. This view was entirely erroneous. The great industrial corporations with their broad outlook toward the future have no such view and, as a matter of fact, the Plan has enabled

us specifically to provide for carrying on research in pure science. Under this provision an annual sum, now $6000 and constantly growing, is available, and is already showing that, so far from stifling pure research, the Technology Plan is a direct stimulus to workers in this field. A part of the fund is being used in the support of research carried on at the Institute, while an almost equal portion is being expended in the support of work not at the Institute nor in any way connected with it.

WILLIAM H. WALKER.

REPORT OF THE LIBRARIAN

Increased Use. This has been a remarkable year, chiefly because of the very great increase in attendance of students. The very marked increase in the attendance in the Library is due in part to the larger number of students, and in part to the return to normal conditions of the Institute. In the Central Library the number of books lent has increased from that of the previous year more than 70 per cent, and the Departmental Libraries that reported on circulation show even greater increase.

As usual the Central Library has been open during term time in the evening until 10 P.M. except on Saturdays when it was closed at 4 P.M. This attendance in the Library also shows a marked increase.

The number of calls from other Libraries for inter-library loans has been about normal, 64 books having been lent, and we in return have borrowed 6. In addition to the inter-library loans, properly speaking, we have lent a good many books to corporations who are contractors in the Technology Plan, and the Library has co-operated both in the lending of books and assisting investigators with the Division of Industrial Co-operation and Research.

Accessions. The total accessions to the Libraries of the Institute amounted to 5047 items, of which 1862 were obtained by purchase, 1011 by binding of periodicals received in parts, and 2174 by gift.

These additions bring the total contents of the Libraries of

the Institute on June 30, 1920, to 140,730 volumes and 51,498 pamphlets and maps. Twenty-five years ago, when the present incumbent became Librarian of the Institute, the total contents of the Libraries was 37,654 volumes and 11,922 pamphlets and maps. The mean annual increase during these 25 years has been 4123 volumes and 1583 pamphlets and maps.

During the year covered by this report the Institute had on its subscription list 865 periodicals which were estimated to cost $2,994.03 per annum.

Most of these periodicals have been received, but there are still a few of the German and French periodicals which have not resumed publication since the war. As stated in the previous report, we succeeded in obtaining most of the periodicals published in Germany and Austria during the years 1918 and 1919. It was done through the assistance of the American Library Association, represented by Dr. Raney. This left a gap of one year, our previous subscriptions having expired at the end of 1916. The periodicals for 1917 were ordered directly from Germany and for the most part have been received under very favorable terms.

The General Catalogue was increased by 4630 cards net, so that at the end of the year the catalogue contained in all 155,905 cards. The number of entries in the catalogue on September 30, 1895, was 34,871, making an increase in twenty-five years of 121,034 cards. During the year 2049 orders were issued for the purchase of books and 983 for binding.

Vail Library. The cataloguing of the Vail Library has practically been completed. During the year 665 books and 289 pamphlets were catalogued, and 3269 cards were added to the catalogue of the this Library. There are still remaining a number of books to be bound and 463 books and 12 pamphlets were sent to the bindery for binding and lettering. The collection was increased by 271 volumes, of which 228 were obtained by purchase, 27 by binding of periodicals received in parts, and 16 were received as gifts.

The Vail Library, in its convenient location on the third floor of the Central Building, proved to be very useful under the skillful administration of Miss Bell. In that situation, however, the Vail Library served a limited group of readers, and it is believed

that it will have a wider use in the new location that has been prepared for it in the main book stack of the Central Library.

Personnel. The work of the Library has been considerably hampered by vacancies in the Library Staff. During the year we lost by resignation four members of our professional staff, for the most part to fill better positions in other libraries. Fortunately the end of the fiscal year finds us with these positions all filled, and the Library Staff greatly strengthened by the creation and filling of three new positions. The most important of the new positions is that of Reference Librarian, which has been filled by the appointment of Mr. Nathan Van Patten, who came to us from the College of the City of New York, where he had been very successful as Librarian of the Walcott Gibbs Chemical Library.

With these additions to the Library Staff we look forward to the coming year with confidence in greatly improved service by the Library.

Gifts. The Institute has been fortunate in receiving a large number of valuable gifts amounting in all to over two thousand items. The Earl of Camperdown has continued to supply us with the publications of the Institution of Civil Engineers and of the Institution of Naval Architects. From the University of California were received a collection of forty-two handsomely bound volumes of the semi-centennial publications of the University. Señor Francesco Ravecca of Montevideo has presented to the Institute, through his son, Francesco Ravecca, Jr. of the Class of 1922, a collection of eighteen volumes of Uruguaian literature. These volumes are the first installment of a collection which is to be presented to the Institute by members of the Latin-American Club, and for which special arrangements are to be made in the General Reading Room.

Among the other gifts may be mentioned the following:

DONORS AND GIFTS

Aberthaw Construction Co. — Mayers: Estimating Concrete Buildings.
John Barrett. — Second Pan American Commercial Conference.
W. N. Best. — Best: Science of Burning Liquid Fuel.
Botanical Garden, Rio de Janeiro, Brazil. — Carrea, M. P.: Fibras Texteis e Cellulose.
Brier Hill Steel Co. — Brier Hill Reference Book.
Louis J. Calder, 1922. — Howe: Great Private Citizen, H. L. Higginson.
W. M. Camp. — Camp: Railroad Transportation at the Universal Exposition.

Carnegie Endowment for International Peace. — U. S. Diplomatic Correspondence, three volumes.
S. S. Carpenter. — The Boiler Maker, Vol. 19.
Class of 1921 M. I. T. — Technique 1921, Vol. XXXV.
Prof. C. R. Cross. — Rept. Brit. Assoc. Advancement of Science, 87th volume.
W. Myron Davy. — Davy & Farnham: Microscopic examination of ore minerals.
George H. Doran Co. — Bennett: Frank Swinnerton.
J. W. Ellms, '92. — Ellms: Report Experiments in Purification of Water Supply, Milwaukee, Wis.
Prof. W. S. Franklin. — Slosson: Easy lessons in Einstein.
L. J. Garcy. — Faure: Wanderings in Italy.
J. H. Geijsbeck. — Ancient double-entry book-keeping.
Capt. L. B. Griffith. — 2 volumes, Official History 2d Engineers in World War.
H. E. Hershey. — Hershey: Automatic Telephone Practice.
H. McL. Harding. — Harding: Quay Designs and Pier Designs.
F. C. Hoffman. — 3 years' subscription *Illustrated Review.*
Prof. G. L. Hosmer. — Hosmer: Geodesy.
Prof. W. Hovgaard. — Hovgaard: Modern History of Warships.
Col. Mark L. Ireland. — Manual of motor transport corps, regulations for standard motor vehicle operation, repair park operation.
F. E. Kip. — Kip: Equal Opportunity for All, Tariff Facts and Effects.
Korean Commission. — McKenzie: Korea's Fight for Freedom.
Lepper, G. H. — Lepper: From Nebula to Nebula.
Prof. W. Lindgren. — Mineral Deposits, Ed. 2, 1919.
J. B. Lippincott Co. — Watson: Psychology.
Little, Brown, & Co. — Eleventh Hour in the Life of Julia Ward Howe, by Maud Howe.
Prof. C. L. E. Moore. — 2 volumes, Ganguli: Lectures on Plane Curves.
James P. Munroe. — Munroe: Human Factor in Education.
National Aniline and Chemical Co. — Dyestuffs, Vol. 20.
J. O'Grady. — National Catholic War Council: Fundamentals of Citizenship.
Old South Church, Ministers and Officers of. — Two Hundred and Fiftieth Anniversary of Founding of Old South Church.
Prof. C. H. Peabody. — Fyfe: Steamship Coefficients; 2 volumes, Routh: Dynamics of a System of Rigid Bodies; 2 volumes, Thearle: Modern Ship-Building.
Prof. D. Porter. — Gerhard: Cast-Iron Pipe for House Drainage.
Princeton University Press. — Goddard: Human Efficiency.
G. P. Putnam's Sons. — Foulke: Fighting the Spoilsman.
W. H. Reed. — Edwards: Twenty-five Years in Black Belt.
George L. Roberts, Esq. — Danneman: Geschichte d. Naturwissenschaften, Vol. 1.
Prof. A. T. Robinson. — 38 miscellaneous books, 4 pamphlets.

Royal Italian Embassy. — Pons: The Holocaust, Military and Financial Effort of Italy during the War.
R. B. Small. — Bennett: History of Panama Canal.
E. F. Smith. — Smith: Chemistry in Old Philadelphia.
State Library. — Lyle: Official Railway Manual.
Dr. R. P. Strong. — Proceedings of the Medical Conference, Commission of Red Cross Societies, Cannes, France.
Prof. George F. Swain. — 4 volumes, Civil Engineering Subjects; 2 volumes, Schell: Theorie der Bewegung und die Kräfte.
E. F. Taxton. — Hergesheimer: Hugh Walpole.
Prof. C. E. Turner. — Collection of war posters.
Nathan Van Patten. — Moody: Textbook on Quantitative Analysis; Kaempffert: Discovering New Facts About Paper.
Prof. Frank Vogel. — Hills & Ford: First Spanish Course.
Prof. W. H. Walker. — Levesque: Art of Brewing and Fermenting.
J. G. White Engineering Corp. — Martin and Coles: Story of Electricity.
Dr. N. Wiener. — Lewis: Survey of Symbolic Logic.
Prof. E. B. Wilson. — Carmichael: Theory of Relativity; Wilson: Aeronautics.

ROBERT P. BIGELOW.

REPORT OF THE DEAN

The question of properly housing the students attending the Massachusetts Institute of Technology is of vital importance at the present time. Unusual efforts have been made by advertising and by personal investigation to secure a list of suitable rooms, and to Mr. Wallace Ross, the Secretary of the Technology Christian Association, is due the credit of compiling a list of over two thousand boarding-houses in Cambridge and vicinity. Accommodations, however, are in many cases inadequate, and the prices are unusually high. A great many of our students are this year living under conditions which are not conducive to either health or study.

During the prevalence of influenza in the latter part of the year 1919 it was necessary that visits should be made to many of the students living in lodging houses, and the result of these visits has been to impress on the mind of the Dean that one of the most urgent needs in the development of the Institute is the erection of new dormitories. The Institute possesses at the present time a small dormitory unit, but as it accommodates only one hundred

and seventy students it is not a material relief to the general situation. It has, however, given an opportunity to initiate a system of undergraduate management which has proved satisfactory.

It is important for the Corporation and Faculty to realize that the assumption of responsibility by a student is a great factor in his education. At the Institute we have for many years encouraged student control of extra curriculum activities, and we now have a well organized student government, which among other things looks after the administration of the Walker Memorial and the supervision of student life in the dormitories. It is with much gratification that the Dean is able to report that the undergraduate organization has successfully survived the war period, and is now doing excellent and effective work.

Department of Physical Training. Physical examinations were taken in October, 1919, and April, 1920, and charts plotted showing improvement in measurements and strength tests between the two periods. From these results plus the general class work the five Cabot Medals were awarded as follows: S. A. Guerrieri, '23, W. B. Greenough Jr., '23, H. J. Verner, '23, S. R. Evans, '23, and J. D. Cochrane, '23. The five men receiving Honorable Mention were, W. Merzbach, '23, J. B. Nason, Jr., '23, A. Isaacson, '23, E. C. Palmer, '23, and W. E. Appleton, '23.

The number of men who took regular exercises in gymnasium classes or athletics, the distribution of the latter among the various branches, and the number of those excused for physical ailments are given in the following table:

Term	*Gymnasium*	*Track*	*Wrestling*	*Swimming*	*Boxing*	*Gym Team*	*Tennis*	*Baseball*	*Crew*	*Fencing*	*Excused*
First.....	598	65	24	18	11	10	..	..	..	..	6
Second.....	509	50	13	11	14	9	..	..	..	..	12
Third.....	495	58	..	..	6	7	31	21	19	4	11

ALFRED E. BURTON.

REPORT OF THE REGISTRAR

The Registration for the past year was far above that for any year previous. On November first the number of students reached 3078, a gain of 69 per cent in one year and 57 per cent over the

registration of 1916-17 which until this past year was the largest in the history of the Institute. This very large registration was due to the unusually large second year class which was made up not only of the very large first year class of the year previous but also of an inflow of many students from other colleges. It was further due to the fact that the small fourth year class was replaced by a much larger senior class. While the number of students from other colleges in 1918-19 was large enough to make the proportion of such students just over 20 per cent, this proportion of students from other colleges among our students rose to 35 per cent this past year. Among the upper three classes it was 40 per cent. The Course in Chemistry had the largest proportion of such students. In this Course, too, graduates are more numerous than non-graduates. In Mining Engineering, Architecture, Chemistry, Electrical Engineering, Biology, Geology, and Naval Architecture, the proportion of students from other colleges is above that for the whole school.

If the number of students for the past year is reviewed according to their homes, it may be noted that the increase of students over last year from districts farther away is greater proportionately than from the immediate vicinity. The increase in per cent of students from the North Atlantic States is less than the increase in per cent of the whole student body. The percentage increase from the Western States is greatest of all. In order of percentage increase, the South Atlantic States follow the Western States and the North Central States are third in order. The number of foreign students continues to increase. The first three countries named in the order of the number of students they sent to the Institute last year are China with 40, and Canada and Norway each sending 38. The total from all the countries is 205 or about seven per cent of the student body. Thirty-two countries are represented by our foreign students.

In computing the average age of the classified students of the first year, an increase as compared with the average age of the first year students for a number of years is found. The average age has been fairly constant, around 18 years and 11 months. This year it is found to be 19 years and 3 months. This increase is due partly to the larger number of first year students who have already attended college elsewhere, but undoubtedly it is also due to the

fact that a considerable number of students have had their preparation interrupted by war activities.

Among the professional Courses, Mechanical Engineering continues to lead the other Courses in numbers by a large margin; next in order of numbers is the Course in Chemical Engineering and close to this one is that in Engineering Administration. Comparing the registration of the Courses with that of 1916-17, the last normal year, when the Institute occupied the new building for the first time and just prior to our entrance into the war, among the engineering Courses, that in Engineering Administration shows the greatest gain in percentage increase. This is followed, in this order, by Chemical Engineering, Mining Engineering and Electrochemical Engineering. Only the Course in Sanitary Engineering is smaller than during that year of large registration. The proportional increase in Engineering Courses as compared with that in the Science Courses is 76 per cent as compared with 29 per cent. In the General Course the numbers have risen from 4 to 33. The Course in Architecture has not as yet regained its loss in numbers.

The third Junior Grade first year class entered in January, 1920, and numbered 95. By Faculty vote this plan of admitting a new first year class in January is not to be continued.

The Scholarship Committee of the Faculty recommended awards of $31,729.50 to undergraduate students. There were 588 applicants for scholarship aid; 230 received awards from the Institute and 128 received State scholarships; 100 of them held one-half scholarships. A total of 358 students received aid, two of them received part from the State and part from the Institute.

To provide for the increased responsibilities assigned to the Registrar's Office, a Manual of Routine has been prepared for the office work. The office is divided into five sections: Correspondence, Publications, Information, Records and Rolls, and Tabular View and Room Scheme. To the section of Correspondence besides the general correspondence of the Institute, the routine work of the Faculty Committee on Admissions is assigned. Dr. James L. Tryon, a newly appointed Assistant Registrar, has been made director of this section. Besides having taught in our English Department, he has taught elsewhere and has already held important executive positions. His interest in human problems makes him

particularly well qualified to receive the visitors to the Institute and applicants for admission.

A new section of the office is that of Publications. During the last few years the increased demand for information has been so great that the editions of the Institute publications have been quickly exhausted. Because of the numerous changes in curricula and regulations, it has seemed unwise to print editions that will supply the demand for a long period, hence the work on the publications has increased materially and a separate section is provided for this important work. This section also assists the Committee on Publications of the Faculty in caring for the reprints of scientific research of members of the Instructing Staff. Miss J. M. Comstock, who has a long and exceedingly loyal record of service in the Registrar's Office, is in charge of this section. She brings to the section an unusually intimate knowledge of the Institute's requirements and regulations. Much of her time has already been given to the publications, but now it is her primary responsibility.

During the study of the reorganization of the office, through the courtesy of Stone and Webster, Mr. Edward F. Flynn was able to visit the office frequently and to give most valuable assistance and suggestions. His experience in executive organization was a most fruitful source of inspiration. His untiring efforts are acknowledged with much gratitude.

The usual tables of statistics follow.

WALTER HUMPHREYS.

The Corps of Instructors

November 1	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19
Professors: Emeriti	1	1	1	1	1	1	1	1	1	3	3	3	4	4	4	5	5	5
Retired	..	..	..	..	..	1	1	1	1	3	3	3	4	5	7	7	6	6
Non-Resident	2	2	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2
Research (Not counted elsewhere)	..	..	..	..	..	..	..	..	..	4	3	1	1	..	..	..	..	..
Total	3	3	4	4	4	5	5	5	5	13	12	10	12	12	13	14	13	13
Professors	27	27	25	32	36	39	39	43	43	40	47	46	59	63	61	59	58	52
Associate Professors	12	14	17	14	17	17	17	14	18	17	16	23	23	23	30	32	29	33
Assistant Professors	25	25	19	24	21	24	32	31	30	33	35	33	36	31	36	38	33	39
Active Faculty	64	66	61	69	74	80	88	88	91	90	98	102	118	117	127	129	120	124
Instructors	54	66	67	72	69	72	62	69	66	64	67	74	70	79	90	70	67	99
Assistants	46	51	56	53	52	52	50	51	55	50	49	54	52	58	54	38	35	39
Faculty, Instructors and Assistants	164	187	184	184	215	204	200	208	212	204	214	230	240	254	271	237	222	262
Research Associates	..	..	..	6	8	8	6	12	8	5	3	1	3	3	5	4	1	8
Research Assistants	..	..	..	4	3	3	1	1	5	6	7	8	15	11	14	7	5	10
Lecturers	39	41	33	39	31	32	31	18	21	25	16	19	23	28	31	29	13	13
Total Active Members	203	228	217	332	257	247	238	239	246	240	240	258	281	296	321	277	241	293

Yearly Registration since the Foundation of the Institute

Year	Number of Students	Year	Number of Students	Year	Number of Students
1865–66	72	1883–84	443	1901–02	1,415
1866–67	137	1884–85	579	1902–03	1,608
1867–68	167	1885–86	609	1903–04	1,528
1868–69	172	1886–87	637	1904–05	1,561
1869–70	206	1887–88	720	1905–06	1,466
1870–71	224	1888–89	827	1906–07	1,397
1871–72	261	1889–90	909	1907–08	1,415
1872–73	348	1890–91	937	1908–09	1,462
1873–74	276	1891–92	1,011	1909–10	1,481
1874–75	248	1892–93	1,060	1910–11	1,509
1875–76	255	1893–94	1,157	1911–12	1,566
1876–77	215	1894–95	1,183	1912–13	1,611
1877–78	194	1895–96	1,187	1913–14	1,685
1878–79	188	1896–97	1,198	1914–15	1,816
1879–80	203	1897–98	1,198	1915–16	1,900
1880–81	253	1898–99	1,171	1916–17	1,957
1881–82	302	1899–00	1,178	1917–18	1,689
1882–83	368	1900–01	1,277	1918–19	1,819
				1919–20	3,078

The Students, 1919-1920

Registration by Classes	Total
Candidates for advanced degrees	91
Fourth year	480
Third year	759
Second year	1,050
First year	698
Total	3,078

Students by Courses* for the Year, 1919-1920

Year	Civil Engineering	Mechanical Engineering	Mining Engineering and Metallurgy	Architecture	Chemistry	Electrical Engineering	Electrical Engineering VIa	Biology and Public Health	Physics	General Engineering	Chemical Engineering	Sanitary Engineering	Geology and Geological Engineering	Naval Architecture	Naval Construction	Electrochemical Engineering	Engineering Administration	Aeronautical Engineering	Mathematics	Total
Graduate	9	8	1	1	18	17	—	3	—	—	14	—	7	4	—	6	—	2	1	91
Fourth year	57	96	21	31	9	43	—	33	1	3	78	6	—	12	17	12	61	—	—	480
Third year	84	169	33	33	20	81	20	8	4	13	137	4	3	22	—	20	108	—	—	759
Second year	105	199	48	54	19	144	—	12	10	17	152	14	5	28	1	36	206	—	—	1050
Total	255	472	103	119	66	285	20	56	15	33	381	24	15	66	18	74	375	2	1	2380
First Year																				698
																				3078

*First-year students do not elect their courses until after this report is prepared.

TOTALS OF THE SAME CLASSIFICATION* SINCE 1907

Year	Engineering Courses												Total of Engineering Courses	Architecture	Science Courses				Total of Science Courses		
	Civil Engineering	Mechanical Engineering	Mining Engineering	Electrical Engineering	Chemical Engineering	Sanitary Engineering	Naval Architecture	Naval Construction	Electrochemical Engineering	Engineering† Administration	Aeronautical Engineering	General Engineering			Chemistry	Biology	Physics	Geology		General Science	Mathematics
1907–08	210	227	118	202	59	39	37	16	—	—	—	—	908	84	53	17	21	0	91	2	—
1908–09	197	197	104	209	71	52	41	13	—	—	—	—	884	91	60	20	19	2	101	4	—
1909–10	207	204	99	203	84	60	41	14	14	—	—	—	926	109	44	22	4	1	71	4	—
1910–11	220	198	90	210	128	46	26	9	26	—	—	—	953	113	44	19	7	0	70	2	—
1911–12	217	214	79	203	129	57	19	8	35	—	—	—	961	112	56	20	4	2	82	3	—
1912–13	212	243	50	201	149	55	29	6	42	—	—	—	987	127	60	33	5	2	100	4	—
1913–14	209	279	37	196	141	65	31	7	38	—	—	—	1,003	130	78	36	12	3	129	3	—
1914–15	197	271	34	205	146	61	25	16	46	57	—	—	1,057	157	66	44	10	3	123	5	—
1915–16	188	279	46	235	157	60	28	23	50	99	—	—	1,165	163	59	48	14	4	125	4	—
1916–17	172	270	55	233	173	31	38	26	42	139	—	—	1,179	142	60	61	11	9	144	4	—
1917–18	160	210	40	186	164	21	40	—	37	119	6	—	983	80	45	37	10	3	95	1	1
1918–19	111	172	40	135	155	9	75	6	16	67	81	—	867	27	33	49	6	1	116	—	1
1919–20	255	472	103	305	381	24	66	18	74	375	2	33	2,108	119	66	56	15	15	152	—	1

*First year students do not elect their courses until after this report is prepared.
†Only second and third year students in 1915-16.

STUDENTS AT THE END OF THE SCHOOL YEAR FOR THE PAST SEVEN YEARS

This table includes first year students

	1914	1915	1916	1917	1918	1919	1920
Engineering Courses							
Civil	263	251	234	225	212	240	310
Mechanical	365	329	337	340	270	400	573
Mining	58	49	56	67	63	78	133
Electrical	250	271	282	290	224	252	406
Chemical	205	192	200	267	258	350	428
Sanitary	90	78	69	40	22	16	26
Naval Architecture	52	49	62	74	83	78	96
Electrochemical	53	65	63	55	44	43	108
Engineering Administration	—	102	146	199	150	228	467
Aeronautical	—	—	—	—	—	2	2
General Engineering	—	—	—	—	—	—	29
Total Engineering	1,336	1,386	1,449	1,557	1,326	1,687	2,578
Architecture	160	183	173	163	74	67	144
Science Courses							
Chemistry	82	82	72	66	52	58	72
Biology	41	51	51	63	35	19	47
Physics	8	16	15	11	12	15	23
Geology	3	6	5	7	3	4	14
Total Science Courses	134	155	143	147	102	96	156
General Science	5	5	4	5	2	2	—
Special and No Course Classification	10	18	17	20	130	8	6
Grand Total	1,645	1,747	1,786	1,892	1,634	1,860	2,884

NUMBER OF STUDENTS IN EACH YEAR, FROM 1909, COMING FROM EACH STATE OR TERRITORY

States and Territories	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
North Atlantic:	1,126	1,118	1,152	1,212	1,279	1,394	1,434	1,502	1,316	1,436	2,261
Connecticut	32	33	45	44	45	55	61	69	49	59	101
Maine	20	24	25	24	25	32	23	32	26	34	58
Massachusetts	852	840	860	890	954	1,032	1,060	1,110	1,005	1,020	1,517
New Hampshire	27	27	29	28	34	34	27	30	26	28	48
New Jersey	14	18	33	34	38	48	54	53	47	58	113
New York	99	106	90	108	102	113	121	122	101	140	264
Pennsylvania	46	37	39	43	42	42	46	57	31	58	113
Rhode Island	30	27	25	33	34	31	35	17	19	26	42
Vermont	6	6	6	8	5	7	7	12	12	11	15
South Atlantic:	44	41	49	45	66	66	72	81	43	50	129
Delaware	1	1	1	2	2	3	5	4	7	3	14
District of Columbia	8	5	13	12	21	18	19	27	10	14	37
Florida	5	1	2	3	5	2	5	7	1	6	10
Georgia	4	5	3	3	4	3	5	5	3	2	8
Maryland	12	14	8	8	16	18	13	9	4	7	13
North Carolina	—	—	1	2	4	2	4	5	4	2	9
South Carolina	2	1	3	—	5	6	9	9	4	3	5
Virginia	10	12	15	13	8	11	8	8	6	9	24
West Virginia	2	3	3	2	1	3	4	7	4	4	9
South Central:	37	37	48	46	43	50	54	49	42	41	79
Alabama	5	4	6	3	5	5	5	5	6	5	12
Arkansas	2	2	2	2	1	2	1	1	—	—	1
Kentucky	4	2	8	7	10	10	8	9	6	5	14
Louisiana	2	5	4	4	5	5	7	7	5	5	10
Mississippi	3	6	8	7	5	6	5	2	4	2	6
Tennessee	8	5	3	2	2	5	5	8	3	3	10
Texas	13	13	17	21	15	17	23	17	18	21	26
North Central:	123	140	141	137	115	115	152	146	124	118	271
Illinois	24	33	30	25	15	27	37	31	27	19	49
Indiana	11	10	9	10	9	7	12	5	9	10	18
Iowa	5	4	9	8	11	10	12	6	1	5	15
Kansas	6	9	7	8	3	4	2	3	1	3	7
Michigan	10	9	9	7	12	14	15	16	14	19	26
Minnesota	10	8	7	14	15	6	5	6	4	5	18
Missouri	7	13	12	13	3	5	10	18	15	14	37
Nebraska	4	6	8	8	8	5	5	5	3	1	4
North Dakota	3	3	3	3	2	3	3	1	—	—	2
Ohio	27	33	37	32	25	28	44	43	42	34	68
South Dakota	5	3	2	2	2	1	3	1	1	—	2
Wisconsin	11	9	8	7	10	5	4	11	7	8	25
Western:	59	53	57	65	63	72	59	52	46	42	120
Alaska	—	—	—	1	1	—	—	—	1	—	—
Arizona	—	1	1	1	—	—	—	1	—	1	2
California	25	21	23	22	23	30	25	22	16	14	41
Colorado	6	9	11	14	13	14	11	8	7	7	26
Idaho	—	—	—	—	1	2	1	2	1	—	1
Montana	3	2	2	4	4	3	2	1	3	6	8
Nevada	—	—	—	—	—	—	—	—	—	—	1
New Mexico	1	—	—	1	1	1	1	—	—	—	4
Oklahoma	—	—	—	1	2	—	—	1	—	2	3
Oregon	7	8	11	14	11	10	5	6	6	7	9
Utah	5	3	3	2	2	—	5	5	5	—	5
Washington	11	9	6	6	5	10	7	4	4	5	15
Wyoming	1	—	—	—	—	—	2	2	3	—	5

	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
Districts	11	15	11	6	6	5	4	5	4	5	13
Canal Zone	1	1	—	—	—	—	—	—	—	1	1
Hawaii	2	2	3	2	1	2	1	—	1	1	—
Philippine Islands	1	4	3	1	2	1	1	2	—	—	7
Porto Rico	7	8	5	3	3	2	2	3	3	3	5
Total for the United States	1,400	1,404	1,458	1,511	1,572	1,702	1,775	1,835	1,575	1,692	2,873

NUMBER OF STUDENTS IN EACH YEAR, FROM 1909, COMING FROM EACH FOREIGN COUNTRY

	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919
Foreign Countries	79	102	101	100	113	114	125	122	123	127	205
Albania	—	—	—	—	—	—	—	—	1	—	—
Argentine Republic	4	5	2	1	—	—	1	1	1	—	3
Armenia	—	—	—	—	—	—	—	—	—	2	3
Australia	—	—	1	—	—	—	—	—	—	—	2
Austria-Hungary	—	2	1	2	1	2	1	1	1	—	—
Brazil	1	2	3	5	7	4	1	1	4	2	4
Bulgaria	1	—	—	—	—	—	1	—	—	—	—
Canada	20	18	19	13	14	15	14	16	10	10	38
Cape Colony	—	—	1	—	—	1	—	—	—	—	—
Chile	1	3	1	—	1	—	—	8	10	6	7
China	11	27	36	37	42	46	49	40	42	38	40
Colombia	—	—	—	—	1	3	4	3	2	4	6
Costa Rica	2	1	1	—	1	—	—	1	1	1	1
Cuba	7	5	3	6	7	3	2	8	6	5	4
Cyprus, Island of	—	—	—	—	—	—	1	—	—	—	—
Denmark	—	1	1	—	2	1	1	1	3	1	1
Ecuador	1	1	1	1	1	—	—	1	1	4	2
Egypt	1	1	2	1	1	1	1	1	1	—	1
England	—	1	1	—	—	1	1	1	—	—	1
Finland	—	1	—	—	—	—	—	—	—	—	—
France	—	2	2	3	4	2	—	—	—	—	2
Germany	1	1	2	3	2	2	3	1	—	—	—
Greece	—	—	1	1	1	1	—	—	2	3	2
Guatemala	—	1	—	1	1	2	1	—	1	—	—
Honduras	3	3	2	—	1	1	2	3	3	—	1
India	1	—	—	2	1	2	2	1	—	—	2
Ireland	—	—	—	—	—	—	—	—	—	—	1
Italy	1	1	—	—	—	—	1	2	—	—	1
Jamaica	1	1	1	—	—	—	—	—	—	—	—
Japan	4	4	3	—	1	1	6	8	11	15	10
Korea	—	—	—	2	—	—	—	—	—	—	—
Mexico	10	9	5	4	7	7	10	9	5	5	9
Newfoundland	—	—	1	1	1	—	—	—	—	—	—
New Zealand	1	1	2	1	—	—	—	—	—	—	—
Nicaragua	—	—	—	—	—	—	2	—	—	—	—
Norway	—	1	—	—	—	—	2	3	6	12	38
Paraguay	1	1	1	1	1	1	—	—	—	—	—
Peru	1	2	1	—	2	3	3	—	2	—	3
Portugal	—	1	—	—	1	—	1	—	—	—	—
Russia	2	2	3	4	4	5	2	2	1	10	8
Salvador	—	1	—	1	1	1	3	1	—	—	—
Scotland	—	—	—	—	1	1	—	—	—	—	1
Siam	—	—	—	—	—	—	1	1	—	—	5
South African Republic	—	—	—	1	1	—	1	—	—	1	2
Spain	—	—	—	—	—	—	—	—	2	4	2
Straits Settlements	—	—	—	—	—	—	—	—	—	1	—
Sweden	—	—	—	—	—	—	—	—	2	—	—
Switzerland	1	1	1	—	—	—	—	—	—	—	1
Syria	—	1	2	3	2	2	—	1	—	—	—
Transvaal	1	2	—	—	—	—	—	—	—	—	—
Turkey	2	2	1	5	3	6	8	6	5	1	1
Uruguay	—	—	—	—	—	—	—	—	5	2	3
Total in School	1,471	1,506	1,559	1,611	1,685	1,816	1,900	1,957	1,698	1,819	3,078

Women Students, 1919–1920

Year	COURSE								
	Mining Engineering	Architecture	Chemistry	Biology and Public Health	General Science	Chemical Engineering	Electrochemical Engineering	Engineering Administration	Total
First	—	—	—	—	—	—	—	—	8
Second	—	5	—	1	—	—	1	1	8
Third	1	3	1	2	—	—	—	—	7
Fourth	—	4	—	1	1	1	1	—	8
Graduate	—	1	1	7	—	—	—	—	9
Total	1	13	2	11	1	1	2	1	40

Total Registration and Number of New Students, 1919-1920

Year	(1) Total Number of Students	(2) Number of Students in the Catalogue of the previous year who remain in the Institute	(3) Number of New Students entering before issue of Catalogue	(4) Of those in column (3) the following number are classified First-Year Students	(5) Number of New Students not of the regular First-Year Class
1903–1904	1,528	1,042	486	249	237
1904–1905	1,561	986	575	295	280
1905–1906	1,466	984	482	213	269
1906–1907	1,397	862	535	272	263
1907–1908	1,415	888	527	273	254
1908–1909	1,462	868	594	323	271
1909–1910	1,479	890	579	317	262
1910–1911	1,506	944	562	283	279
1911–1912	1,559	932	627	312	315
1912–1913	1,611	984	627	310	317
1913–1914	1,685	1,049	636	295	341
1914–1915	1,816	1,084	727	348	379
1915–1916	1,900	1,146	754	321	433
1916–1917	1,957	1,165	792	369	423
1917–1918	1,698	1,005	693	385	308
1918–1919	1,819	654	1,165	765	400
1919–1920	3,078	1,204	1,874	552	1,322

GRADUATE STUDENTS, 1919–1920

American Colleges and Universities Represented

	1914–15	1915–16	1916–17	1917–18	1918–19	1919–20
Akron	—	—	—	3	—	1
Alabama	2	1	2	2	—	—
Alabama Polytechnic Inst.	—	1	2	1	—	2
Albany Medical	—	1	—	—	—	—
Alfred	—	—	—	1	—	1
Allegheny	1	—	—	1	—	1
Amherst	8	6	10	3	1	5
Arizona	—	—	—	1	—	2
Armour Institute of Tech.	—	—	2	1	—	—
Assumption	—	—	—	—	—	1
Austin	—	—	—	—	—	1
Baker	—	—	—	—	—	2
Baltimore Medical	1	—	—	—	—	—
Bates	3	—	4	3	—	2
Baylor	2	1	1	—	—	—
Bellevue	1	—	1	—	—	—
Bellevue Hospital, Medical	—	1	—	—	—	—
Beloit	2	1	2	2	—	1
Bethany	—	—	—	1	—	—
Boston College	2	—	3	1	1	6
Boston University	—	1	4	2	1	2
Bowdoin	2	—	4	—	1	3
Brooklyn Polytechnic Inst.	—	—	2	1	—	1
Brown	2	1	2	2	—	3
Bryn Mawr	—	—	—	—	—	4
Bucknell	—	—	—	—	—	2
Buffalo	—	—	—	1	—	1
California	2	3	7	4	—	1
Campion	—	—	—	—	—	2
Canisius	—	—	1	—	1	1
Carleton	—	—	—	—	—	1
Carnegie Institute of Technology	1	—	1	1	—	1
Case School of App. Science	1	—	6	1	—	—
Catholic University of Am.	1	—	5	3	1	—
Centre	—	—	—	—	—	1
Charleston	1	2	1	—	—	—
Chicago	1	—	1	1	—	1
Cincinnati	1	1	1	1	1	1
City of New York	2	2	3	7	—	5
Clark	3	2	1	1	2	3
Clarkson	—	—	—	—	—	1
Clemson Agricultural	1	—	—	—	—	—
Colby	1	1	3	2	—	2
Colgate	1	2	2	3	1	—
Colorado Agricultural	—	1	1	—	—	—
Colorado College	1	1	1	—	—	—
Colorado School of Mines	2	—	1	1	—	—
Colorado University	1	—	1	1	—	3
Columbia	3	4	6	3	4	4
Cooper Union	—	—	1	—	—	—
Cornell University	1	2	9	8	5	4
Cornell (Iowa)	—	1	—	1	—	—
Cotner	—	—	1	—	—	—
Creighton	1	1	—	—	—	—
Dakota Wesleyan	—	1	—	—	—	—
Dartmouth	7	4	22	15	1	11
Davidson	—	—	—	1	1	1
Davis and Elkins	—	—	1	1	—	—
Delaware	—	—	—	1	—	3
Denison	2	4	2	2	—	—
Denver	—	—	2	1	—	—
Doane	1	—	—	—	—	—
Drake	—	—	1	—	—	1
Drury	—	—	2	—	—	—

	1914–15	1915–16	1916–17	1917–18	1918–19	1919–20
Earlham	1	—	—	—	—	—
Fargo	—	—	1	—	—	—
Fordham	—	—	—	—	—	1
Franklin and Marshall	—	—	1	—	—	2
Furman	1	1	—	1	—	—
Geneva	—	—	1	—	—	—
Georgetown	1	1	2	1	—	—
George Washington	—	—	—	1	—	1
Georgia	—	1	1	—	—	1
Georgia School of Tech.	1	1	4	2	—	1
Gonzaga	2	2	1	—	—	—
Goucher	—	—	—	—	1	—
Grinnell	—	2	2	—	—	2
Hamilton	3	3	4	2	—	3
Harvard	23	44	46	27	4	21
Haverford	—	—	3	—	—	1
Hobart	—	1	1	—	—	2
Holy Cross	1	1	1	3	—	3
Hospital College of Medicine	1	—	—	—	—	—
Illinois	2	3	5	4	1	1
Indiana Medical College	—	—	—	1	—	—
Indiana University	—	—	—	—	—	1
Iowa State	—	1	2	—	1	1
Jefferson Medical	1	—	—	—	—	—
John B. Stetson	—	—	2	—	—	—
Johns Hopkins	1	2	1	—	—	1
Juniata	1	—	—	—	—	—
Kalamazoo	—	—	2	2	—	1
Kansas	—	1	2	4	—	3
Kentucky	1	1	1	1	1	1
Kenyon	1	—	—	—	—	—
Lafayette	2	—	1	—	—	—
Lake Forest	—	1	1	2	—	—
Lawrence	—	—	1	1	—	1
Lehigh	—	—	4	5	—	—
Leland Stanford Junior	1	1	2	1	—	2
Lewis Institute	—	—	—	—	—	1
Lincoln	—	—	1	—	—	—
Lombard	—	1	1	1	—	—
Louisiana State	—	—	1	1	—	1
Louisville	—	—	1	—	—	—
Loyola	1	1	1	1	—	1
McMaster University	—	—	—	1	—	—
Maine	—	3	7	2	1	1
Manhattan	—	—	—	1	1	1
Marietta	1	1	—	—	—	—
Marion Institute	—	—	—	—	—	1
Maryville	—	1	1	1	—	—
Massachusetts Agricultural	1	1	6	3	—	2
Mass. Institute of Tech.	32	3	16	14	8	16
Mercer	—	—	—	1	—	—
Miami	1	2	2	3	—	—
Michigan	3	4	4	2	2	3
Michigan Agricultural	1	1	—	—	—	1
Michigan College of Mines	—	1	1	—	1	—
Middlebury	2	1	2	—	1	1
Millsaps	—	—	—	1	—	—
Minnesota	1	2	3	2	1	1
Mississippi	—	—	—	1	—	2
Mississippi Agricultural and Mechanical	3	3	2	—	—	—
Missouri	—	1	3	2	—	1
Monmouth	—	1	1	—	—	—
Montana	—	—	—	1	—	—
Montana School of Mines	—	—	—	1	—	—

GRADUATE STUDENTS, 1919-1920—*Continued*

American Colleges and Universities Represented

	1914–15	1915–16	1916–17	1917–18	1918–19	1919–20
Moore's Hill	—	1	1	1	—	—
Mount Holyoke	2	—	1	—	1	1
National Univ. Law School	—	1	—	—	—	—
Nebraska	—	—	1	1	—	2
Newberry	—	—	1	—	—	—
NewHampshire Agricultural and Mechanical	—	—	1	1	—	—
New Mexico	1	—	—	—	—	—
New York University	1	—	2	1	—	—
North Carolina	—	2	6	4	—	3
North Dakota Agricultural	—	—	—	—	—	1
Northwestern	1	—	3	1	—	2
Norwich	—	—	4	1	—	—
Notre Dame	—	—	2	4	1	—
Oberlin	1	2	5	—	—	1
Occidental	—	1	1	2	—	—
Ogden	1	2	1	—	—	—
Ohio Northern	1	—	—	—	—	—
Ohio State	—	2	2	—	—	1
Ohio University	—	2	1	—	—	—
Ohio Wesleyan	1	1	1	1	—	1
Oklahoma Agr. and Mech.	—	—	1	—	1	—
Oregon	1	1	—	1	1	3
Oregon Agricultural	1	1	1	3	2	3
Park	1	—	—	—	—	—
Pennsylvania (Gettysburg)	—	1	2	—	—	—
Pennsylvania Military	1	—	—	—	—	—
Pennsylvania State	1	1	3	—	2	3
Pennsylvania University	3	2	10	5	—	4
Pittsburgh	1	1	—	1	1	—
Pomona	—	—	—	1	—	—
Princeton	6	6	9	4	2	4
Purdue	3	3	3	2	1	—
Radcliffe	—	2	4	4	7	1
Randolph-Macon	1	—	—	—	—	—
Reed	—	1	1	—	—	—
Rensselaer Polytechnic Inst.	—	—	3	1	1	—
Rhode Island State	—	1	1	1	—	—
Rice Institute	—	—	1	1	—	—
Rochester	1	3	7	4	—	—
Rose Polytechnic Institute	—	—	—	4	1	1
Rutgers	—	—	1	—	—	1
Rush Medical College	—	—	—	1	—	—
Saint Anne	—	—	1	—	—	—
St. Anselm	—	—	1	1	—	—
St. Elizabeth	—	—	—	—	—	1
Saint Francis Xavier	—	—	1	1	—	—
St. Joseph's (Philadelphia)	—	—	—	—	1	—
Saint Mary's	1	—	—	—	—	2
Saint Olaf	1	—	1	—	—	2
Simmons	—	—	—	—	1	—
Simpson	2	—	—	—	—	—
Smith	1	2	—	1	1	—
South Carolina	—	—	2	—	—	1
South Carolina Military	2	1	3	3	—	1
Southern California	1	—	—	—	—	—
Southwestern	1	—	—	—	1	—
Spring Hill	2	3	1	—	2	2
Stevens Institute of Tech.	1	—	—	3	1	—
Syracuse	3	1	2	1	—	—
Tennessee	2	2	1	1	—	—
Texas	4	2	3	4	1	1
Texas, Agr. & Mech. Coll. of	—	4	4	2	—	1
Throop	—	—	2	—	—	1
Trinity(Hartford, Conn.)	3	2	—	1	—	1
Trinity (Washington, D.C.)	—	2	2	1	—	—
Trinity(N. C.)	—	1	—	—	—	—
Tufts	3	1	14	7	—	3
Tulane	—	1	1	1	—	1
Union	1	1	2	3	—	—
U. S. Military Academy	—	—	3	1	—	5
U. S. Naval Academy	10	15	22	1	6	6
University of the South	—	—	1	—	—	—
Ursinus	1	1	1	—	—	—
Utah	—	—	2	3	—	1
Utah Agricultural	—	—	1	—	—	—
Valparaiso	1	—	1	1	—	—
Vanderbilt	—	—	1	1	1	1
Vermont	—	—	2	3	—	—
Virginia	5	4	3	3	—	5
Virginia Military	3	7	5	4	1	3
Virginia Polytechnic Inst.	—	1	—	—	—	1
Wabash	—	—	—	—	—	1
Washburn	1	1	3	—	—	2
Washington	1	—	6	2	—	1
Washington (St. Louis)	—	—	—	1	—	—
Washington and Jefferson	1	—	2	1	—	2
Washington and Lee	1	2	4	3	6	3
Washington State	—	—	1	—	—	1
Wellesley	—	1	—	2	2	1
Wesleyan	1	1	7	5	2	1
Western Reserve	1	—	1	1	—	—
West Virginia	—	1	—	—	—	—
Whitman	1	1	—	1	—	—
William Jewell	1	1	—	1	—	—
William and Mary	2	1	1	—	—	—
Williams	10	12	10	5	—	4
Wisconsin	1	2	4	4	1	—
Wittenberg	—	1	—	—	—	—
Wofford	—	—	1	—	1	—
Wooster	2	3	3	1	—	1
Worcester Polytechnic	—	—	9	11	2	—
Wyoming	—	1	2	4	—	—
Yale	19	25	21	10	1	13

NUMBER OF COLLEGES

American	119
Foreign	64
Total	183

NUMBER OF GRADUATE STUDENTS

Candidates for Advanced Degrees	91
Pursuing Undergraduate Work	263
Total	354

New Students from Other Colleges by Years, 1919-1920

Class Joined at Institute	Years Spent at College				Total
	One	Two	Three	Four, or more	
First year	42	17	4	9	72
Second year	82	76	17	43	218
Third year	4	54	37	57	152
Fourth year	6	3	4	36	49
Graduate year	—	—	3	40	43
Total	134	150	65	185	534

College Students among the Courses, 1919-1920

Graduates and Students from Colleges. 20% of the Total Student Body	First Year	Civil Engineering	Mechanical Engineering	Mining Engineering	Architecture	Chemistry	Electrical Engineering	Biology and Public Health	Physics	General Engineering	Chemical Engineering	Sanitary Engineering	Geology	Naval Architecture	Electrochemical Eng.	Engineering Administration	Aeronautical Engineering	Mathematics	Total
Graduates	25	37	53	12	15	30	45	25	—	1	45	3	5	12	14	29	2	1	354
Non-graduates	105	62	119	35	43	15	86	8	1	11	90	5	4	29	15	102	—	—	730
Total	130	99	172	47	58	45	131	33	1	12	135	8	9	41	29	131	2	1	1,084

Ages of Classified First Year Students, October, 1919

Under 17	19	19½ to 20	41
17 to 17½	49	20 to 20½	44
17½ to 18	68	20½ to 21	24
18 to 18½	86	21 to 22	30
18½ to 19	62	22 to 23	23
19 to 19½	66	23 to 24	21
Over twenty-four	19		533

Average age of Classified Students, omitting those over 24, 19 years 3 months.

Statistics of the Summer School

	1919	1920
Total number of students	891	1233
Number of Institute students enrolled	496	626
Number not previously connected with the Institute	395	607
Registrations to make up failures or deficiencies	399	691
Registrations to anticipate work	1382	2508
Registrations at Summer Surveying Camp	85	138
Summer School students who did not register for the school year following	72	180

Graduates by Years and Courses

Year	Civil Engineering	Mechanical Engineering	Mining Eng. and Metallurgy	Architecture	Chemistry	Electrical Engineering	Natural History or Biology	Physics	General Course	Chemical Engineering	Sanitary Engineering	Geology	Naval Architecture	Electrochemical Engineering	Engineering Administration	Total	Total by Decades
1868	6	1	6	—	—	—	—	—	1	—	—	—	—	—	—	14	
1869	2	2	—	—	1	—	—	—	—	—	—	—	—	—	—	5	
1870	4	2	2	—	1	—	—	—	1	—	—	—	—	—	—	10	29
1871	8	2	5	—	2	—	—	—	—	—	—	—	—	—	—	17	
1872	3	1	5	—	3	—	—	—	—	—	—	—	—	—	—	12	
1873	12	2	3	1	7	—	—	—	1	—	—	—	—	—	—	26	
1874	10	4	1	1	—	—	—	—	2	—	—	—	—	—	—	18	
1875	10	7	6	1	1	—	—	1	2	—	—	—	—	—	—	28	
1876	12	8	8	—	5	—	2	3	4	—	—	—	—	—	—	42	
1877	12	6	8	4	2	—	—	—	—	—	—	—	—	—	—	32	
1878	8	2	2	3	3	—	—	—	1	—	—	—	—	—	—	19	
1879	6	8	3	1	3	—	1	1	—	—	—	—	—	—	—	23	
1880	3	—	3	—	1	—	—	—	1	—	—	—	—	—	—	8	225
1881	3	5	6	3	8	—	1	—	2	—	—	—	—	—	—	28	
1882	2	5	5	3	6	—	1	1	1	—	—	—	—	—	—	24	
1883	3	7	5	1	3	—	—	—	—	—	—	—	—	—	—	19	
1884	5	6	13	—	12	—	—	—	—	—	—	—	—	—	—	36	
1885	4	7	8	2	4	2	—	—	1	—	—	—	—	—	—	28	
1886	9	23	7	1	7	10	1	—	1	—	—	—	—	—	—	59	
1887	10	17	8	1	9	8	1	1	3	—	—	—	—	—	—	58	
1888	11	25	4	5	10	17	3	1	1	—	—	—	—	—	—	77	
1889	14	24	5	3	8	17	1	1	2	—	—	—	—	—	—	75	
1890	25	28	3	5	13	18	3	2	6	—	—	—	—	—	—	103	507
1891	18	26	4	6	11	23	3	3	1	7	—	1	—	—	—	103	
1892	22	26	4	13	7	36	6	1	7	4	6	1	—	—	—	133	
1893	25	30	5	2	8	41	2	—	6	8	—	2	—	—	—	129	
1894	21	31	4	14	11	33	1	3	5	12	3	—	—	—	—	138	
1895	25	30	3	15	14	33	—	2	4	11	4	—	5	—	—	144*	
1896	26	34	10	24	17	48	3	3	7	7	4	3	5	—	—	190*	
1897	25	40	7	16	20	33	2	3	7	12	4	1	9	—	—	179	
1898	32	41	7	29	25	33	3	4	6	9	3	—	7	—	—	199	
1899	30	37	9	22	22	32	2	2	1	10	1	—	8	—	—	173*	
1900	32	34	21	21	19	23	3	3	5	11	4	—	9	—	—	185	1,573
1901	37	39	18	21	17	25	1	1	6	14	4	1	16	—	—	200	
1902	24	46	14	18	14	35	5	3	3	9	7	—	14	—	—	192	
1903	26	37	27	15	13	39	1	3	1	10	4	1	12	1†	—	190	
1904	34	45	32	24	15	34	3	5	5	7	2	1	17	8†	—	232	
1905	46	54	26	12	23	31	3	—	3	13	5	1	24	3†	—	244	
1906	47	69	38	22	21	37	2	4	—	10	6	—	19	3†	—	278	
1907	37	52	22	21	10	32	—	—	—	14	3	2	10	5†	—	208	
1908	48	61	19	19	16	38	4	—	—	15	2	—	5	2†	—	229	
1909	51	41	30	18	12	42	5	3	—	13	9	—	5	3	—	232	
1910	57	57	24	18	10	36	3	—	2	18	12	—	11	3	—	251	2,256
1911	46	49	17	10	12	49	1	1	2	19	15	—	6	5	—	231*	
1912	55	47	21	21	7	52	4	2	1	31	14	—	3	3	—	260*	
1913	58	50	20	26	12	43	2	1	—	30	15	—	4	8	—	269	
1914	60	65	17	19	9	51	6	1	4	37	19	—	8	8	—	301*	
1915	49	69	5	30	23	42	3	3	2	33	12	—	7	10	—	286*	
1916	45	84	5	37	11	56	5	3	2	32	18	—	9‡	14	—	318*	
1917	48	63	14	27	12	45	10	1	5	43	17	2	9‡	10	37	341*	
1918	45	70	10	28	10	47	6	3	3	37	5	1	4	11	26	305*	
1919	42	54	7	14	7	46	8	3	1	42	6	—	7	4	22	261*	
1920	41	44	10	11	6	28	1	—	2	53	2	—	10	8	32	248	2820
Totals	1,329	1,623	564	602	523	1,210	112	71	121	571	206	17	243	109	117	7,410*	

Names counted twice, students graduating in two different years	25
Bachelors of Science	7,385*
Masters of Science	413
Doctors of Philosophy, of Engineering, and of Science	48
Total	7,651*

*Deducting names counted twice (students graduating in two courses) or receiving an advanced degree in addition to an S. B.

†Prior to 1909 this Course was designated as Option 3 (Electrochemistry) of Course VIII.

‡Two received the degree in XIIIB in 1916 and three in 1917.

DOCTOR OF PHILOSOPHY

Year	Biology	Chemistry	Geology	Physics	Physical Chemistry	Total
1907	—	—	—	—	3	3
1908	—	1	—	—	2	3
1909	—	—	—	—	—	—
1910	—	—	1	—	1	2
1911	1	—	—	—	—	1
1912	—	3	3	—	—	6
1913	—	1	—	—	—	1
1914	—	2	—	—	—	2
1915	—	2	—	—	—	2
1916	—	1	1	1	—	3
1917	—	3	1	—	—	4
1918	—	3	1	—	—	4
1919	—	—	—	1	—	1
1920	—	4	1	—	—	5
Total	1	20	8	2	6	37

DOCTOR OF ENGINEERING (*Discontinued after 1918*)

Year	Aeronautical Engineering	Electrical Engineering	Electrochemical Engineering	Total
1910	—	1	—	1
1911	—	1	—	1
1912	—	—	—	—
1913	—	—	—	—
1914	—	1	—	1
1915	—	1	—	1
1916	1	1	—	2
1917	—	1	1	2
1918	—	—	—	—
Total	1	6	1	8

DOCTOR OF SCIENCE

Year	Aeronautical Engineering	Geology	Mining Engineering	Total
1920	1	1	1	3

Master of Science	Civil Engineering	Mechanical Engineering	Mining Engineering	Architecture	Chemistry	Electrical Engineering	Biology and Pub. Health	Physics	General Science	Chemical Engineering	Sanitary Engineering	Geology	Naval Architecture	Naval Constr'n, U. S. N.	Naval Construction, Foreign Students	Electrochemical Eng.	Aeronautical Engineering	Mathematics	No Course	Total
1886	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1887	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1888	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1889	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1890	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1
1891	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1892	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1893	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1894	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1895	—	—	—	1	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	3
1896	—	—	—	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
1897	—	—	—	2	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	4
1898	—	1	—	1	—	—	—	1	—	2	—	—	—	—	—	—	—	—	—	5
1899	—	—	—	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	3
1900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1901	—	2	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
1902	—	2	—	3	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8
1903	—	1	—	5	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	7
1904	—	1	—	4	1	2	—	1	—	—	—	—	—	3	—	—	—	—	—	12
1905	—	—	—	9	—	—	—	—	—	—	1	—	—	8	—	—	—	—	—	18
1906	—	—	—	3	1	—	—	—	—	—	—	—	2	3	—	—	—	—	—	9
1907	—	—	—	6	—	—	—	—	—	1	—	—	—	8	—	—	—	—	—	15
1908	—	—	—	1	1	3	—	—	—	—	—	—	—	7	—	—	—	—	—	12
1909	2	1	2	6	1	1	—	1	—	1	—	1	—	3	—	—	—	—	—	19
1910	2	1	—	6	1	1	1	—	—	—	—	—	—	7	—	—	—	—	—	19
1911	2	2	—	5	2	4	2	—	—	—	—	—	—	3	—	—	—	—	—	20
1912	3	—	2	4	3	2	2	—	—	—	2	—	—	4	—	—	—	—	—	22
1913	1	2	1	4	—	1	1	—	—	7	—	1	—	2	—	—	—	—	—	20
1914	3	1	—	3	5	2	2	—	—	3	3	1	—	2	—	—	—	—	—	25
1915	1	4	1	4	2	10	—	—	—	2	—	—	1	2	—	1	1	—	—	29
1916	5	4	—	7	3	6	1	—	—	1	1	—	—	2	5	1	5	—	—	41
1917	3	1	1	3	1	5	—	1	—	1	2	—	—	9	—	—	4	—	—	31
1918	1	2	1	1	1	2	1	—	—	1	—	—	—	—	—	—	5	—	1	16
1919	4	1	—	—	3	4	—	—	—	—	—	—	—	—	—	1	2	1	—	16
1920	3	5	1	—	2	3	1	1	—	3	—	3	—	19	—	1	—	1	4	47
Total	31	31	9	84	35	46	12	7	1	23	10	6	3	82	5	4	17	2	5	413

REPORT ON SUMMER COURSES

Summer Courses originated at the Institute as undertakings by members of the instructing staff to give review instruction to students who had failed in certain subjects. Summer Courses today are an integral part of the work of the Institute.

For the past summer, the work given was as follows: Five required courses for Institute students: a first-year class (Junior Grade), a class of Course VIA, two courses for Army Engineer Officers, a course for Army Ordnance Officers, eighty Elective Courses, and the Summer Camp. The total attendance was about fifteen hundred — a student body as large as the Institute enrollment a short time before removal to the new site.

Moreover, the change in character of the Summer Courses has been accompanied by a change in the kind of students taking them. College men and our own good students who anticipate the work of the regular term during the summer months, today far outnumber the repeaters, the former type of summer school students.

The receipts from tuition fees for the past Summer School were $68,725. The output in salaries including the required courses and the Summer Camp was $50,054.

It is a false economy that allows a large money investment in buildings and laboratories to be unproductive during one-fourth of the year. That a summer session of regular Institute grade, with a strong faculty, fills a need is justified by the large and increasing attendance.

School the year round has become an achieved ideal at some institutions. Several successful summer sessions under a changed plan have amply proved that there is sufficient demand for a revised program of summer work, and careful study is being made of the summer session for future years.

CHARLES F. PARK, *Chairman.*

SOCIETY OF ARTS

When our late President, Dr. Maclaurin, discussed the policy of the Society in January, 1917, with the new Secretary, he believed it desirable to reorganize the Society and follow a new policy in regard to its lectures. He spoke of the need and the value of the lectures originally given, but said that on account of the development of popular science magazines and the great increase in the number of lectures available for grown-ups, there is not at present the same need or demand for that type of lecture originally held by the Society. He then spoke of the juvenile Christmas lectures held in London and remarked that he had failed to note any special science lectures for children, particularly in the fields of science taught here at Technology. It was his belief that the resources of the Institute might become more available for the pupils of the high and preparatory school age. To discuss this question of organizing juvenile lectures, he invited the Superintendents of Schools, the Principals and Teachers of the High and Preparatory Schools of Boston and its vicinity to meet him here at Technology. He presented his proposition and asked for suggestions concerning topics and the best time for lectures. He outlined the plan for making the resources of the Institute available for these lectures that might be given by members of the Institute's Staff or by lecturers from the schools in or about Boston, and he further stated that the lecturers were to receive compensation. The plan from the start was received with enthusiasm and has continued to receive the interest and attention of the preparatory schools here and about.

During the past year, another series of four lectures has been held and the attendance has been at least as good as during the past three years. As usual, just prior to the opening of the season, notices in regard to them were sent to the preparatory schools requesting that applications be made for tickets. The demand has always been in excess of the supply, hence the number sent to the various schools has always had to be limited. The attendance of pupils from many schools has been perfect and the attendance in general has been excellent.

In March, Professor D. L. Webster of the Department of Physics gave an experimental lecture on X-rays divided into three parts: 1. How X-rays act under ordinary conditions; 2. What X-rays are as shown by special experiments; and 3. How we get X-rays.

In April, Professor W. S. Franklin, also of the Department of Physics, gave a talk entitled "Some Experiments in Heat." These experiments were selected with reference to practical applications. They illustrated the expansion of solids and gases, heating by compression and cooling by expansion, conduction of heat, evaporation and boiling, melting and freezing.

In May, Professor James F. Norris of the Department of Chemistry, gave a lecture upon "Some Chemical Discoveries and Inventions." He performed many experiments and showed the relation between these experiments and inventions derived from them. Among the numerous experiments was the development of Carbon Dioxide and its effect upon the candle flame and hence the invention of fire extinguishers using carbon dioxide.

The last lecture of the season, in May, was given by Professor Charles L. Norton and was called "Sounds and Noises." After showing an immense model of the ear he discussed the origin of sound and performed experiments to illustrate. He spoke on the transmission of sound and the different kinds of sound and noises. Experiments upon reflection and resonance were performed leading to a discussion of Architectural Acoustics. Sound waves were analyzed by means of a reflected beam of light and a revolving mirror. It gave the children present a remarkably clear graphical representation of the sound wave. Certain musical instruments were shown and their special sound qualities discussed.

According to the present plan lectures have been held in February, March, April and May. It might be well that a trial be made of holding the lectures earlier in the school year; for they are open to pupils who have not, as well as to those who have, studied science and the interest provoked by attendance at these lectures early in the year might lead some pupils sooner to elect science courses in their schools.

WALTER HUMPHREYS,
Secretary.

DEPARTMENT OF CIVIL AND SANITARY ENGINEERING

During the past year the work of the department was again carried on under unusual conditions, the senior class being much smaller than normal while the junior and sophomore classes were exceptionally large. This situation made it possible to conduct the work with a smaller permanent staff than usual. For the coming year the third and fourth year classes will both be of exceptional size, and while the instructing force has been augmented by several additional instructors and assistants, the burden falling upon the faculty members will be great. It is hoped that if the present attendance at the Institute is to continue, it will be possible to add to the teaching corps of the department several professors of high professional standing.

An important event of the year was the decision of the United States War Department to send to the Institute for training in civil engineering, a considerable group — thirty-seven in number — of officers from the Engineer Corps of the Army. Some of these men began their work during the summer, and others arrived in time to enter our classes at the beginning of the fall term. These officers are candidates for the bachelor's degree and attend the regular classes, thus mingling with civilian students, with many of whom they will come into contact in the future pursuit of their professional duties. As these officers are selected for their ability, it is believed that their addition to the student personnel department will have an excellent effect.

Mr. H. L. Bowman has been promoted to the grade of assistant professor. Mr. Bowman was appointed an instructor for the year 1919-1920, after having had considerable experience in structural engineering, as well as experience an as instructor at Purdue University.

The ninth session of the Summer Surveying Camp was held during the summer from August 2 to September 24, inclusive. The attendance consisted of 138 students; of these, 128 were from Courses I, III, XI, XII and XV, Option 1, in which attendance is required, the remainder coming from miscellaneous courses at the Institute and from other institutions.

On account of the large number of students attending the camp this year, it was necessary to build, during the early summer, an extension to the main group of buildings. This extension consists of an additional building in the rear of the main group. It contains a new instrument room and office space for nineteen members of the instructing staff.

The session was marred by the first fatality that has occurred at one of our surveying camps. On Sunday afternoon, August 29, Albert S. McAuliffe, a student in Course I, and a son of John McAuliffe of Haverhill, Mass., while swimming off the dock with a companion, in about seven feet of water, disappeared suddenly without outcry or struggle. His body was recovered in less than five minutes and the Schaefer method of resuscitation immediately applied, followed by the use of the camp pulmotor for three and one-half hours under the direction of the resident physician and local physicians who were called to the camp. The medical examiner and three attending physicians agreed that the primary cause of his death was heart failure. The camp exercises were suspended on August 30 and the body accompanied to his home by an escort of four students.

The cost per student for meals and miscellaneous expenses necessary for the operation of the camp was $1.46 per day as compared with $1.47 per day in 1919. The total charge for these items for the camp session was $77.38 per man.

The class in Underground Surveying was held at the Pike Hill Mines, Corinth, Vermont, arrangements for its use being made through the courtesy of John H. Allen, M. I. T. '81, to whom, as well as to Wendell H. Marden, Treasurer of the Mines, the thanks of the department are due.

The demand for graduates of the department during the year was extremely pressing, applications from employers being far in excess of the available supply; the requests for graduates in Sanitary Engineering were especially urgent.

Gifts to the department during the year consist of surveying instruments from the estate of F. L. Fuller, M. I T. '71, and from B. F. Smith and Company boring tools used in underground exploration.

The thanks of the department are due to the Holyoke Water Power Company for the use of the Holyoke testing flume by the

graduate class in Water Power Engineering, and to the Proprietors of Locks and Canals at Lowell for permission to occupy their stream gaging station. Further courtesies have been received by the Department from companies and associations engaged in the production of material used in highway construction, consisting in several cases of furnishing, without charge, lecturers to present special phases of highway construction to the class in Roads and Pavements.

CHARLES M. SPOFFORD.

DEPARTMENT OF MECHANICAL ENGINEERING

During the past year the staff of the Department has carried an unusually heavy load.

This resulted first from the increase in the registration in the second, third and fourth year classes and second, because the vacancies caused by withdrawals from the staff could not be filled, as but few of the men available were willing to teach at salaries lower than those paid by the industries.

The total student hours given by the Department during the year was over 500,000, making an average of about 14,700 student hours per man.

During the summer of 1919 preparations were made for the care of the large classes expected in the fall. In the Engineering Laboratories a number of new pieces of apparatus were installed and some of the old equipment which had not been put in shape for use was made ready for classes. This laboratory had classes totaling 500 men per week, each man working two hours in one period. Student assistants chosen from the senior class were hired to teach in the third year laboratory work; their work was in every way satisfactory.

The Machine Tool Laboratory on the third floor was enlarged fully one hundred per cent, the Department having been particularly fortunate in having had a chance to select the new equipment from the various government arsenals. Professor R. H. Smith personally inspected all of the apparatus selected, with the result that the Institute has secured some of the best tools avail-

able. The equipment of the Machine Tool Laboratory is, without doubt, superior to that of any engineering school in the country.

The Foundry equipment has been enlarged by the addition of thirty-six benches made by the students, so that it is now possible to take care of seventy-two men in one section in Foundry work.

In Pattern Making sections from forty to fifty men can now be accommodated.

It became necessary to add to the second year drawing room about 120 desks, increasing the equipment in this room to about three hundred. The third year Drawing Room, which was originally planned for 240 desks, has had a few more added; and the Senior Drawing Room, originally planned for 107, was run to full capacity with one man assigned to each desk. These desks were designed, however, with two sets of drawers per desk, so that by dividing the senior class into two sections it is possible to accommodate 214 men provided one section works in the forenoon and the other section in the afternoon.

A Nash gas engine with directly connected generator has been installed in the Gas Laboratory and a considerable amount of apparatus for the measurement of the transfer of heat, and heat flow has been erected in the Refrigerating Laboratory.

On account of the sickness of Professor Taft and Mr. Jones the instructors in Heat Engineering had to carry a very severe overload during the second and third terms.

Associate professors Berry, Hayward and Riley have been promoted to full professorships and Mr. J. J. Eames has been promoted to the grade of Assistant Professor.

The School for Training Engineer Officers for the Merchant Marine established at Technology by the United States Shipping Board has been continued and is still running.

The De Laval Separator Company has presented the Department with a new form of centrifugal oil separator. Certain pyrometer sundries have been presented to the Testing Materials Laboratory by the Taylor Instrument Company, the Bristol Company and the Brown Instrument Company. These same companies have also loaned various instruments to the Department for use in the laboratories.

The Machine Tool Laboratory has received the following gifts:

From Jones & Lamson Machine Company, Springfield, Vt.: One (1) 2 inch by 24 inch Flat Turret Lathe. (This was in exchange for an old Turret Lathe.)

From The L. S. Starrett Company, Athol, Mass.: Fine Mechanical Tools and Instruments.

From The Hendey Machine Company, Torrington, Conn.: A Relieving Attachment for Hendey Lathe.

From The Precision Truing Machine & Tool Company, Cincinnati, Ohio: One (1) Precision Truing Machine.

From The Daehler Die Casting Company, Brooklyn, N. Y.: A Wall Display Case of Die Castings of Machine Parts.

From Magnesia Association of America: An Exhibition Case.

The demand for graduates is such that every senior had at least fifteen opportunities to select from. One month before graduation fifty of the mechanicals had been placed with an average salary of $147.50 per month.

EDWARD F. MILLER.

DEPARTMENT OF MINING ENGINEERING AND METALLURGY

Upon request of Professor Hofman I have assembled the data for a report on the operation of the Department of Mining Engineering and Metallurgy during the year ending October 1.

Course Changes. We have passed through the transition year and are now embarking in all four classes on the regular three-term schedules involving changes mentioned last year. These schedules allow for a continuance of the three Options, Option 1 being the General Option, Option 2 the Metallurgical Option, and Option 3, the Geological Option, the last named having been restored to its status as it existed before the period of co-operation with Harvard.

Organization and Methods of Instruction. The Department of Mining Engineering and Metallurgy has been combined with the Department of Geology and Geological Engineering to form

a Department of Mining, Metallurgy and Geology under the charge of Professor Lindgren.

Another change which will not be finally consummated until space becomes available in the new Pratt building, is the combination of the work in metallography under the direction of Professor Henry Fay. Instruction in this subject began at the Institute as a branch of Metallurgy and has been continued along this line, but the point has now been reached where a knowledge of it is considered necessary for students in other departments, so that Metallography is now deemed of sufficient importance to form a separate division of instruction.

The change inaugurated by Professor C. R. Hayward in the instruction of iron and steel whereby the former pure lecture course has been abandoned for a combination of lectures, reading, visit to plants and written reports, has worked out extremely satisfactorily.

Following the regular work of the Summer Surveying Camp at East Machias the Mining students were given two weeks' instruction in underground surveying in a mine at Pike Hill, Vermont, accompanied by field instruction in Geology. This scheme worked out very well. It would be advantageous if in the future the entire instruction in surveying be given at Pike Hill and that this be combined with brief courses in practical geology, mining and ore dressing.

The United States Smelting, Refining and Mining Company has resumed research work in the department and now occupy two rooms in the department building.

Space and Apparatus. The mining building was planned and built to accommodate the increased number of students that are now coming to us, but the needs of the chemical department have taken away considerable space so that we are now approaching the former crowded conditions of the old Rogers basement. The seating capacity of the department library is insufficient at certain periods for the men assigned to reading; very limited space is available for research; there is practically no room for drafting in connection with mapping and construction involving mill, mill and metallurgical plant design. The storage space available for ores, fluxes, fuel and products, a large stock of which must necessarily be kept on hand where we are so far removed from mining centers, has never been adequate.

A Deister Plat-O table and a new Ruth flotation machine, presented by the Deister Machinery Co., have been installed in the Ore Dressing Laboratory. In Fire Metallurgy a Wilson Maulein switchboard with rheostats has been made a part of the pyrometer and furnace equipment. The Oliver continuous filter presented to the department last year has been installed in the Wet Metallurgy laboratory and is ready for use.

Students. We are now realizing our expectations in the number of students attending. The Senior class has thirty men and the Junior and Sophomore classes have about fifty men each, all fairly well distributed in the three options. The graduating class of June, 1920, consisted of seventeen men, all of whom were immediately very well placed in positions, owing to the fact that there were about five positions open for each man available. The demand for men still continues and we are unable to satisfy it, but we hope that the stituation will improve in the future when the present larger classes shall have graduated.

Opportunity was also offered for all undergraduates who desired practical work in mining or metallurgy during the summer vacation. An unusual feature during the past summer was the large number of men who preferred iron and steel work to mining. The Metallurgical Option is becoming increasingly popular and an unusually large number of the men are preparing to enter the iron and steel industry.

Professional Work. Professor Hofman has devoted all his spare time to his book on the metallurgy of zinc, and he hopes to have the manuscript completed this coming year.

Professor Locke has continued his research on jerking tables for ore concentration, and also with Professor Richards has been engaged on some important work in ore dressing bearing upon the present flotation litigation.

Professor Bugbee served as an expert in litigation concerning ore buying.

Professor Hayward's elaborate investigation of potash-bearing slate has worked out so successfully in the laboratory that steps are now being taken for the erection of a small experimental plant. Several theses have been written on the results of sulphatizing roasting and when more data have been accumulated these will form an important contribution to this subject.

WALDEMAR LINDGREN.

DEPARTMENT OF ARCHITECTURE

Including the Division of Drawing

The year 1919-1920 saw the further adjustment to a normal condition of the irregularities inherited from the war years towards which a first step had been taken in the latter part of the previous year. Between 115 and 120 students were enrolled in the Department, of whom nearly one-half were in the second year class. One hundred were regular students working for the degree of the Institute while 18 were special students. Fifty-three had received full or partial college courses.

The instruction in Design as outlined in the previous report produced distinctly satisfactory results and has been adhered to for the year 1920-1921 with certain changes in the personnel.

In this connection it is with the greatest regret that the loss of the services of Mr. Stephen Codman is recorded. His devotion to the best interests of the Department, both for personal reasons and because of his affection for Professor Despradelle, has been a constant help and inspiration. The Department, however, is sure of his unfailing interest, and accepts most reluctantly his decison to give his entire time to his practice.

The teaching staff of Option 2 (Architectural Engineering) is unchanged, and continues, under the direction of Professor W. H. Lawrence, to graduate students of such a caliber that the demand is far in excess of the supply.

The new head of the Department, William Emerson, assumed his responsibilities in the middle of November. The spirit of co-operation with which he was received by the entire Department has been a source of personal gratification and an enormous encouragement in handling the problems that confront the Department.

That a carefully considered policy in the teaching of design was essential to the future success of the Department was obvious and a matter of agreement between the staff and President Maclaurin. It was further evident that such a policy should preferably be pursued under the guidance of some one individual. It is therefore a source of great satisfaction to announce at this time that in October, 1921, Mr. Albert Ferran, a graduate of the

Ecole des Beaux Arts, student of M. Victor Laloux, and winner of the Grand Prix de Rome in 1914, will take charge of the teaching of Design in this Department.

While it is generally recognized that it is not the province of a School of Architecture to turn out draughtsmen, it is nevertheless apparent that familiarity with office procedure would be of great value to the graduating student in enabling him more readily to adapt himself to office conditions and thus secure better opportunities for employment. With this in mind the Department is taking the necessary steps to make a course in office practice given in the summer a part of its requirements for the degree. As such a course will deprive many students of a needed opportunity to earn enough to cover their winter's expenses, the necessity for increased scholarship aid to undergraduate students becomes evident.

At the meeting of the Association of Collegiate Schools of Architecture, held the first of May in Washington, and attended by Professors Emerson, Lawrence and Gardner, it was generally admitted that there was need for more time to cover the requirements for an architectural degree for students coming directly from high school. This situation can be met by making more exacting demands for admission, or by giving more time to the required course. Both alternatives might well be used to the advantage of the students and to the betterment of the reputation of our architectural degree. It should, however, be constantly borne in mind that this Department aims to offer a course in Architecture that shall meet the needs of the high school student and at the same time provide special opportunities for the graduates of other institutions.

To attain the end just suggested, a step has already been taken that is helpful. First year drawing, both mechanical and freehand, has been so adjusted to the needs of the architectural student that he is much better qualified to meet the requirements of Design I than ever before. This, taken in conjunction with the fact that the Department of Drawing has become a part of the Department of Architecture as the Division of Drawing, under the direction of Professor W. H. Lawrence, is full of promise for the future. The report of the Division of Drawing follows this report.

An effort will be made to impress upon the students in Options

1 and 2 the value of the work that each has to perform under the other Option. The prevalent tendency in professional life for engineers and architects to belittle the value of one another's work is so unfortunate, particularly at this time in the world's history when co-operation should be the watchword, as to make the Department doubly eager to implant in the mind of the architect a wholesome respect for sound construction, and in that of the engineer a corresponding regard for good design.

The normal development of the present purpose of the Department would result in eventually offering in addition to Options 1 and 2 in General Architecture and Architectural Engineering, electives in decoration, town planning, etc., so that with a fundamental training in Architecture these other branches could be elected by advanced students.

Coupled with this development in the scope of the Department's work is a gratifying growth of an *"esprit de corps"* in the undergraduate body. The organization of a self-government committee, and the providing of a common room for student-meetings are steps in this direction to which there has been an immediate response.

Gratifying interest by the students has been shown in the lectures by practising architects, and in the exhibitions that have been given in the course of the year. In consequence both these features will be further developed this year.

Following is the list of prize winners for the year, as well as special prizes and gifts received:

Traveling Fellowship in Architecture; Leon Keach, '17.

George R. White Prize; W. E. Church.

Sociètè des Architectes Diplomès par le Gouvernement Francais; gold medal, W. B. Riddell; silver medal, H. F. Shirer.

Boston Society of Architects' Prizes: F. A. Bermingham, regular student, W. B. Riddell, special student.

Francis W. Chandler Prizes: Grade III, F. A. Bermingham and A. L. Williams; Grade II, W. T. Vahlberg.

Class of 1904 Prizes: M. A. Spencer, regular student, L. P. Botting, special student.

Rotch Prizes: F. A. Bermingham, regular student, D. A. Reed, Jr., special student.

American Institute of Architects' Medal; F. A. Bermingham

Mr. George R. White, of Boston, offered a prize of $100 to Grade II and III students for the best solution of stair building; architectural pictures and books were presented to the Department from the library of Professor William R. Ware, its founder.

It was not possible because of conflicting dates and methods of instruction in design to have more than two conjunctive problems with Harvard Architectural School during the year, but a complete system of co-operation in this respect has been arranged for the current year.

As an encouragement to the undergraduates and as a backing to the new head of the Department, an appeal has been made to all alumni to speak a good word for the Department in whatever part of the country they may be. To this end the "Bulletin of the Society of Technology Architects" has given each term a statement of what the aims and accomplishments of the Department have been. A further step in this direction was the formation of an alumni advisory council.

Evidence of the spirit roused is shown in the work of Bellows, 04, and Aldrich, '01, in placing their own services and those of the Tech men in their office at the disposal of the Department in preparing plans and carrying through the work on the new common room. Mr. Aldrich has further made a design for a medal which will hereafter be given to all prize winners; Mr. F. L. W. Richardson, '03, placed his house and grounds at the disposal of the students for a picnic in the spring, while Mr. Henry F. Bigelow, '88, similarly opened his house to our students. Gifts amounting to $500 were likewise received for sending one of our men with the Harvard unit to work in the devastated regions of France during the summer months. This sort of co-operation is of the greatest possible value.

No such report can close without an expression of the loss that this Department experienced in the death of President Maclaurin. To the new head of the Department it was staggering as Dr. Maclaurin alone had fully realized the radical measures that must be undertaken to re-establish the standing of the Architectural Department. The loss of his experienced guidance at such a time, not to mention his friendly countenance and encouragement, was deeply felt, but his example of self-sacrificing

devotion is a constant inspiration to further effort in the direction that he had so wisely indicated.

The Department is under a deep sense of obligation to the Administrative and Executive Committees, as well as to the Visiting Committee and many individual Boston architects, for the loyal support and ready recognition of its needs that have marked the past year. Such sympathetic understanding and backing are an encouragement to new effort in an attempt to make the Department representative of the best that can be offered.

WILLIAM EMERSON.

DIVISION OF DRAWING

The point of greatest interest is the association of the Department of Drawing with that of Architecture, the former to be known hereafter as the Division of Drawing. It is to be hoped that this association may add to the strength of both Departments and to the Institute as a whole. Dean A. E. Burton, formerly in charge, had to withdraw in order to have his whole time to devote to his greatly increased duties as Dean of the students.

The plan of interchanging instructors between the Drawing Department and some of the professional departments which has been tried in a small way during the last two years, will be somewhat enlarged during the coming year, and it is hoped that increased opportunities for such interchange may be found in the future. The instructors coming from other departments will bring to the Department of Drawing a professional point of view emphasizing the practical application of descriptive geometry to the latter work, while the opportunity for the instructors in drawing to teach professional courses of the later years will tend to bring into still closer relation the freshman drawing and the work for which it is a partial preparation. A course consisting of the solution of a series of problems in descriptive geometry, simply as such, has very little excuse for being. Unless through it the student is taught real methods of study, to discriminate between principle and special case, and to apply the principles to original work, the course is worse than a failure, for it has wasted valuable time of the student. A few principles well digested, with some power in their application, are worth more than the study of an

infinite number of special cases with the principles and their applications unrecognized.

Some modifications in the drawing courses have been made during the year as a result of conferences with representatives of the professional departments. Among the most important are the transfer to the Department of Drawing some of the work in machine drawing, formerly given in the second year by the Department of Mechanical Engineering, and special courses in freehand and mechanical drawing arranged for the students in Architecture. The courses in freehand drawing and life class of the second, third, fourth, and graduate years, formerly controlled by the Department of Drawing, will now be listed under the professional architectural subjects, and will no longer be open to students not entitled to the professional subjects in Architecture.

W. H. LAWRENCE.

DEPARTMENT OF CHEMISTRY AND CHEMICAL ENGINEERING

The past year has been replete with changes which are of far-reaching importance.

On January 1, 1920, Professor Arthur A. Noyes resigned from his positions as Professor of Theoretical Chemistry and Director of the Research Laboratory of Physical Chemistry to devote his entire time to the Directorship of Chemical Research at the California Institute of Technology, where exceptional facilities for research in Chemistry and Physics have been provided for him and his co-laborers. With the exception of two years spent abroad, Dr. Noyes had been continuously associated with the Instructing Staff of the Institute since 1887, having served for two years as Acting President. During that time he had achieved an international reputation for his scientific work. His inauguration and conduct of the Research Laboratory of Physical Chemistry gave a marked impetus to research at the Institute which has not been lost and for the growth of which Dr. Noyes constantly labored. Under his direction the instruction in Theoretical Chemistry in both class room and laboratory underwent important

and unique development, and all the activities of the Department, and many activities outside the Department, bear the impress of his fertility of suggestion. The recognition of the significance of this long and fruitful service lends greater sincerity to the good wishes of his former colleagues for his prosperity in his new work.

Professor Sherrill has been placed in charge of the instructional work in Theoretical Chemistry formerly under Dr. Noyes' direction, and Professor Keyes has been made Director of the Research Laboratory of Physical Chemistry.

The Department has also lost the services of another member of Faculty grade through the resignation of Associate Professor E. B. Spear, who is now associated with the Goodyear Tire and Rubber Company. Dr. Spear has been a member of the staff for fourteen years, and through his enthusiasm as a teacher and his interest in research has strengthened the Department.

In order that he might devote his entire time to the Directorship of the newly established Division of Industrial Co-operation and Research, Professor W. H. Walker was obliged to withdraw from the Directorship of the Research Laboratory of Applied Chemistry and that of the School of Chemical Engineering Practice, and to relinquish the charge of the Course in Chemical Engineering. This necessitated an extensive revision of the personnel of the division of the Department devoted to Chemical Engineering, and the final outcome, approved by the Executive Committee to take effect July 1, 1920, has been the inauguration of a separate Department of Chemical Engineering to include the members of the staff teaching chemical engineering and closely allied subjects the staff of the Research Laboratory of Applied Chemistry, and that of the School of Chemical Engineering Practice. Professor Warren K. Lewis has been appointed as the head of the new Department. The Directorship of the Research Laboratory of Applied Chemistry is in the hands of Assistant Professor Robert E. Wilson, and that of the School of Chemical Engineering Practice in those of Assistant Professor Robert T. Haslam. The establishment of the new Department is a deserved recognition of the pioneer instructional work in this field of engineering which has been built up under the leadership of Professors Walker and Lewis.

The Department of Chemistry will in the future include the

instructors in chemical subjects and the staff of the Research Laboratory of Physical Chemistry, the latter under the immediate direction of Professor Keyes.

The School of Chemical Engineering Practice has been re-opened with three Stations: One of these is associated with the Eastern Manufacturing Company and the Penobscott Chemical Fibre Company at Bangor, Maine, and is under the direction of Assistant Professor Walter G. Whitman. The second station is located at Buffalo, New York, in association with the Lackawanna Steel Company and the Larkin Company, and is directed by Assistant Professor Dustin W. Wilson. The third Station is at Everett, Massachusetts, and is operated in conjunction with the Merrimac Chemical Company, the Revere Sugar Refinery and the Boston Rubber Shoe Company. Assistant Professor Paul G. Woodward is Director of this Station. Thirty students are participating in this School, which gives every promise of maintaining the successful achievements of the period before the School was interrupted by the war.

The Instructing Staff of the Department of Chemistry has been strengthened by the addition of three new members of Faculty grade. Dr. H. Monmouth Smith, formerly of Syracuse University and lately engaged in research at the Carnegie Nutrition Laboratory, has been appointed Professor, and Dr. Walter Schumb, lately of Vassar College, Assistant Professor of Inorganic Chemistry, both of whom will be immediately associated with the instruction of first-year students. Dr. Louis J. Gillespie has been appointed Assistant Professor of Physical Chemistry, and will be connected with the Research Laboratory. Assistant Professors Edward Mueller and Joseph W. Phelan have been promoted to be Associate Professors of Inorganic Chemistry, and Mr. F. R. Kneeland and Dr. T. L. Davis to be Assistant Professors of Organic Chemistry.

The great increase in the number of students taking chemical subjects has made it necessary to utilize one of the laboratories assigned to the Department of Mining Engineering for the work in analytical chemistry during a part of the year, and to equip a laboratory in one of the buildings formerly used as a barracks for the work in industrial chemistry. It has also been necessary to expand the work of the Research Laboratories of Applied

Chemistry and of Physical Chemistry as is noted in the Reports of the Directors. During the summer an additional instructional laboratory and two research laboratories for organic chemistry have also been fitted up.

The du Pont Fellowship was renewed for the past year and has again been renewed for the coming year. The Monsanto Chemical Company has also donated a Fellowship for the past year and the Grasselli Chemical Company has donated a Fellowship and a Scholarship for the coming year. This form of co-operation is of great significance and value as an incentive for advanced work. It has been decided to allow the income from the Ellen H. Richards Fund to accummulate for a year in order to be able to offer a larger remuneration to a research worker in the year following.

H. P. TALBOT.

RESEARCH LABORATORY OF PHYSICAL CHEMISTRY

During the past year, the reorganization of the Research Laboratory of Physical Chemistry was vigorously prosecuted, following the devotion of the laboratory facilities to research work bearing on war problems. Certain researches, for example, on the formation and decomposition of iron nitride and on the gas equilibria involved in the production of ammonia by the synthetic process, were completed to a point where the results are of definite value. Much equipment had been expended during the war period, but in spite of the considerable delays in obtaining materials, facilities were maintained adequate for the continuation of investigations dropped in 1917 and the initiation of new ones. Eleven graduate students undertook research problems continuing the investigations of A. A. Noyes, D. A. MacInnes and F. G. Keyes on the solution theory, electro-chemical theory, crystal structure and the continuity of the states of aggregation.

In the fall, the Bureau of Mines invited the co-operation of the laboratory in connection with the helium extraction research program for the Army and Navy. A number of problems were accepted for solution, the expenses connected therewith being met by a generous allotment of funds.

For several years, Prof. A. A. Noyes had devoted much time

to the establishing and perfection of facilities for research in the California Institute of Technology, Pasadena, Cal. Professor Noyes had for many years felt the rigors of the New England climate, and finally resigned directorship of the Research Laboratory of Physical Chemistry to devote his entire time to the maintenance of a research center at the California Institute. His loss to the Institute, where he had devoted much time, is very considerable, particularly in the Research Laboratory, for the establishment of which he was largely instrumental nearly a score of years ago. Professor Frederick G. Keyes was appointed to succeed Professor Noyes as Laboratory director.

In the spring, plans matured for increasing the permanent laboratory personnel approaching that which prevailed prior to occupying the new Institute buildings in 1916. Dr. L. J. Gillespie was appointed assistant professor, and three research associateships and an assistantship were created by the Administrative Committee of the Institute. The importance of establishing the research associateships is fundamental, since it provides a means of enabling especially promising investigators to continue the prosecution of their researches, thus developing exceptional scientific ability. James A. Beattie and Charles E. Ruby, having been granted the degree of Doctor of Philosophy in June, were appointed research associates for the ensuing year. Dr. Beattie will continue his work in connection with the continuity of the liquid and solid phases, while Dr. Ruby will pursue investigations relating to ionic theory.

Dr. D. A. MacInnes has continued actively his investigations on the relation between overvoltage and pressure; on salt solution junction potentials, and on the activity of ions in solutions of mixed electrolytes, together with certain free energy studies of dilution. The work in connection with the intensity of X-ray reflections from crystals is being continued with the aid of Mr. T. Shedlovsky. Dr. MacInnes with the assistance of Mr. C. R. Park will also direct in the forthcoming year the working out of an Experimental Problems Course along lines which will provide an introductory training in research for seniors.

Dr. F. G. Keyes has resumed his investigations in connection with the continuity of liquids and gaseous states of equilibrium. Plans for the extension to the solid phase have been perfected and

will be worked out in the ensuing year. The work in connection with the helium project of the Bureau of Mines is connected with the properties of mixtures of methane and nitrogen, of ethane and methane, and also the latent heats of evaporation of these mixtures. The specific heats will also be measured in the region of liquid air temperatures. This work has required the origination and perfection of facilities for low temperature research work which have been contemplated for a number of years and the results will form a valuable scientific contribution, aside from the great need which is felt for the data in connection with the suitable designing of the helium extraction apparatus. The Physics Department is co-operating in this work and Messrs. Townshend and Young of that department are prosecuting the work in connection with the heat measurement phase of the general problem.

The additional space provided for the laboratory is to be utilized as a laboratory for measurements of chemical equilibria, the organization and direction of which will be in charge of Dr. L. J. Gillespie.

FREDERICK G. KEYES.

RESEARCH LABORATORY OF APPLIED CHEMISTRY

The Laboratory has concluded the most successful year of its history. It has practically trebled in size, enlarged its scope, and made important contributions toward the solution of several scientific and industrial problems.

Reorganization. On account of the pressure of his duties as Director of the newly created Division of Industrial Co-operation and Research, Dr. W. H. Walker, founder and for many years Director of the Laboratory, found it necessary to resign. Fortunately, however, he maintains his interest in the Laboratory and is a continuing source of inspiration to its workers. Professor Robert E. Wilson, formerly Assistant Director, has been appointed Director, with Dr. L. W. Parsons, as Assistant Director, in charge of inorganic problems, and Dr. C. S. Venable, as Assistant Director, in charge of organic problems. The Laboratory has been made a part of the newly created Department of Chemical Engineering.

The Laboratory has been fortunate in securing the services

of Dr. C. Nusbaum, who has had a wide experience in research in pure physics and physical chemistry.

Aim of the Laboratory. It is the plan of the Laboratory to (1) co-operate with the industries in solving their more fundamental chemical problems; (2) carry on "pro bono publico" research along lines of fundamental scientific interest, the results of which are freely published; (3) guide the thesis work of increasing numbers of undergraduate and graduate students; (4) train men for responsible research positions in the industries; (5) aid in fulfilling obligations of the Institute to the industrial firms contracting under the Technology Plan.

The success of the Laboratory as an aid to the industries has brought about the renewal, frequently on an enlarged basis, of all of the contracts made by the Laboratory last year, and the addition of several others.

Industrial Research. At present the following major problems are being investigated for industrial concerns, about three-fourths of which are contractors under the Technology Plan:

For the Goodyear Tire and Rubber Company: (1) Studies on the function of various compounding ingredients used in rubber and the improvement of the present methods of tire manufacture. (2) Methods of producing high grade carbon black for the rubber industry. (3) Process for separating helium from natural gas.

For the Vacuum Oil Company: (1) Decolorizing heavy mineral oils. (2) The manufacture of oil barrels with a view to preventing leakage during shipment.

For the National Tube Company: (1) Relative resistance to the flow of liquids offered by various kinds of pipes. (2) The prevention of corrosion.

For the National Electrolytic Company: Certain important organic syntheses.

For the Clinton Metallic Paint Company: Study of high temperature cements.

For the American Radio and Research Corporation: Determination of the best method of forming the insulating film on aluminum condenser plates.

For the Mead Pulp and Paper Company: Factors underlying and the improvement of the various methods of paper manufacture from wood pulp.

For the Angier Mills: Preparation of specially impregnated papers.

For the Narrow Fabric Company: Improved types of shoe laces.

For the Babcock & Wilcox Company: Causes for the development of defects in boilers which are evaporating alkaline solutions.

For Henry Disston & Sons: Methods of welding steel band saws.

Educational. The selection of subjects for and the direction of thesis work is forming an increasingly important function of the Laboratory owing to the large number of students in the chemistry courses. During the past year the thesis work of sixteen men, mostly for the S.B. degree, has been supervised by various members of the Laboratory.

In the conduct of thesis work, it has been found that this close contact with men who are devoting full time to research work, and who have access to various industrial plants is of great value to the student and also is productive of valuable data and ideas which are helpful in the solution of industrial problems.

Other Research. Several "pro bono publico" researches have been brought to a satisfactory conclusion the past year and new ones have been started. The following may be mentioned:

(1) Electrolytic production of permanganates.

(2) Production of benzophenone and benzoic acid from benzene and phosgene.

(3) Investigation of the mechanism of hydrolysis of various compounds.

(4) Analytical methods for the determination of permanganates in the presence of other oxidizing agents.

(5) Electrolytic halogenation of various types of organic compounds.

(6) Mechanism of lubrication.

(7) Relating to surface tension and absorption and their bearing on various industrial problems.

(8) Factors influencing the covering power of pigments and the function of emulsifiers in paints.

(9) Preparation and properties of beryllium and its alloys.

(10) The adsorption of oxygen and nitrogen by charcoal.

(11) Soda lime for industrial purposes.

Equipment. The additional space granted to the Laboratory on the fourth floor of the Mining Building has been of great help in caring for the increased amount of work coming to the Laboratory. These quarters have been outgrown, however, and further laboratory space has been obtained by partitioning off a part of the large Industrial Chemical Laboratory in Building 2. It is unfortunate that the laboratories have to be thus maintained in different sections of the building, and it is to be hoped that with the plans for future expansion in the Department facilities may be provided for the Research Laboratory so that work may be carried on in a single group of rooms.

The Laboratory is grateful for the support and co-operation of the different departments at the Institute, especially in furnishing advice and apparatus to aid it in carrying out investigations for Technology Plan contractors. As the Laboratory grows in personnel and equipment it is anxious to repay these favors in kind, and co-operate in all possible ways with other departments.

ROBERT E. WILSON.

DEPARTMENT OF ELECTRICAL ENGINEERING

A striking feature of the work of the Department during the year is the effective manner in which staff and students have steadied down from the disorganizing influences of the war. The loss of staff to the Army and Navy and war industries in 1917 and 1918 broke up our facilities for teaching and for research, but the renewed and improved undergraduate curriculum has been in good effect during the past year and the program for research has been re-established and research assistants are now being provided.

A notable fact of the Department's activities for the year, in undergraduate instruction, is the marked success of the Co-operative Course run in connection with the Lynn works of the General Electric Company (called Course VI-A), which has created a great deal of interest in the industrial and educational world and by its results for the students is fully supporting our expectations. The General Electric Company has raised the limit of number of students who may go into this course each year, and we have

therefore admitted 52 Juniors. There are now two classes—Juniors and Seniors — in the Course. Next year all three classes—Juniors, Seniors and Graduates — will be in attendance. This will make a large addition to the number of students who are candidates for higher degrees, and will add equally to students who work on problems of original research.

The interchange of students in Course VI-A between the Institute and the Lynn Works made it desirable to provide conveniences for housing at the Institute which correspond with those provided by the General Electric Company at Lynn. In the absence of sufficient dormitory facilities on the Institute grounds it has been arranged that these students may room in a dormitory made from one of the houses owned by the Institute near its old site.

The Department has been responsible for an unusual amount of teaching during the past summer, as instruction for Course VI-A students and special instruction for officers of the Engineer Corps, U. S. Army, have been added to the usual electrical engineering instruction in the Summer School. It is very undesirable for the staff to be obliged to give instruction the year round, as this tends to develop a routine with loss of fire and initiative.

An important matter is the assignment of Professor Drisko of the Physics Department to this Department for sufficient hours to develop the instruction and research in illuminating engineering and the formation (now under way) of an alumni committee to guide this development. Other such committees will be formed during the course of the year, as a consequence of expressions of willingness by many alumni to serve, which were made at the Course VI luncheon at the Reunion in June.

The Chief of Coast Artillery, U. S. Army, returned to the practice in effect before the war of detailing officers to the Institute for a special course in electrical engineering and internal combustion engines, and the Chief Signal Officer, U. S. Army, adopted a corresponding practice by detailing officers to study methods of electrical communication. Other branches of the Army are now sending officers to the Institute with rather more definite programs of study in several departments.

The Ecole Centrale des Arts et Manufactures of Paris, France, invited us to exchange an instructor in electrical engineering with

them. As the Ecole Centrale is a notable school of engineering, acceptance of this invitation was approved by President Maclaurin. It is believed that the exchange will be of service to both institutions, and may become an annual matter.

Mr. C. W. Ricker received the merited promotion to Assistant Professor.

DUGALD C. JACKSON.

DEPARTMENT OF BIOLOGY AND PUBLIC HEALTH

The present statement covers the two years 1918-19 and 1919-20. The former saw the return to active and regular service of Professor Prescott, who had been serving as Major in the Department of Food and Nutrition, Sanitary Corps, U. S. Army, and Mr. C. E. Turner, Instructor, who had been serving as Sanitary Engineer, U. S. Public Health Service, in charge of shipyard sanitation in the Eastern District.

Increasing attention is being given by the Department and especially by Professor Prescott and his students to work upon the bacterial infection of foods and other subjects of Industrial Biology and several of our recent graduates have entered this field professionally with marked advantage both to the industries and to themselves. Professor Prescott's investigations on food dehydration, begun during the war, have been carried on under the auspices of the U. S Department of Agriculture and largely in the laboratories of the Department until June 30 of the present year. He has also served on a Committee of the National Research Council as representative of the Society of American Bacteriologists and likewise upon the Advisory Board of the American Institute of Baking.

In the summer of 1919, Mr. Horwood, Instructor in Bacteriology, went for the second time to Oklahoma as sanitary investigator for the Anti-Tuberculosis Association of that State, and as such was able to complete extensive Public Health Surveys of certain Oklahoma cities which he had begun in the summer of 1918. Eight of the principal cities of Oklahoma were thus studied,

and two complete reports have already been published. In the winter of 1919-20 a special course was given by Mr. Horwood under the auspices of the School of Public Health (see *infra*), one evening each week, from 7.30 to 9.30 in the Bacteriological Laboratories of the Institute.

In January, 1919, Professor Sedgwick was invited by the authorities of the University of California to deliver Summer Courses in Public Health subjects at the State University at Berkeley. He was accordingly released from the Institute in May and spent the summer in California, studying *en route* the State Board of Health activities of New Mexico and of Utah, as well as those of California.

Shortly before his death President Maclaurin requested Professor Sedgwick to proceed to England, to serve as an Exchange Professor from the Institute to the Universities of Leeds and of Cambridge. This mission was arranged as an outcome of the visit of the British Educational Mission to America and to the Institute in December, 1918, and in consequence of correspondence between President Maclaurin and Sir Arthur E. Shipley, K. B. E., at that time Vice Chancellor of the University of Cambridge, and with Sir Michael Sadler, Vice Chancellor of the University of Leeds.

The Institute authorities having decided that Dr. Maclaurin's plan should be carried out, Professor Sedgwick left New York on April 15 and proceeded to the University of Leeds, where he was most cordially received and where he remained for three weeks, afterward going on to Cambridge for the remainder of the spring term. He returned to Boston October 4, and will make a special and separate report upon his activities at the Universities named.

In June, 1919, Mr. Turner was made an Assistant Professor of Biology and Public Health, and Mr. James M. Strang became Assistant in the same subjects. Mr. S. J. Hayes, S. M. 1920, before the end of his course was selected by a prominent manufacturing firm for a special mission to India in connection with studies on the fermentation of jute, and at the time of this writing has arrived in India and has begun his work. All the graduates of recent years are actively engaged in professional work at excellent salaries, and the demand for young men and young women thoroughly trained in biology and public health continues to

exceed the supply. In special request have been men prepared to deal with problems of industrial biology and with advanced bacteriology, subjects in which the Department fortunately is strong.

Assistant Professor Turner has found time during the year to prepare and publish an important work of four hundred pages on "Dental and General Hygiene," which is the first in English to cover a broad field just beginning to be intelligently cultivated.

W. T. SEDGWICK.

SCHOOL OF PUBLIC HEALTH

This School, conducted on a volunteer basis and by special arrangement with Harvard University, has continued to do useful work, training young men and young women for positions in the public health service as Health Officers, Laboratorians, Sanitary Inspectors, Statisticians, and workers in public health education. Thirteen (13) candidates were granted the certificate in Public Health (C.P.H.) in June, 1920, and three (3) in 1919.

The demand for such workers properly equipped still far exceeds the supply and while increased financial support is indispensable if the field is to be adequately covered, the School remains an instructive model and demonstration of what can be done to meet a public need by assembling courses of instruction in neighboring educational institutions co-operating in a cordial spirit of public service.

Brief reference has been made elsewhere to an evening course in Veterinary Bacteriology given in the Biological Laboratories of the Institute by Mr. M. P. Horwood, Instructor in Bacteriology. For this course an earnest request was made by a number of veterinarians regularly employed during the day in the service of the State by the Bureau of Animal Industry, Department of Conservation.

Inasmuch as the course would inevitably be somewhat expensive and would require much labor both on the part of the instructor and of the students, an appeal was made to the Trustees of the Lowell Institute for financial assistance, which was cordially granted. It was further arranged that the course should be given

under the auspices of the School of Public Health of Harvard University and the Massachusetts Institute of Technology, and while most of the seventeen who attended it were State Veterinarians, some others sought admission, two coming from Worcester every week, one from Fall River and one from Gloucester. In spite of the fact that the course was thorough and exacting fifteen out of seventeen completed it and passed a severe final examination — two having dropped out because of sickness.

It is believed that the giving of this course constituted an important service to the State.

W. T. SEDGWICK, *Chairman.*

DEPARTMENT OF PHYSICS

Including Electrochemical and Aeronautical Engineering

Gifts to the Department. The most important gift for Departmental uses was the Malcolm Cotton Brown Fellowship established by the parents of Lieutenant Brown, a former student of Course VIII, who died in the Air Service during the War. The Fellowship is to help a Senior in Course VIII to carry his work into a Graduate Year. Two valuable large electrostatic machines, which will be useful in X-ray research, were received through the kindness of Dr. Francis H. Williams. The Department is indebted to many other donors for a great variety of gifts highly appreciated although not here detailed.

Departmental Changes. In recognition of the growing importance of applied optics and of photography in the industry of the Nation, a chair of Applied Optics and Photography was established; the incumbency falls upon Professor Derr long interested in special work in these lines. A great loss was suffered in the resignation of Professor D. L. Webster, one of the country's leading young research men in pure physics, particularly in the field of X-rays, who accepted a call to be Head of the Department of Physics at Leland Stanford Junior University. We are fortunate in securing Mr. M. D. Hersey from the Bureau of Standards, Washington, as Associate Professor of Properties of Matter; his writings on general mechanics and his work on aeronautical instruments at

the Bureau are widely known. Incident to the retirement of Professor Peabody the work in Aeronautical Engineering has been transferred to the direction of Professor Wilson, ably assisted by Mr. E. P. Warner who returns to us, as Associate Professor of Aeronautical Engineering, from an important position under the National Advisory Committee for Aeronautics.

Educational. The Department is working over to the new basis of two years (freshman and sophomore) of general physics, instead of one year (sophomore) taken with greater intensiveness. The results in the freshman physics were highly gratifying; it can safely be said that the work of the freshmen was quite up to the level of that of former sophomore classes. The Department is gratified by the increased interest in Courses VIII and XIV among the undergraduates; the numbers in XIV have become almost embarrassingly large, those in VIII may easily become so; but there is great call for men in both lines.

Research. We have regained, if not augmented, our former activities, which were somewhat deranged owing to the War, in scientific and in industrial research, as reference to the bibliography of the Department will show in part.

EDWIN B. WILSON.

DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING

The year marks the transition to normal conditions after the difficult years of the war activities. The new division of the year in three terms has also become established and the teaching has been adjusted to these conditions.

Students. The number of undergraduate students in this Department has shown a tendency toward an increase which is still more marked during the academic year just started.

There were three candidates for the degree of Master of Science, and two candidates for the degree of Doctor of Science or Doctor of Philosophy. In considering the number of our students it must naturally be borne in mind that the students of Course III, Option 3, are very closely connected with the

Geological Department and really may be considered to belong to it as much as they do to the Mining Depatment.

Instructing Staff. Professor Lindgren was absent on leave from October 15 to December 20, and his place was temporarily filled by Dr. G. F. Loughlin of the United States Geological Survey. Mr. W. F. Jones, as in previous years, presented a course in Geology of Coal and Oil during the third term, and at the close of the term was appointed Assistant Professor to fill the place made vacant by the resignation during the previous year of Professor F. H. Lahee.

Collections and Instruments. The already very extensive collections in economic geology, petrography and paleontology have received many accessions during the year. The increasing number of students also require new purchases of microscopes which have proved very difficult to obtain, and the Department is still short of some of these instruments already ordered, for which delivery has not yet been made.

Research. The years during and following the war were marked by a falling off in research work by the Department, but it is probable that the present year will see a great increase in such undertakings. Special grants have been made for research purposes from the Bache Fund of the National Academy of Sciences to Professor Lindgren and to Professor Warren, each receiving the sum of $500 for the purpose of chemical work in connection with geological and petrographical investigations.

W. LINDGREN.

DEPARTMENT OF NAVAL ARCHITECTURE AND MARINE ENGINEERING

The Department was fortunate in being able to come back substantially to a normal basis during the past year, after the disarrangements due to the war. The senior class suffered less than might be expected, though there were some changes in the curriculum to adjust the work to that done while numbers of that class were in the Students Army Training Corps. The junior class could not begin work in the Department until the fall of

1919 but the changes in their curriculum were insignificant. The sophomore class is entirely normal.

The conditions for the officers of the corps of naval constructors were less fortunate but an arrangement was effected that was satisfactory to the Bureau of Construction and Repair and to the Institute. A class of about twenty officers which had been withdrawn on account of the war and had served actively for more than two years, returned in the fall of 1919 for a year's work. Though certain changes of curriculum were necessary the course was sufficient for completing their school instruction, especially as they had the advantage of two years of active service as already mentioned. The class was given the customary degree of Master of Science. In September two classes will come to the Department, one being a class sent under special arrangement in 1918 and withdrawn for active service during the present academic year; the other will be the regular class under normal conditions. The first mentioned class will remain at the Institute one year more under special instruction. The regular class consists of officers who have graduated from the Naval Academy, who have had a year or more sea experience and who have been under instruction during the past academic year at the Naval Academy; this class will remain two years at the Institute.

Professor William Hovgaard has published his work entitled, "Modern History of Warships."

The following changes have taken place in the staff of the Department: Professor Peabody has been retired and appointed Professor Emeritus. Professor H. H. W. Keith has resigned. Professor Jack has been appointed head of the Department.

C. H. PEABODY.

DEPARTMENT OF ECONOMICS AND STATISTICS

Equipment. In September, 1919, at the beginning of the academic year, the offices of the Department were transferred from Building 2 to Building 1, and provision was made for much more ample quarters than was previously possible. We now have six offices and also a large room for study and classroom purposes

immediately adjoining. This arrangement has given the instructing staff much more convenient opportunities and has brought them together in a group making immediate conference possible. Convenient near-by library facilities were also provided and this change has been of greatest value to the Department, owing to the increased enrollment, and has been much appreciated by the students in the course.

Educational. The instruction in Political Economy (Ec. 31) has been greatly extended, now running over three terms and being required of all courses in the third year. This has made possible more intensive instruction in the elements of economics and also has permitted, in the third term, a consideration of certain aspects of applied economics which are of special service to a graduate engineer in corporation finance, business management, accounting, marketing, and cost accounting. The total enrollment in the class was about 550.

In Accounting, given to second-year students in the course in Engineering Administration, the outstanding feature was abnormal growth in the size of the class, which numbered some 325 students, representing more than 100 per cent increase over the preceding year's enrollment. In the second-year class in Political Economy (Ec. 22), especially provided for students in Engineering Administration, the same problem of additional numbers presented itself.

In Securities and Investments, the plan of inviting outside lecturers was continued and the same is true of the course in Business Management. In this latter course additional attention was given to the subject of selling. Plant visits were increased from three to seven, but sales office visits were discontinued, owing to the size of the class.

Professional Work. Members of the staff have co-operated in outside activities which have a stimulating effect upon their teaching in the Institute, as follows:

Professor Doten has since February, 1919, been a member of the Committee of Advisors (three from the American Statistical Association and three from the American Economic Association) on the work of the Fourteenth Census. This committee has been engaged in advising the Director of the Census in making his preparations for taking the census and in compiling and publishing the results of the enumeration.

Professor Armstrong gave two courses in Boston University in Economics of Railway Transportation and in General Economics.

Professor Shugrue was engaged by the American Institute of Banking to give eighteen lectures on Foreign Exchange, and these lectures were repeated before a class in Boston University. D. Appleton and Company will shortly publish a book which Professor Shugrue has prepared, entitled, "Problems in Foreign Exchange."

Professor Schell served on the lecture staff of the Bureau of Industrial Research of New York City and also of the Business Training Corporation of New York City.

DAVIS R. DEWEY.

DEPARTMENT OF ENGLISH AND HISTORY

During the year the extended program of work in English and History authorized by the Faculty in the spring of 1919 was in part put into effect. The remainder of it comes into operation this year. A large number of new options have been offered in General Studies. The course in Applied Psychology given to the third-year students in Course XV by Professor Charles L. Stone of Dartmouth proved particularly successful, and the petition of the men at the end of the term that the work might be continued shows their appreciation of the value of this subject.

The Department has provided evening instruction at Lynn to the students taking the Co-operative Course in Electrical Engineering. The course in Committee Reports proved well adapted to the needs of these men for practice in presenting subjects orally, and was followed by more advanced work; the course was repeated during the summer for the class entering in July.

At the beginning of the year Professor Aydelotte was granted leave of absence for the purpose of organizing the selection of Rhodes Scholars in the United States. His place was taken by Professor DeWitt C. Croissant of George Washington University, who gave help of great value by his organization of the second-year course and by his effectiveness as a teacher.

The Department wishes to express its gratitude to the numerous outside speakers who have so generously co-operated in the work of the second and third years. HENRY G. PEARSON.

DEPARTMENT OF MODERN LANGUAGES

With the opening of the year, it became necessary to appoint several new instructors, and we were very fortunate in getting good and experienced teachers.

The instruction in German was divided among Professors Vogel and Kurrelmeyer, and Messrs. Ernst, Moore and Cawley; the sections in French and Spanish, among Professor Langley and Messrs. Cawley, Cook and Hanson. The average size of classes was about twenty.

Several third year options in French and German were offered, and were eagerly followed by a group of interested students.

Professor Vogel again served as Chief Reader in German, and Professors Langley and Kurrelmeyer also served as readers in French and German respectively, at the College Entrance Examination Board in New York last June. FRANK VOGEL.

DEPARTMENT OF MATHEMATICS

During the year, 1919-20, somewhat fundamental changes have been made in the mathematical curriculum, including the introduction of elementary calculus into the first term of the first year and the redistribution of later work, with sufficient elimination of non-essentials to make it possible to devote the third term of the second year to theoretical mechanics. This plan has enabled first-year students to make immediate use in their physics of the elementary calculus notions with substantial advantage to both subjects. The first year students naturally experienced some difficulty in taking up elementary calculus without previous preparation in analytic geometry or even in trigonometry, but in the latter half of the first term this handicap was generally overcome and their progress and interest were all that could be desired. The same general program will be followed during 1920-21 with the important advantage, however, of preparation in trigonometry, which has now become an entrance requirement. No satisfactory text-book being available for the elementary calculus, the instruction has been based on printed notes. There was an exceptional demand at the beginning of the year 1919-20 for special provision for men entering from other colleges without preparation in calculus and it became necessary to organize three

sections, numbering about eighty students and meeting outside regular hours.

About one-half of the total number were thereby enabled to maintain regular second-year standing.

Under the new plan for promotion of research, three members of the Department — Professors Phillips, Hitchcock and Lipka — have been relieved from one-third of their teaching assignments. The results in mathematical research and publication (as elsewhere shown) have been substantial.

The weekly department meetings during the year have been devoted alternately to scientific discussion and to matters of current work.

The statistics of the principal classes have been as follows:

	Students	Sections
In the first term:		
Trigonometry, M10 (first year)	605	26
Elementary Calculus, M11 (first year)	731	27
Integral Calculus, M21 (second year)	957	38
In the second term:		
Trigonometry, M10 (Junior Grade)	108	5
Elementary Calculus, M11 (Junior Grade)	131	5
Analytic Geometry, M12 (first year)	633	25
Integral Calculus, M21 (second year)	104	5
Calculus and Differential Equations, M22 (second year)	849	34
In the third term:		
Analytic Geometry, M12 (first year, Junior Grade)	129	5
Analytic Geometry and Calculus (first year)	638	28
Calculus and Differential Equations, M22	148	5
Applied Mathematics, M23 (second year)	572	25

In spite of the exceptional size of the second-year class, five extra sections were formed in January for first-term work and continued for second-term work until June, with special advantage to men returning late from military service.

Special classes were conducted by members of the Department as follows: Aeronautics, by Professor Moore, Mathematical Laboratory, by Professor Lipka, and Thermodynamics, by Professor Phillips.

Professors Moore and Phillips have taught sections in Physics, Professor Franklin and Mr. MacKinnon, of the latter department, taking mathematical sections in exchange, with mutual advantage.

H. W. Tyler.

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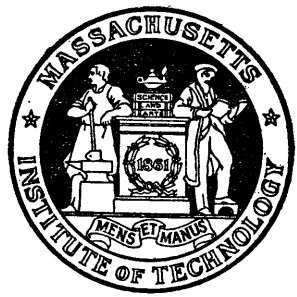
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

TREASURER'S REPORT



FOR THE YEAR ENDED JUNE 30, 1920

Treasurer's Report

To the Corporation of
the Massachusetts Institute of Technology:

The statements submitted herewith show the financial condition of the Massachusetts Institute of Technology as of June 30, 1920, as well as the financial transactions during the fiscal year ended on that date.

The following gifts and legacies have been received during the year.

Capital Gifts:

George Eastman, for Endowment Fund	$4,000,000.00	
Subscriptions to M.I.T. Educational Endowment Fund	1,540,459.50	
Alumni Fund and Income, for Equipment	77,058.33	
Estate of Maria A. Evans	70,600.00	
Estate of Charles C. Drew	64,000.00	
Estate of Norman H. George	40,000.00	
Estate of Caroline S. Freeman, for Mabel Blake Case Fund	25,000.00	
Estate of Malcolm Cotton Brown, for Fellowship	10,850.00	
Estate of Samuel C. Cobb, for Salaries	2,000.00	
Estate of Frank E. Peabody	522.22	
Estate of Thomas Gaffield	236.13	
Estate of Charles F. Atkinson	127.65	
		$5,830,853.83

Gifts for Research (Schedule **B-1**), *Minor Fund Earnings:*

Subscriptions to Technology Plan Research Fund	$8,100.00	
American Telephone and Telegraph Company, Library Fund	3,803.46	
American Telephone and Telegraph Company, Research Fund	14,763.66	
Goodyear Tire and Rubber Co. for Applied Chemistry	18,750.00	
Vacuum Oil Co., for Applied Chemistry	7,500.00	
National Tube Co., for Applied Chemistry	2,650.00	
National Electrolytic Co., for Applied Chemistry	1,193.00	
		56,760.12

Miscellaneous Gifts:

Estate of Henry L. Pierce	$4,000.00	
A. F. Bemis for Dormitory Investigation	1,191.41	
*Monsanto Chemical Works, for Scholarships	500.00	
*Estate of Frances E. Weston, for Scholarship	400.00	
F. J. Moore, for Salaries	375.00	
A. F. Bemis, for Naval Architectural Department	300.00	
A. E. Pew, Jr., for Department of Geology	200.00	
N. Krasnoff, for Student Aid	92.27	
F. H. Liggett, for General Purposes	40.00	
L. H. Fales, for Student Aid	34.00	
F. W. Climex, for General Purposes	25.00	
Howard Coonley, for Course XV Fund	25.00	
H. R. Lane, for Course XV Fund	25.00	
George B. Baker, for Course XV Fund	20.00	
R. W. Babson, for Course XV Fund	20.00	
H. S. Dennison, for Course XV Fund	20.00	
Frank E. Merrill, for General Purposes	20.00	
Everett P. Turner, for Course XV Fund	20.00	
		7,307.68
		$5,894,921.63

*Not Carried to Current Income.

Of the above total $5,894,921.63, the sum of $63,167.80 was given for current expenses or research, and has been carried in to the income for the year.

Respectfully submitted,

FRANCIS R. HART,
Treasurer.

November 1, 1920.

SCHEDULE A

FINANCIAL RESULT OF THE YEAR ENDED JUNE 30, 1920 COMPARED WITH THE PREVIOUS YEAR

	1918-1919	*1919-1920*
Current Income, Schedule B-1	$1,515,457.87	$1,684,297.13
Current Outgo, Schedule C-1	1,453,306.99	1,659,096.71
Excess of Income	$62,150.88	$25,200.42
Income transferred to Funds — net	62,498.43	58,942.59
Net Deficit	$347.55	$33,742.17

LOSSES AND GAINS DURING YEAR

Gains and credits, Schedule S	$20,422.47	$64,652.70
	$20,074.92	$30,910.53
Losses and charges, Schedule S	33,317.04	1,200.63
Decrease of Current Surplus	$13,242.12	
Increase of Current Surplus		$29,709.90

SCHEDULE B-1

INCOME

	Regular courses	*Research and funds*	*Total*
INCOME FROM STUDENTS:			
Tuition fees	$744,390.77		
Entrance examination fees forfeited	210.00		
Locker fees	1,459.30		
Sale of lecture notes, etc.	3,554.65		
Registration fees	555.00		
Dormitory rentals (Schedule C-7)	34,303.77		
Walker Memorial	15,877.21		
	$800,350.70		$800,350.70
INCOME FROM INVESTMENTS:			
Endowments for general purposes, Schedule P	$316,669.47	$534.07	
Endowments for scholarship purposes, applied	31,954.50		
Endowments for other designated purposes	36,409.35	139,717.32	
	$385,033.32	$140,251.39	
Other income not applied to funds	24,664.94		
	$409,698.26		
Less:			
Accrued interest on purchases, etc.	24,664.94		
Net, Schedule Q	$385,033.32	$140,251.39	$525,284.71
GRANTS BY NATION AND STATE:			
Annual Grant from Commonwealth of Massachusetts	$100,000.00		
Federal Aid Income from land grant,			
Act 1862	5,015.01		
Act 1890	16,666.67		
	$121,681.68		$121,681.68
GIFTS FOR			
Current Expenses	$4,085.00		$4,085.00

	Regular courses	*Research and funds*	*Total*
MINOR FUND EARNINGS:			
Total as shown in Schedule R.		$55,944.51	$55,944.51
INCOME FROM OTHER SOURCES:			
Interest	$10,854.92		
Huntington Hall, etc.	4,506.00		
U. S. Government Schools	2,615.81		
Walker Building	8,000.00		
Dining Service, Walker Memorial (Schedule C-8)	137,733.55		
Bursar's Fund reimbursements		$595.32	
Summer Camp, 1919	12,644.93		
	$176,355.21	$595.32	$176,950.53
Total income, Schedule A	$1,487,505.91	$196,791.22	$1,684,297.13

SCHEDULE C-1

OUTGO

	Regular courses	*Research and funds*	*Total*
SALARIES OF TEACHERS:			
Professors	$182,335.85	$6,458.28	
Associate Professors	80,771.70	1,656.66	
Assistant Professors	83,197.79	10,558.38	
Instructors	142,095.50	5,444.71	
Lecturers	5,132.50		
Assistants	19,278.17	26,541.81	
	$512,811.51	$50,669.84	$563,481.35
BONUS TO TEACHERS	$75,700.00		$75,700.00
WAGES ACCESSORY TO TEACHING:			
Stenographers and Assistants	15,770.12	3,303.67	19,073.79
DEPARTMENT SUPPLIES AND REPAIRS:			
(Schedule C-2):	75,413.16		75,413.16
DIVISION OF INDUSTRIAL CO-OPERATION AND RESEARCH	13,868.92		13,868.92
ADMINISTRATION AND GENERAL EXPENSE:			
Salaries of officers	40,811.29		
Salaries of assistants, stenographers, etc.	47,210.52		
Lecture notes	5,252.83		
Advertising and printing (Schedule C-3)	28,751.06		
Insurance	3,085.26		
General Expense (Schedule C-4)	127,714.57		
	$252,825.53		252,825.53
OPERATION AND MAINTENANCE OF PLANT:			
Power Plant Operation (Schedule C-5)	$149,196.78		
Building service, salaries	147,584.18	1,992.92	
Repairs (Schedule C-6)	32,378.33		
	$329,159.29	1,992.92	331,152.21
EXPENSES OF MINOR FUNDS (excluding salaries):			
Total as shown in Schedule R.		20,407.45	20,407.45
*AWARDS:			
Edward Austin Fund awards		$6,770.16	
Teachers' Fund awards		5,189.96	
Bursar's Fund awards		1,151.51	
Fellowship awards		2,750.00	
Dormitory awards (Whitney Fund)		197.50	

*Other than Undergraduate Scholarship.

	Regular courses	*Research and funds*	*Total*
AWARDS—*Continued*:			
Student Tax awards (Whitney Fund)		$3,250.50	
Architectural Prizes		600.00	
		$19,909.63	$19,909.63
PREMIUMS CHARGED OFF:			
General Investments	$5,505.94		
Rogers Memorial Investments	166.00		
Draper Fund Investments	24.00		
	$5,695.94		5,695.94
EXPENSES:			
Pratt Naval Architectural Fund		$35,039.59	
Chemical Engineering Practice Fund		1,377.68	
*Jonathan Whitney Fund		466.50	
Edna Dow Cheney Fund		266.30	
Technology Matrons' Teas Fund		89.80	
Ellen H. Richards Fund		42.36	
Cilley Fund		1,100.88	
F. W. Boles Memorial Fund		346.98	
Samuel Cabot Fund		493.96	
Charles Flint Fund		154.51	
Arthur Rotch Fund		43.22	
John Hume Tod Fund		143.34	
E. K. Turner Fund		2,000.00	
Dormitories (Schedule C-7)	$29,051.20		
Summer Camp, 1919	14,148.22		
Dining Service (Schedule C-8)	160,659.69		
Walker Memorial	20,327.05		
APPROPRIATIONS:			
Physico-Chemical Research Fund	6,817.81		
Sanitary Research Fund	2,333.01		
INTEREST PAID	5,859.34		
SOCIETY OF ARTS. Expenses	807.29		
	$240,003.61	$41,565.12	281,568.73
Total Outgo, Schedule A	$1,521,248.08	$137,848.63	$1,659,096.71

*Other than scholarship.

SCHEDULE C-2

DETAIL OF DEPARTMENT EXPENSES (Net)

	Expense		*Repairs*			
	Supplies	*Salaries and wages*	*Stock*	*Wages*	*Total*	*Overdraft*
Aeronautics	$885.03	$254.84	$24.74	$37.91	$1,202.52	.....
Architecture	2,258.56	.....	73.95	374.56	2,707.07	$125.18
Biology	1,467.85	.....	58,29	48.02	1,574.16	.....
Chemistry	8,688.50	.....	220.07	341.43	9,250.00	1,189.98
Civil Engineering, Special	1,998.12	.....	17.23	42.40	2,057.75	.....
Civil and Sanitary Engineering	1,889.70	.....	36.78	65.74	1,992.22	.....
Drawing	370.33	.....	3.08	3.44	376.85	.....
*Economics	1,907.31	185.47	1.10	9.55	2,103.43	503.64
Electrical Engineering	5,089.44	.....	569.61	615.80	6,274.85	1,145.61
Engineering Adm., Special	13.30	2,768.20	.....	.....	2,781.50	.....
English and History	486.12	.....	.....	.50	486.62	.....
General Library	3,186.68	.....	20.79	17.53	3,225.00	350.48
Geology	1,059.58	3.60	104.66	173.85	1,341.69	.....
Mathematics	509.50	540.50	.....	.....	1,050.00	71.44
Mechanical Engineering	9,227.42	.....	2,095.36	3,341.36	14,664.14	.....
Military Science	727.20	540.00	87.89	44.91	1,400.00	86.44
Mining Engineering	3,517.82	.....	188.75	293.43	4,000.00	79.75
Modern Language	241.23	177.00	.....	.....	418.23	.....
Naval Architecture	658.48	1,181.91	49.28	110.33	2,000.00	536.30
Physical Training, Gymnasium	227.50	.....	7.95	37.42	272.87	.....
Physical Training, Athletic Field	4,941.76	2,975.65	116.92	182.39	8,216.72	.....
Physics	6,940.23	.....	584.39	475.38	8,000.00	1,996.88
Physics, Special	.....	.....	13.25	4.29	17.54	.....
	$56,291.66	$8,627.17	$4,274.09	$6,220.24	$75,413.16	$6,085.70

Total, Schedule C-1	$75,413.16
Department overdrafts (Schedule D-2, Current Assets)	6,085.70

*Including Engineering Administration.

SCHEDULE C-3

DETAIL OF EXPENSE OF PRINTING AND ADVERTISING (Net)

For Administration Offices	$11,686.66
Advertising in Technology Publications and other Publicity	1,305.03
Register of Former Students	3,202.03
President's and Treasurer's Reports	1,089.30
Catalog	876.45
Courses of Study	3,498.95
Examinations	2,037.20
Circular of General Information	1,409.50
Directory of Students	1,292.50
"Summer Courses" and "Summer Camp" Circulars	604.75
Miscellaneous	1,748.69
Total, Schedule C-1	$28,751.06

SCHEDULE C-4

DETAIL OF ITEMS OF GENERAL EXPENSE (Net)

Administration Expense	$7,492.62
Buildings and Janitors' Supplies	5,694.49
Express, Freight, Telegrams, etc.	656.35
Fees, Dues, Commissions, etc.	13,719.18
Furniture and Office Equipment	1,741.83
General Office Supplies	1,133.56
Graduation Expenses, etc.	2,194.90
Grounds	9,937.91
Ice, Spring Water	2,226.92
Electric Lamps and Fixtures	1,277.68
Neostyle Service	215.53
Postage	2,850.50
Traveling Expenses	2,573.58
Telephone Service	10,089.99
Trucking	3,596.65
Laundry	1,730.05
Collection of Endowment Fund	53,302.81
Miscellaneous	7,280.02
Total, Schedule C-1	$127,714.57

SCHEDULE C-5

DETAIL OF POWER PLANT OPERATION (Net)

Coal	$103,307.62
Water	4,622.10
Gas	2,216.69
Power Plant and Boiler Room Supplies	12,985.00
Repairs	6,284.53
Trucking	241.73
Salaries	24,423.61
Miscellaneous	71.97
	$154,153.25
Less Sales of Electricity	4,956.47
Total Schedule C-1	$149,196.78

SCHEDULE C-6

DETAIL OF PLANT REPAIRS (Net)

Rogers Building, Boston	$4,666.05	
President's House	1,167.05	
General Educational Building, Group No. 1	3,756.94	
General Educational Building, Group No. 2	2,067.62	
General Educational Building, Group No. 3	5,839.04	
General Educational Building, Group No. 4	3,638.07	
General Educational Building, Group No. 8	2,552.48	
General Educational Building, Group No. 10	2,157.08	
Gas Engine Laboratory	215.47	
General Furniture Repairs	694.22	
Elevators	623.37	
Shop Maintenance	2,536.73	
Mechanics Arts Building	2,418.06	
Undistributed	46.15	
Total, Schedule C-1		$32,378.33

SCHEDULE C-7

DORMITORY ACCOUNT (Net)

Income:

Cash	$35,068.98	
Less Rental Refunds	765.21	
Total Income (Schedule B-1)		$34,303.77

Expense:

Salaries	$9,548.05	
Laundry	836.45	
Heat	3,841.75	
Light and Power	1,300.00	
Water	1,212.25	
Repairs	3,396.44	
Supplies	1,658.59	
Insurance	300.00	
Trucking, etc.	76.83	
Printing, etc.	130.84	
Interest on Mortgage Loan (Whitney Fund)	6,750.00	
Total Expense (Schedule C-1)		29,051.20
Net Income for year		$5,252.57

SCHEDULE C-8

DINING SERVICE ACCOUNT (Net)

Income:

Cash, Dining Room	$128,289.61	
Cigars and Candy	9,443.94	
Net Income (Schedule B-1)		$137,733.55

Expenditures:

Food	$78,625.00	
Cigars and Candy	9,156.01	
Salaries	50,968.05	
Light, Heat, Power, etc.	3,490.55	
Laundry	2,781.21	
Printing and Advertising	358.50	
Flowers, Music	543.00	
Ice, Refrigeration, etc.	2,571.25	
Repairs, Telephone, Trucking	3,663.87	
Administration Expense	356.89	
Dining-room and Kitchen Equipment	5,589.63	
Soap, Cleansers, etc.	788.07	
Insurance	366.00	
Miscellaneous	1,401.66	
Net Expense (Schedule C-1)		160,659.69
Net loss for year		$22,926.14

SCHEDULE D

TREASURER'S BALANCE SHEET

1

INVESTMENT ASSETS

Securities and Real Estate, Schedule H	$14,131,409.54
Cash: In banks for Investment, Schedule E	241,021.44
Cash: Advanced (carried down per contra)	557,772.80
Total	$14,930,203.78

2

CURRENT ASSETS

Cash available for general purposes, Schedule E	$298,085.16
Accounts Receivable Schedule D-1	43,296.40
Student Fees Receivable	2,344.81
Student Deposits Receivable	1,300.94
Unexpired Insurance	16,319.06
Inventories and Advances for 1920-21, Schedule D-2	142,076.68
Total	$503,423.05

3

EDUCATIONAL PLANT ASSETS

Lands, Buildings and Equipment. Book Values

Total book value at beginning of year (net)	$10,493,540.18
Additions during year	299,218.14
Total Book Value at end of year, Schedule J	$10,792,758.32

SCHEDULE D

JUNE 30, 1920

1

ENDOWMENT AND OTHER FUNDS

Funds, Schedule Q recapitulation	$14,914,108.61
Minor Funds, Schedule R	16,095.17
Total Funds	$14,930,203.78

2

CURRENT LIABILITIES

Borrowed from Investment Assets	$332,449.26
Accounts Payable	21,570.87
Tuition in advance, 1920-21	24,592.00
Summer Camp, 1920, Fees and Deposits	1,845.90
Summer Camp, Outside Students' Fees	500.00
Entrance Examination Fees	975.00
Students' Deposits payable	8,237.57
Dormitories, Income in advance	2,766.37
Students' deposits in advance, 1920-21	6,415.50
*Student Tax, Unexpended Balance	3,239.45
Deposit due Knights of Columbus	4,473.26
Deposits for Military Equipment	1,918.64
Total	$408,983.82
Surplus available for current expense, Schedule S	94,439.23
Total	$503,423.05

3

EDUCATIONAL PLANT AND CAPITAL ACCOUNTS

Endowment for Educational Plant, Schedule K-1	$10,417,434.78
Mortgage Loan, Dormitories	150,000.00
Borrowed from Investment Assets	225,323.54
Total	$10,792,758.32

*$350.00 Student Tax Funds, invested in U. S Liberty Bonds, not included in this amount.

SCHEDULE D-1

DETAIL OF ACCOUNTS RECEIVABLE

United States Naval Academy	$11,250.00
Goodyear Tire and Rubber Co.	4,840.54
Lowell School for Industrial Foremen	3,117.85
United States War Department—Special Research	2,637.67
Federal Board for Vocational Education	5,121.31
M. I. T. Alumni Association	2,441.24
Miscellaneous Accounts	13,887.79
Total, Schedule D	$43,296.40

SCHEDULE D-2

DETAIL OF INVENTORIES AND ADVANCES FOR 1920-1921

Advanced to Summer Camp, 1920	$6,089.23
Departmental Overdrafts	6,085.70
Inventories—Dining Room	45,760.06
Walker Memorial, Games	264.08
Building and Janitors' Supplies	5,504.88
Office Supplies	3,025.20
Photostat Equipment	1,067.35
Electrical Equipment	5,418.13
Pipe, Valves, Fittings, etc.	13,900.37
Lumber, Hardware, etc.	2,081.27
Shades, Locks, etc.	1,802.94
Paint, Glass, etc.	1,077.47
Division of Laboratory Supplies (Estimated)	50,000.00
Total, Schedule D	$142,076.68

SCHEDULE E

CASH RECEIPTS AND DISBURSEMENTS

FOR THE YEAR

Total Cash Receipts (less transfers)	$3,552,981.06
Total Cash Disbursements (less transfers)	3,308,786.33
Excess of Receipts	$244,194.73
Cash balance at beginning of year	294,911.87
Cash balance at end of year	$539,106.60

CASH BALANCE

Cash on deposit at banks:		
For Investment		$241,021.44
For General Purposes	$295,332.28	
Cash at office:		298,085.16
For General Purposes	2,752.88	
Cash balance as above		$539,106.60

SCHEDULE H

SECURITIES: BONDS, STOCKS.

Bonds	*Description of securities*	*Due*	*Balance at beginning of year*
$115,000.00	Am. Tel. & Tel. Co. 4%	1929	$114,025.00
75,000.00	Am. Thread Co. 6%	1928	.....
50,000.00	Am. Tobacco Co. 7%	1923	.....
75,000.00	Atch., Topeka & Santa Fe R.R. Co. 4%	1995	72,000.00
75,000.00	Atch., Topeka & Santa Fe R.R. Co. 4½%	1962	73,143.75
94,000.00	Baltimore & Ohio R.R. Co. 3½%	1925	86,490.00
500.00	Beaumont Gas Light Co. 6%	1944	.....
	Beverly, City of, 4%	1919	1,000.00
50,000.00	Blackstone Valley Gas & Elec. Co. 5%	1939	50,206.00
	Boston & Northern St. Ry. Co. 4%	1954	9,250.00
70,000.00	Brooklyn Rapid Transit Co. 7%	1921	70,000.00
50.00	Canada, Dominion of, 5½%	1934	.....
200.00	Canada, Dominion of, 5½%	1937	.....
50,000.00	Central Pacific Ry. Co. 4%	1954	40,918.75
93,000.00	Chesapeake & Ohio Ry. Co. 5%	1939	99,581.00
25,000.00	Chesapeake & Potomac Tel. Co. 5%	1943	24,500.00
48,000.00	Chicago, Burlington & Quincy R.R.4%	1958	47,307.00
16,000.00	Chicago, Ill., City of, 4%	1930	16,189.00
50,000.00	Chicago City Railway 5%	1927	49,750.00
50,000.00	Chi. Junc. Rys. and Union Stock Yds. 4%	1940	49,250.00
35,000.00	Chi. Junc. Rys. and Union Stock Yds. 5%	1940	34,743.75
25,000.00	Chi. Mil. & St. Paul Ry. Co. 4%	1934	23,406.25
55,000.00	Chi. Mil. & St. Paul Ry. Co. 5%	2014	56,076.00
100,000.00	Chicago & Northwestern Ry. Co. 4%	1987	96,500.00
65,000.00	Chicago Union Station 4½%	1963	65,457.00
1,500.00	Cincinnati, City of, 4½%	1935	1,616.00
50,000.00	Cincinnati, City of, 4¼%	1936	52,630.00
6,500.00	Cincinnati, City of, 4½%	1945	7,198.00
1,000.00	Cincinnati, City of, 4½%	1933	1,025.00
100,000.00	Cleveland Elec. Ill. Co. 5%	1939	101,822.00
25,000.00	Cleveland & Pittsburgh R.R. Co. 4½%	1942	25,654.00
100,000.00	Columbus, Ohio, City of, 4½%	1944	108,210.00
68,000.00	Cons. Gas, Elec. Light & Power 4½%	1935	63,630.00
50,000.00	Consumers Power Co. 5%	1936	50,000.00
100.00	Cont. Gas & Elec. Corp. 5%	1927	.....
51,000.00	Cumberland Tel & Tel. Co. 5%	1937	50,305.75
17,000.00	Delaware & Hudson Co. 4%	1943	17,230.00
100,000.00	Delaware & Hudson Co. 5%	1935	105,557.00
25,000.00	Detroit Edison Co. 5%	1933	25,415.00
50,000.00	Detroit Edison Co. 5%	1940	50,110.00
1,750.00	Eastern Mass. St. Ry. Co. 6%	1925	.....
35,000.00	Eastern Mass. St. Ry Co. 4½%	1948	.....
100,000.00	Edison Electric Ill. Co. 5%	1922	100,888.00
17,000.00	Electrical Securities Corp. 5%	1940	16,830.00
1,000.00	Electrical Securities Corp. 5%	1942	990.00
25,000.00	Electrical Securities Corp. 5%	1943	25,000.00
25,000.00	Empire Gas & Elec. Co. 5%	1941	.....
5,000.00	Empire Gas & Fuel Co. 6%	1926	.....
1,000.00	Franklin, Town of, 4%	1921	1,000.00
112,000.00	General Electric Co. 6%	1940	.....
63,000.00	General Electric Co. 5%	1952	65,016.00

SCHEDULE H

REAL ESTATE AND MORTGAGES

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	.....	$114,025.00	.....	$4,600.00
$102,010.00	$28,510.00	73,500.00	$1,018.34	2,265.67
51,125.00	375.00	50,750.00	1,059.72	1,750.00
.....	.....	72,000.00	.....	3,000.00
.....	.....	73,143.75	.....	3,375.00
.....	.....	86,490.00	.....	3,290.00
500.00	.....	500.00	.....	15.00
.....	1,000.00	.....	.....	20.00
.....	11.00	50,195.00	.....	2,500.00
750.00	10,000.00	.....	.....	852.50
.....	.....	70,000.00	.....	.....
50.00	.....	50.00	.....	1.26
200.00	.....	200.00	.....	.....
.....	.....	40,918.75	.....	2,000.00
.....	347.00	99,234.00	.....	4,650.00
.....	.....	24,500.00	.....	1,250.00
.....	.....	47,307.00	.....	1,920.00
.....	18.00	16,171.00	.....	640.00
.....	.....	49,750.00	.....	2,500.00
.....	.....	49,250.00	.....	2,000.00
.....	.....	34,743.75	.....	1,750.00
.....	.....	23,406.25	.....	1,000.00
.....	11.00	56,065.00	.....	2,750.00
.....	.....	96,500.00	.....	4,000.00
.....	10.00	65,447.00	.....	2,925.00
.....	7.00	1,609.00	.....	67.50
.....	165.00	52,465.00	.....	2,125.00
.....	28.00	7,170.00	.....	292.50
.....	2.00	1,023.00	.....	45.00
.....	96.00	101,726.00	.....	5,000.00
.....	30.00	25,624.00	.....	1,125.00
.....	342.00	107,868.00	.....	4,500.00
.....	.....	63,630.00	.....	3,060.00
.....	.....	50,000.00	.....	2,500.00
100.00	.....	100.00	.....	.....
.....	.....	50,305.75	.....	2,550.00
.....	10.00	17,220.00	.....	680.00
.....	370.00	105,187.00	.....	5,000.00
.....	15.00	25,400.00	.....	1,250.00
.....	5.00	50,105.00	.....	2,500.00
1,750.00	.....	1,750.00	.....	.....
35,000.00	.....	35,000.00	.....	.....
.....	444.00	100,444.00	.....	5,000.00
.....	.....	16,830.00	.....	850.00
.....	.....	990.00	.....	50.00
.....	.....	25,000.00	.....	1,250 00
18,250.00	.....	18,250.00	399.30	625.00
4,475.00	.....	4,475.00	10.84	.....
.....	.....	1,000.00	.....	40.00
105,840.00	.....	105,840.00	317.41	.....
.....	63.00	64,953.00	.....	3,150.00

Schedule H. (*Continued*)

Bonds	*Description of securities*	*Due*	*Balance at beginning of year*
$47,000.00	Georgia Ry. & Electric Co. 5%	1932	$47,852.00
100.00	Georgia and Southern Utilities 6%	1932	
1,000.00	Georgia and Southern Utilities 7%	1920	.....
85,000.00	Great Britain and Ireland 5½%	1937	86,331.44
	Greenfield, Town of, 4%	1919	750.00
68,000.00	Illinois Central R.R. Co. 4%	1951	62,817.50
75,000.00	Illinois Central R.R. Co. 4%	1952	90,500.00
7,000.00	Illinois Gas Co. 6%	1933	.....
25,000.00	Indianapolis Union Ry. Co. 5%	1965	24,906.25
50,000.00	Interboro Rapid Trans. Co. 5%	1966	49,562.50
5,000.00	Intermountain Ry. Lt. & Pr. Co. 6%	1921	.....
5,000.00	Intermountain Ry. Lt. & Pr. Co. 6%	1921	.....
2,000.00	Iowa Falls Elec. Co. 6%	1922	.....
50,000.00	Kansas City, Mo., 4½%	1935	53,564.00
7,000.00	Kan. City, Clinton & Spfd. Ry. Co. 5%	1925	6,289.21
50,000.00	Kan. City, Ft. Scott & Mem. R.R. 6%	1928	52,905.00
8,500.00	Kan. City, Mem. & Birming. R.R. 4%	1934	8,287.50
37,000.00	Kan. City, Mem. & Birming. R.R. 5%	1934	34,225.00
50,000.00	Kan. City Terminal 4%	1960	44,187.50
18,000.00	Kentucky Central Ry. Co. 4%	1987	17,910.00
85,000.00	Lake Shore & Mich. So. Ry. Co. 4%	1931	84,087.50
7,000.00	Laurentide Power Co., Ltd., 5%	1946	.....
100,000.00	Long Island R.R. Co. 4%	1949	96,137.50
50,000.00	Los Angeles, City of, 4½%	1942	52,813.00
25,000.00	Los Angeles, City of, 4½%	1943	26,074.00
75,000.00	Maine Central Ry. Co. 4½%	1935	75,078.00
100,000.00	Massachusetts Gas Cos. 4½%	1931	96,812.50
5,000.00	Mattagami Pulp & Paper Co., Ltd. 6%	1937	.....
66,000.00	Milwaukee Gas Light Co. 4%	1927	61,932.50
100,000.00	Milwaukee County 4½%	1927/32	104,169.00
50,000.00	Minneapolis Gen. Elec. Co. 5%	1934	50,415.00
100,000.00	Minn., St. Paul & Sault St. Marie 4%	1938	93,425.00
25,000.00	Mississippi River Power Co. 5%	1951	.....
21,000.00	Missouri & Ill. Bridge & Belt R.R.Co. 4%	1951	.....
25,000.00	Montreal, City of, Canada 5%	1936	50,000.00
50,000.00	New England Tel & Tel. Co. 4%	1930	50,217.00
50,000.00	New England Tel. & Tel. Co. 5%	1932	50,797.00
52,000.00	N. Y. C. & H. R.R. Co. 4%	1998	46,046.65
	N. Y. C. Lines Equipment 5%	1919	34,740.00
14,000.00	New York Central R.R. 6%	1935	.....
40,000.00	New York City 4¼%	1964	41,654.00
5,000.00	New York City 4½%	1967	.....
100,000.00	N. Y. Connecting R.R. Co. 4½%	1953	98,625.00
31,000.00	N. Y., N. H. & H. R.R. Co. 6%	1948	34,331.00
55,000.00	N. Y. Telephone Co. 4½%	1939	53,130.86
33,000.00	Norfolk, Va., City of, 4%	1954	33,000.00
159,000.00	Northern Pacific Gt. No. R.R. Co. 4%	1921	155,437.50
75,000.00	Northern Pacific Ry. Co. 4%	1997	67,875.00
	Norton Company 5%	1922	50,000.00
	Old Colony St. Ry. Co. 4%	1954	22,750.00
50,000.00	Omaha, Neb., City of, 4½%	1934	53,309.00
50,000.00	Omaha, Neb., City of, 4½%	1941	54,157.00

Schedule H. (*Continued*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	$71.00	$47,781.00	.....	$2,350.00
$100.00	.....	100.00	.....	.....
1,000.00	.....	1,000.00	.....	35.00
.....	78.44	86,253.00	.....	4,675.00
.....	750.00	.....	.....	15.00
.....	.....	62,817.50	.....	2,720.00
.....	22,625.00	67,875.00	.....	3,000.00
5,460.00	.....	5,460.00	$204.17	210.00
.....	.....	24,906.25	.....	1,250.00
.....	.....	49,562.50	.....	2,500.00
4,968.00	.....	4,968.00	95.00	.....
4,964.00	.....	4,964.00	70.00	.....
1,959.00	.....	1,959.00	28.00	.....
.....	237.00	53,327.00	.....	2,250.00
.....	.....	6,289.21	.....	350.00
.....	362.00	52,543.00	.....	3,000.00
.....	.....	8,287.50	.....	340.00
.....	.....	34,225.00	.....	1,850.00
.....	.....	44,187.50	.....	2,000.00
.....	.....	17,910.00	.....	720.00
.....	.....	84,087.50	.....	3,400.00
5,740.00	.....	5,740.00	170.14	175.00
.....	.....	96,137.50	.....	4,000.00
.....	128.00	52,685.00	.....	2,250.00
.....	48.00	26,026.00	.....	1,125.00
.....	5.00	75,073.00	.....	3,375.00
.....	.....	96,812.50	.....	4,500.00
4,000.00	.....	4,000.00	45.83	150.00
.....	.....	61,932.50	.....	2,640.00
.....	419.00	103,750.00	.....	4,500.00
.....	30.00	50,385.00	.....	2,500.00
.....	.....	93,425.00	.....	4,000.00
18,531.25	.....	18,531.25	156.25	.....
13,650.00	.....	13,650.00	.....	.....
.....	25,000.00	25,000.00	.....	1,250.00
.....	21.00	50,196.00	.....	2,000.00
.....	66.00	50,731.00	.....	2,500.00
.....	.....	46,046.65	.....	2,080.00
1,260.00	36,000.00	.....	.....	900.00
12,180.00	.....	12,180.00	30.34	.....
.....	37.00	41,617.00	.....	1,700.00
4,625.00	.....	4,625.00	83.13	.....
.....	.....	98,625.00	.....	4,500.00
.....	119.00	34,212.00	.....	1,860.00
.....	.....	53,130.86	.....	2,475.00
.....	.....	33,000.00	.....	1,320.00
.....	.....	155,437.50	.....	6,360.00
.....	.....	67,875.00	.....	3,000.00
1,000.00	51,000.00	.....	.....	1,250.00
2,250.00	25,000.00	.....	.....	2,131.25
.....	236.00	53,073.00	.....	2,250.00
.....	198.00	53,959.00	.....	2,250.00

Schedule H. (*Continued*)

Bonds, shares	*Description of securities*	*Due*	*Balance at beginning of year*
$50,000.00	Province of Ontario 5%	1926	$50,000.00
84,000.00	Oregon R.R. & Navigation Co. 4%	1946	82,668.25
50,000.00	Oregon Short Line R.R Co. 4%	1929	48,500.00
14,500,00	Oregon Short Line R.R Co. 5%	1946	15,271.00
41,000.00	Ottawa, P. Q., City of, 4½%	1930	39,003.30
75,000.00	Pacific Tel. & Tel. Co. 5%	1937	73,915.10
18,000.00	Pennsylvania R.R. Co. 4½%	1960	18,600.00
100,000.00	Pennsylvania R.R. Co. 4½%	1965	101,052.00
117,900.00	Pere Marquette R.R. Co. 5%	1956	104,719.59
50,000.00	Philadelphia, City of, 4%	1947	51,576.00
25,000.00	Portland General Electric Co. 5%	1935	25,409.00
50,000.00	Portland, Ore., City of, 4½%	1945	50,864.00
	Quebec, City of, 5%	1920	49,375.00
1,000.00	Quincy Market Realty Co. 5%	1964	1,000.00
51,000.00	Rio Grande Western Ry. Co. 4%	1939	49,935.00
40,000.00	Salt Lake City, Utah, 4½%	1934	41,699.00
15,000.00	San Francisco, City of, 5%	1937	16,172.00
10,000.00	San Francisco, City of, 5%	1939	10,838.00
100,000.00	Savannah, Ga., City of, 4½%	1934-40	105,621.00
19,000.00	Seattle Electric Co. 5%	1929	18,430.00
1,000.00	Somerset Ry. Co. 4%	1955	850.00
100,000.00	Southern Bell Tel. & Tel. 5%	1941	101,257.00
45,000.00	Southern Calif. Edison Co. 5%	1939	44,550.00
25,000.00	Southern Ry. Co. 4%	1951	24,875.00
5,000.00	Southern Utilities Co. 6%	1933	.....
50,000.00	St. Paul, City of, 4¼%	1936	52,053.00
25,000.00	Swift & Co. 5%	1944	.....
100.00	Toledo Terminal R.R. Co. 4½%	1957	75.00
100,000.00	Terminal R.R. Assn. of St. Louis 4½%	1939	100,324.00
25,000.00	Terre Haute Traction & Light Co. 5%	1944	25,000.00
50,000.00	Toronto, City of, 5%	1932	50,000.00
50,000.00	Trinity Buildings Corp. of N. Y. 5½%	1939	.....
100,000.00	Turner's Falls Power & Electric Co. 7%	1925	.....
100,000.00	Union Pacific R.R. Co. 4%	1947	101,024.00
8,000.00	United Gas & Elec. Corp. 6%	1945	.....
619,500.00	U. S. A. Liberty and Victory Loans (All Issues)		549,200.00
94,000.00	U. S. Steel Corp. 5%	1963	102,978.00
1,000.00	Washington Co. R.R. Co. 3½%	1954	750.00
75,000.00	Western Tel. & Tel. Co. 5%	1932	101,410.00
25,000.00	Western Electric Co. 5%	1922	24,875.00
10,000.00	Western Pacific R.R Co. 5%	1946	.....
40,000.00	Winnipeg, Man., City of, 5%	1926	39,350.00
50,000.00	Winston-Salem Southbound Ry. 4%	1960	43,875.00
588 shares	Alaska Building Trust		58,800.00
75 "	American Bosch Magneto Corp.		.....
50 "	American Tel. & Tel. Co.		6,113.12
80 "	Amoskeag Mfg. Co. Pfd.		7,890.00
92 "	Amoskeag Mfg. Co. Com		3,266.00
141 "	Batopilas Mining Co.		141.00
500 "	Baldwin Locomotive Works, Com.		.....
5 "	Booth Fisheries Co., 1st Pfd.		.....
295 "	Boston & Albany R.R. Co.		60,911.50

Schedule H. (*Continued*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	.....	$50,000.00	.....	$2,500.00
.....	.....	82,668.25	.....	3,360.00
.....	.....	48,500.00	.....	2,000.00
.....	30.00	15,241.00	.....	725.00
.....	.....	39,003.30	.....	1,845.00
.....	.....	73,915.10	.....	3,750.00
.....	15.00	18,585.00	.....	810.00
.....	23.00	101,029.00	.....	4,500.00
.....	.....	104,719.59	.....	5,895.00
.....	58.00	51,518.00	.....	2,000.00
.....	27.00	25,382.00	.....	1,250.00
.....	34.00	50,830.00	.....	2,250.00
$625.00	50,000.00	.....	.....	2,500.00
.....	.....	1,000.00	.....	50.00
.....	.....	49,935.00	.....	2,040.00
.....	121.00	41,578.00	.....	1,800.00
.....	69.00	16,103.00	.....	750.00
.....	44.00	10,794.00	.....	500.00
.....	353.00	105,268.00	.....	4,500.00
.....	.....	18,430.00	.....	950.00
.....	.....	850.00	.....	40.00
.....	60.00	101,197.00	.....	5,000.00
.....	.....	44,550.00	.....	2,250.00
.....	.....	24,875.00	.....	1,000.00
3,900.00	.....	3,900.00	$70.83	150.00
.....	128.00	51,925.00	.....	2,125.00
22,625.00	.....	22,625.00	163.19	.....
.....	.....	75.00	.....	4.50
.....	17.00	100,307.00	.....	4,500.00
.....	.....	25,000.00	.....	1,250.00
.....	.....	50,000.00	.....	2,500.00
49,250.00	.....	49,250.00	640.72	1,375.00
100,000.00	.....	100,000.00	213.89	.....
.....	38.00	100,986.00	.....	4,000.00
4,240.00	.....	4,240.00	113.34	240.00
70,300.00	.....	619,500.00	.....	25,718.69
.....	4,414.00	98,564.00	.....	4,900.00
.....	.....	750.00	.....	35.00
.....	25,633.00	75,777.00	.....	3,750.00
.....	.....	24,875.00	.....	1,250.00
8,000.00	.....	8,000.00	159.72	250.00
.....	.....	39,350.00	.....	2,000.00
.....	.....	43,875.00	.....	2,000.00
.....	.....	58,800.00	.....	3,528.00
9,225.00	.....	9,225 00	.....	187.50
.....	.....	6,113.12	.....	400.00
.....	.....	7,890.00	.....	360.00
.....	.....	3,266.00	.....	310.50
.....	.....	141.00	.....	.....
55,000.00	.....	55,000.00	.....	.....
315.00	.....	315.00	.....	.....
.....	.....	60,911.50	.....	3,318.75

Schedule H. (*Continued*)

Shares	*Description of securities*	*Balance at beginning of year*
152 shares	Boston & Maine R.R. Co. 1st Pfd.	.....
10 "	Boston Elevated Ry. Co. Com	.....
5 "	Boston Elevated Ry. Co., Pfd.	.....
68 "	Boston Real Estate Trust	$71,661.64
41 "	Boston Woven Hose & Rubber Co. Com.	5,812.50
20 "	Boston Woven Hose & Rubber Co. Pfd.	2,340.00
91 "	Central Wharf & Wet Dock Corp.	18,900.00
93 "	Chi., Milwaukee & St. Paul Ry. Co. Pfd.	7,367.00
33 "	Chi., Milwaukee & St. Paul Ry. Co. Com	3,168.00
29 "	Chicago & Northwestern Ry. Co. Com	3,733.75
40 "	Congress St. Associates	3,880.00
2 '	Co-operative Publishing Co.	2.00
2 "	Dallas Elec. Co. 1st Pfd.	.....
2 "	E. I. du Pont de Nemours Co. Com.	.....
500 "	Eastern Mfg. Co. Pfd. 7%	.....
	Electric Holdings Co. Ltd.	600.00
27 "	Essex Co.	3,780.00
	Fitchburg R.R. Co. Pfd.	11,699.00
37 "	Fulton Iron Works, Com.	.....
100 "	Goodyear Tire & Rubber Co. Pfd.	.....
31 "	Great Falls Mfg. Co.	3,472.00
56 "	Hamilton Woolen Co.	5,390.00
40 "	Hood Rubber Co.	4,720.00
18 "	Illinois Central R.R. Co.	1,890.00
83 "	Lancaster Mills	5,519.00
101 "	Maine Central R.R. Co.	9,740.00
44 "	Nashua Mfg. Co. Pfd.	.....
500 "	Nashua Mfg. Co. Com	32,500.00
3 "	National Grand Bank of Marblehead	324.00
36 "	New Eng. Tel. & Tel. Co.	4,682.97
65 "	N. Y. C. and H. R. R.R. Co.	5,760.63
55 "	N. Y., N. H. & H. R.R. Co.	3,725.00
1 "	Northern Texas Elec. Co.	.....
500 "	Norton Co. Pfd. 7%	.....
50 "	Ohio Cities Gas Co. Com	.....
54 "	Old Colony R.R.	7,290.00
77 "	Pepperell Mfg. Co.	6,845.50
63 "	Plymouth Cordage Co.	11,970.00
50 "	Pray Building Trust	2,500.00
197 "	Pullman Co.	31,520.00
10 "	Public Service Co. No. Ills., Com	.....
7½ "	Read Coddington Co.	.....
11 "	Rivett Lathe and Grinder Co. Pfd.	935.00
3 "	Rivett Lathe and Grinder Co. Com	105.00
50 "	Samson Cordage Co.	5,000.00
500 "	Sanford Mills Pfd. 7%	.....
30 "	Somerset Hotel Trust	.....
25 "	South Terminal Trust	2,000.00
50 "	Swift Compania Internacional	.....
2 "	Tampa Elec. Co.	.....
70 "	Union Carbide & Carbon Corp.	.....
50 "	Union Mills, Inc.	.....

Schedule H. (*Continued*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
$11,699.00	.....	$11,699.00	.....	.....
640.00	.....	640.00	.....	.....
425.00	.....	425.00	.....	.....
.....	.....	71,661.64	.....	$2,720.00
1,000.00	$30.98	6,781.52	.....	402.00
.....	.....	2,340.00	.....	120.00
.....	.....	18,900.00	.....	728.00
.....	.....	7,367.00	.....	.....
.....	.....	3,168.00	.....	.....
.....	.....	3,733.75	.....	152.25
.....	.....	3,880.00	.....	120.00
.....	.....	2.00	.....	.....
114.00	.....	114.00	.....	.....
750.00	13.86	736.14	.....	13.00
49,000.00	.....	49,000.00	$229.03	875.00
311.89	911.89	.....	.....	15.80
.....	.....	3,780.00	.....	297.00
.....	11,699.00	.....	.....	418.00
3,034.00	.....	3,034.00	.....	37.00
10,000.00	.....	10,000.00	.....	175.00
.....	379.47	3,092.53	.....	372.00
.....	.....	5,390.00	.....	504.00
.....	.....	4,720.00	.....	280.00
.....	.....	1,890.00	.....	126.00
4,125.00	1.36	9,642.64	.....	665.00
.....	.....	9,740.00	.....	606.00
4,400.00	.....	4,400.00	11.98	.....
.....	4,588.49	27,911.51	.....	4,500.00
.....	.....	324.00	.....	24.00
.....	.....	4,682.97	.....	252.00
.....	.....	5,760.63	.....	325.00
145.00	.....	3,870.00	.....	.....
66.00	.....	66.00	.....	.....
50,000.00	.....	50,000.00	145.83	2,270.83
2,375.00	.....	2,375.00	.....	100.00
.....	.....	7,290.00	.....	378.00
.....	.....	6,845.50	.....	924.00
.....	.....	11,970.00	.....	1,008.00
.....	.....	2,500.00	.....	50.00
.....	.....	31,520.00	.....	1,576.00
830.00	.....	830.00	.....	35.00
915.00	.....	915.00	.....	.....
.....	.....	935.00	.....	66.00
.....	.....	105.00	.....	22.50
.....	.....	5,000.00	.....	600.00
50,000.00	.....	50,000.00	106.95	875.00
1,500.00	.....	1,500.00	.....	.....
.....	.....	2,000.00	.....	62.50
2,650.00	.....	2,650.00	.....	72.00
220.00	.....	220.00	.....	.....
5,040.00	.....	5,040.00	.....	.....
2,500.00	.....	2,500.00	.....	100.00

Schedule H. (*Continued*)

Shares	*Description of securities*	*Due*	*Balance at beginning of year*
20 shares	Union Pacific R.R. Co. Com		$2,635.00
800 "	United Fruit Co.		38,362.50
500 "	U. S. Steel Corp. Pfd.		.....
70 "	Vermont & Massachusetts R.R. Co.		8,680.00
6 "	Western Real Est. Trust		750.00
188 "	Westinghouse Elec. & Mfg. Co. Com.		9,106.54
100 "	Westinghouse Elec. & Mfg. Co. Pfd.		6,393.90
500 "	Winnsboro Mills, Pfd. 7%		.....
MORTGAGE NOTES:			
	E. V. & C. T. Bigelow 5%		4,500.00
	W. H. Partridge 5%		7,000.00
	Samuel Carr et al. Trustees 6% (face $125,000)		75,000.00
	Park Square Real Estate Trust Co. 4%		250,000.00
REAL ESTATE:			
	Avon Street Land and Buildings, Equity		60,732.55
	Newbury Street Land and Buildings, Equity		61,763.29
	Franklin Street Land and Buildings, Equity		51,072.03
	Dorchester, Land and Buildings, Equity		.....
			$7,476,066.82
INVESTMENTS, W. B. ROGERS MEMORIAL FUND:			
$25,000.00	Atchison, Top. & St. Fe Ry. Co. 4%	1995	$24,470.00
6,000.00	Baltimore & Ohio R.R. Co. 3½%	1925	5,310.00
7,000.00	Chesapeake & Ohio Ry. Co. 5%	1939	7,606.00
1,000.00	Chi., Burl. & Quincy R.R. 4%	1958	1,000.00
40,000.00	Chi. Junc. Rys. & U. Stock Yds. Co. 5%	1940	39,400.00
	Cin., Ind., St. Louis & Chi. Ry. 6%	1920	4,000.00
35,000,00	Fort St. Union Depot Co. 4½%	1941	34,825.00
31,000.00	N. Y. C. & H. R. R.R. 4%	1934	30,225.00
	Central Lines Equipment 5%	1919	965.00
37,500.00	Pere Marquette Ry. Co. 4%	1956	37,500.00
24,000.00	Rome, Watertown & Ogdensburg R.R. 5%	1922	24,265.00
4,000.00	United Electric Securities Co. 5%	1940	4,028.00
			$213,594.00
INVESTMENTS, EBEN S. DRAPER FUND:			
$20,000.00	Chi., Mil. & St. Paul Ry. Co. 5%	2014	$20,380.00
16,000.00	Georgia Ry. & Elec. Co. 5%	1932	16,220.00
24,000.00	Indianapolis Union Ry. Co. 5%	1965	23,880.00
20,000.00	New York Tel. Co. 4½%	1939	19,395.00
20,000.00	Wilmington City Elec. Co. 5%	1951	19,600.00
			$99,475.00
INVESTMENTS, THOMAS WENDELL BAILEY FUND:			
5 shares	Swift International Compania		$75.00
5 "	Libby, McNeil & Libby		50.00
	Miscellaneous Oklahoma Properties		352.00
			$477.00

Schedule H. (*Continued*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	.....	$2,635.00	.....	$200.00
$89,000.00	.....	127,362.50	.....	4,650.00
55,162.50	.....	55,162.50	.....	875.00
.....	.....	8,680.00	.....	420.00
.....	.....	750.00	.....	42.00
.....	.....	9,106.54	.....	752.00
.....	.....	6,393.90	.....	400.00
51,000.00	.....	51,000.00	$398.61	875.00
.....	.....	4,500.00	.....	225.00
.....	.....	7,000.00	.....	350.00
.....	.....	75,000.00	.....	4,500.00
.....	.....	250,000.00	.....	10,000.00
17,892.35	$2,892.35	75,732.55	8,676.94	4,073.12
.....	.....	61,763.29	6,142.27	6,352.10
2,292.50	.....	53,364.53	3,294.22	3,329.91
200.00	.....	200.00	.....	.....
$1,142,504.49	$305,870.84	$8,312,700.47	$24,055.99	$363,749.63
.....	.....	$24,470.00	.....	$1,000.00
.....	.....	5,310.00	.....	210.00
.....	$31.00	7,575.00	.....	350.00
.....	.....	1,000.00	.....	40.00
.....	.....	39,400.00	.....	2,000.00
.....	4,000.00	.....	.....	240.00
.....	.....	34,825.00	.....	1,575.00
.....	.....	30,225.00	.....	1,240.00
$35.00	1,000.00	.....	.....	25.00
.....	.....	37,500.00	.....	1,500.00
.....	133.00	24,132.00	.....	1,200.00
.....	2.00	4,026.00	.....	200.00
$35.00	$5,166.00	$208,463.00	.....	$9,580.00
.....	$4.00	$20,376.00	.....	$1,000.00
.....	20.00	16,200.00	.....	800.00
.....	.....	23,880.00	.....	1,200.00
.....	.....	19,395.00	.....	900.00
.....	.....	19,600.00	.....	1,000.00
.....	$24.00	$99,451.00	.....	$4,900.00
.....	.....	$75.00	.....	$10.00
.....	$12.94	37.06	.....	5.00
.....	.....	352.00	.....	.....
.....	$12.94	$464.06	.....	$15.00

Schedule H. (*Continued*)

		Due	Balance at beginning of year
INVESTMENTS, GEORGE EASTMAN ENDOWMENT FUND:			
5000 shares Eastman Kodak Co. Com			.....
INVESTMENTS, JOY SCHOLARSHIP FUND:			
Massachusetts Hospital Life Insurance Co.			$5,000.00
Bank Interest			.....
INVESTMENTS, SUSAN H. SWETT SCHOLARSHIP FUND:			
Massachusetts Hospital Life Insurance Co.			10,000.00
INVESTMENTS, RICHARD LEE RUSSEL FELLOWSHIP FUND:			
$2,000.00 Fisk Wharf and Warehouse Trust			1,980.00
INVESTMENTS, JONATHAN WHITNEY FUND:			
$25,000.00	American Thread Co. 6%	1928	.....
25,000.00	Atchison, Topeka & St. Fe Ry. Co. 4½%	1962	24,381.25
35,000.00	Chicago Union Station 4½%	1963	35,246.00
25,000.00	Detroit Edison Co. 5%	1933	25,387.00
25,000.00	Georgia Ry. & Electric Co. 5%	1932	25,501.00
25,000.00	General Elec. Co. 6%	1940	.....
25,000.00	Ill. Central R.R. Co. 4%	1952	.....
25,000.00	Maine Central Ry. Co. 4½%	1935	25,025.00
25,000.00	Montreal, City of, 5%	1936	.....
25,000.00	New York City 4¼%	1964	26,140.00
25,000.00	New York Telephone Co. 4½%	1939	24,150.39
25,000.00	Swift & Co. 5%	1944	.....
25,000.00	U. S. A. 4¼%	1928	.....
21,000.00	United Electric Securities Co. 5%	1940	21,082.00
25,000.00	Western Tel. & Tel. Co. 5%	1932	.....
150,000.00	Mortgage Note, M. I. T. Dormitory		150,000.00
			$356,912.64
INVESTMENTS, MALCOLM COTTON BROWN FUND:			
$10,000.00	Met. West Side Elev. Ry. Co. 4%	1938	.....
15,000.00	Met. West Side Elev. Ry. Co. 4%	1938	.....
INVESTMENTS, FRANK HARVEY CILLEY FUND:			
$8,000.00	Electrical Securities Corp. 5%	1940	$7,960.00
10,000.00	New York City 4¼%	1964	10,430.00
5,000.00	St. Louis, Iron Mt. & So. R.R. 4%	1933	4,812.50
40 shares	Boston & Albany R.R. Co.		8,000.00
10 "	Boston & Providence R.R. Corp.		2,500.00
30 "	Edison Elec. Illum. Co.		7,959.00
50 "	Boston & Maine R.R. 1st Pfd.		.....
.....	Fitchburg R.R. Co. Pfd.		5,000.00
75 shares	Massachusetts Gas Cos. Pfd.		6,825.00
50 "	N. Y., N. H. & H. R.R.		4,700.00
25 "	Springfield Ry. Cos. Pfd.		2,125.00
50 "	West End Street Ry. Co. Com		3,600.00
	South American Properties		1.00
Isabelle Aznive, Mortgage Note 6%			1,600.00
Jacob Levenson, Mortgage Note 5%			2,400.00
Total			$67,912.50

Schedule H. (*Continued*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
$4,000,000.00	.....	$4,000,000.00	.....	$75,000.00
.....	.....	5,000.00	.....	225.00
.....	.....	.....	.....	222.53
.....	.....	10,000.00	.....	450.00
.....	.....	1,980.00	.....	80.00
27,500.00	$313.00	27,187.00	$375.00	750.00
.....	.....	24,381.25	.....	1,125.00
.....	5.00	35,241.00	.....	1,575.00
.....	29.00	25,358.00	.....	1,250.00
.....	41.00	25,460.00	.....	1,250.00
23,625.00	.....	23,625.00	70.75	.....
22,625.00	.....	22,625.00	.....	1,000.00
.....	2.00	25,023.00	.....	1,125.00
25,000.00	.....	25,000.00	.....	1,250.00
.....	26.00	26,114.00	.....	1,062.50
.....	.....	24,150.39	.....	1,125.00
22,625.00	.....	22,625.00	163.20	.....
25,000.00	.....	25,000.00	.....	.....
.....	4.00	21,078.00	.....	1,050.00
25,562.50	46.50	25,516.00	.....	1,250.00
.....	.....	150,000.00	.....	6,750.00
$171,937.50	$466.50	$528,383.64	$608.95	$20,562.50
$4,100.00	.....	$4,100.00	.....	$200.00
6,750.00	.....	6,750.00	.....	300.00
$10,850.00	.....	$10,850.00	.....	$500.00
.....	.....	$7,960.00	.....	$400.00
.....	$10.00	10,420.00	.....	425.00
.....	.....	4,812.50	.....	200.00
.....	.....	8,000.00	.....	450.00
.....	.....	2,500.00	.....	100.00
.....	.....	7,959.00	.....	360.00
$5,000.00	.....	5,000.00	.....	.....
.....	5,000.00	.....	.....	137.50
.....	.....	6,825.00	.....	300.00
.....	.....	4,700.00	.....	.....
.....	.....	2,125.00	.....	100.00
.....	.....	3,600.00	.....	175.00
.....	.....	1.00	.....	.....
.....	.....	1,600.00	.....	96.00
.....	.....	2,400.00	.....	120.00
$5,000.00	$5,010.00	$67,902.50	.....	$2,863.50

Schedule H. (*Continued*)

		Due	Balance at beginning of year
INVESTMENTS, PRATT FUND:			
50 shares	American Linen Co.		$4,000.00
50 "	American Sugar Refining Co. Pfd.		5,900.00
100 "	Beacon Trust Co.		25,000.00
21 "	Border City Mfg. Co.		2,312.77
273 "	Boston Elevated Ry. Co.		18,736.00
40 "	Boston & Maine R.R. 1st Pfd.		.....
45 "	Boston & Albany R.R.		8,010.00
155 "	Cambridge Gas Light Co.		34,875.00
100 "	Copper Range Co.		6,700.00
25 "	Federal Trust Co.		3,450.00
.....	Fitchburg R.R. Pfd.		3,000.00
25 "	King Phillip Mills		3,500.00
115 "	Lake Copper Co.		1,610.00
78 "	Lincoln Mfg. Co.		7,800.00
50 "	Massachusetts Gas Companies		4,100.00
600 "	Mexican Cons. Mining Co.		600.00
34 "	Old Colony R.R. Co.		4,760.00
86 "	Salem Gas Light Co.		17,200.00
26 "	Tecumseh Mills		3,562.00
200 "	Utah Cons. Mining Co.		2,800.00
25 "	Wamponoag Mills		2,000.00
15 "	West End St. Ry. Co.		1,125.00
100 "	Winona Copper Co.		611.99
15,000.00	Boston, City of, 4%	1924	15,000.00
20,000.00	Boston, City of, 4%	1935	20,000.00
	Commonwealth of Massachusetts 4%	1919	15,000.00
	Commonwealth of Massachusetts 4%	1920	15,000.00
5,000.00	Everett, City of, 4%	1921–25	5,000.00
20,000.00	New York City 4¼%	1964	20,860.00
10,000.00	Salem, City of, 4%	1921–24	10,000.00
11,000.00	Salem, City of, 4%	1921–24	11,000.00
2,550.00	U. S. A. 4¼%	1933	.....
2,000.00	Winchester, Town of, 4%	1919–23	2,000.00
2,000.00	Winchester, Town of, 4%	1918–23	2,000.00
Deposits in Savings Banks			2,172.11
Edward W. Fuller, Mortgage Note 6%			43,000.00
Chester J. O'Brien, Mortgage Note 6%			50,000.00
Cambridge Tobacco Co. Mortgage Note 6%			.....
Catharine R. Walsh, Mortgage Note 5%			14,000.00
Real Estate, Huntington Ave., Boston			34,100.00
Real Estate, Huntington Ave., Boston			27,000.00
Real Estate, Huntington Ave., Boston			26,900.00
Real Estate, Mass. Ave. and Prospect St., Cambridge			176,000.00
Real Estate, Prospect St. and Austin St., Cambridge			74,100.00
Real Estate, Massachusetts Ave., Cambridge			17,500.00
Real Estate, Massachusetts Ave., Cambridge			90,900.00
Real Estate, Franklin St., Boston			82,000.00
			$915,184.87

Grand Total, Schedule **D** $9,146,602.83

Schedule H. (*Continued*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	.....	$4,000.00	.....	$875.00
.....	.....	5,900.00	.....	350.00
.....	.....	25,000.00	.....	2,000.00
.....	.....	2,312.77	.....	462.00
.....	.....	18,736.00	.....	1,165.00
$3,000.00	.....	3,000.00	.....	.....
.....	.....	8,010.00	.....	506.25
.....	.....	34,875.00	.....	1,550.00
.....	.....	6,700.00	.....	200.00
.....	.....	3,450.00	.....	225.00
.....	$3,000.00	.....	.....	110.00
.....	.....	3,500.00	.....	1,712.50
.....	.....	1,610.00	.....	.....
.....	.....	7,800.00	.....	2,184.00
.....	.....	4,100.00	.....	200.00
.....	.....	600.00	.....	.....
.....	.....	4,760.00	.....	238.00
.....	.....	17,200.00	.....	688.00
.....	.....	3,562.00	.....	1,794.00
.....	.....	2,800.00	.....	.....
.....	.....	2,000.00	.....	525.00
.....	.....	1,125.00	.....	60.00
.....	.....	611.99	.....	.....
.....	.....	15,000.00	.....	600.00
.....	.....	20,000.00	.....	800.00
.....	15,000.00	.....	.....	300.00
.....	15,000.00	.....	.....	600.00
.....	.....	5,000.00	.....	200.00
.....	20.00	20,840.00	.....	850.00
.....	.....	10,000.00	.....	400.00
.....	.....	11,000.00	.....	440.00
2,550.00	.....	2,550.00	.....	54.18
.....	.....	2,000.00	.....	80.00
.....	.....	2,000.00	.....	80.00
.....	.....	2,172.11	.....	93.74
.....	.....	43,000.00	.....	2,580.00
.....	.....	50,000.00	.....	2,272.50
30,000.00	.....	30,000.00	.....	900.00
.....	14,000.00	.....	.....	925.34
.....	.....	34,100.00	.....	1,888.64
.....	.....	27,000.00	.....	1,911.22
.....	.....	26,900.00	.....	1,962.79
.....	.....	176,000.00	.....	14,430.00
.....	.....	74,100.00	.....	6,239.03
.....	17,500.00	.....	.....	767.98
.....	.....	90,900.00	.....	13,253.57
.....	.....	82,000.00	.....	5,327.75
$35,550.00	$64,520.00	$886,214.87	.....	$71,801.49
$5,365,876.99	$381,070.28	$14,131,409.54	$24,664.94	$549,949.65

SCHEDULE J

EDUCATIONAL PLANT

Land, Buildings and Equipment

Land, Boylston, Clarendon and Newbury Streets, Boston	$1,500,000.00
Rogers Building, Boylston Street, Boston	200,000.00
Walker Building, Boylston Street, Boston	150,000.00
Land and Improvements, New Technology, Cambridge	1,113,559.79
Main Educational Building Group, Cambridge	4,069,981.20
Pratt School of Naval Architecture, Cambridge	64,860.76
Mechanic Arts Building, Cambridge	82,553.45
Power Plant (inc. Machinery and Equipment), Cambridge	261,278.63
Educational Equipment, Cambridge	1,727,299.96
Steam and Electrical Distribution System, Cambridge	155,448.64
Gas Engine Laboratory, Cambridge	26,301.88
Service Garage, Cambridge	5,981.54
Athletic Field, Cambridge	19,709.54
Summer Camp, East Machias, Maine	36,081.81
Walker Memorial Building, Cambridge	574,934.45
Walker Memorial Building, Equipment	141,926.39
Dormitories, Cambridge	331,357.67
Dormitories, Equipment	20,707.57
New Service Building	37,837.42
Miscellaneous and Undistributed	272,937.62
Total, June 30, 1920 (Schedule D)	$10,792,758.32

SCHEDULE K-1

PRINCIPAL GIFTS AND APPROPRIATIONS FOR EDUCATIONAL PLANT

George Eastman, for New Buildings	$3,500,000.00
Maria A. Evans, for Dormitories	100,000.00
Appropriation, Maria A. Evans Fund, for New Equipment	133,780.60
T. C. du Pont, Donation for Land	500,000.00
T. C. du Pont, Donation for Dormitories	100,000.00
T. C. and P. S. du Pont. Charles Hayden, for Mining Building	215,000.00
Pratt Fund, for School of Naval Architecture	40,000.00
Alumni Fund, Equipment, Dormitories and Walker Memorial	604,000.00
Walker Memorial Fund, for Walker Memorial	167,303.96
Improvement Fund for Walker Memorial	24,491.04
Appropriation of Emma Rogers' Fund, for Equipment	528,077.06
Estate of F. W. Emery, for New Equipment	125,611.30
Appropriation of Lucius Tuttle Fund for New Equipment	50,000.00
Appropriation of Nathaniel Thayer Fund for New Equipment	25,000.00
Appropriation of French Fund for New Equipment	100,843.34
Appropriation of George B. Dorr Fund for New Equipment	49,573.47
Land in Boston, Grant of Commonwealth	1,500,000.00
Sale of Land and Buildings in Boston	656,919.45
Equipment from Buildings in Boston (estimated)	500,000.00
Other Funds, Donations, etc.	1,496,834.56
Total, June 30, 1920 (Schedule D)	$10,417,434.78

SCHEDULE P

ENDOWMENT FUNDS FOR GENERAL PURPOSES

Increases and Decreases of Funds for General Purposes

Invested funds restricted	*Funds June 30, 1919*	*Investment income*	*Other increases or decreases of funds*	*Expenditure*	*Funds June 30, 1920*
George Eastman Building Fund	$2,500,000.00	$111,265.00	.....	$111,265.00	$2,500,000.00
George Eastman Endowment Fund	.....	75,000.00	$4,000,000.00	75,000.00	4,000,000.00
General Endowment Fund	1,527,549.00	67,960.66	.....	67,960.66	1,527,549.00
Educational Endowment Fund	.....	17,802.40	1,540,459.50	17,802.40	1,540,459.50
George Robert Armstrong	5,000.00	222.53	.....	222.53	5,000.00
Charles Choate	33,932.63	1,513.12	.....	1,513.12	33,932.63
Eben S. Draper	100,000.00	4,900.00	.....	4,900.00	100,000.00
Martha Ann Edwards	30,000.00	1,335.10	.....	1,335.10	30,000.00
William Endicott	25,000.00	1,112.65	.....	1,112.65	25,000.00
Jonathan French	25,212.48	1,112.65	.....	1,112.65	25,212.48
James Fund	163,654.21	7,254.51	.....	7,254.51	163,654.21
Katharine B. Lowell	5,000.00	222.53	.....	222.53	5,000.00
M. I. T. Alumni Fund	.....	.....	6,409.86	.....	6,409.86
Richard Perkins	50,000.00	2,225.30	.....	2,225.30	50,000.00
John W. and Belinda L. Randall	83,452.36	3,693.99	.....	3,693.99	83,452.36
William B. Rogers	250,225.00	9,580.00	.....	9,580.00	250,225.00
Saltonstall Fund	*48,874.16	2,136.30	.....	1,602.23	49,408.23
Samuel E. Sawyer	4,764.40	209.17	.....	209.17	4,764.40
William J. Walker	23,663.59	1,023.63	.....	1,023.63	23,663.59
Albion K. P. Welch	5,000.00	222.53	.....	222.53	5,000.00
Unrestricted					
Sidney Bartlett	10,000.00	445.06	.....	445.06	10,000.00
A. F. Bemis	10,000.00	445.06	.....	445.06	10,000.00
Stanton Blake	5,000.00	222.53	.....	222.53	5,000.00
Helen Collamore	12,483.97	534.07	.....	534.07	12,483.97
Charles C. Drew	.....	445.06	64,000.00	445.06	64,000.00
Maria A. Evans	63,180.60	.....	70,600.00	133,780.60	.....
Caroline L. W. Frnech	100,843.34	.....	.....	100,843.34	.....
Arthur T. Lyman	5,000.00	222.53	.....	222.53	5,000.00
James McGregor	2,500.00	111.27	.....	111.27	2,500.00
Nathaniel C. Nash	10,000.00	445.06	.....	445.06	10,000.00
Frank E. Peabody	.....	22.25	522.22	22.25	522.22
Frances M. Perkins	16,525.00	734.35	.....	734.35	16,525.00
Emma Rogers	203,077.06	.....	.....	203,077.06	.....
Robert E. Rogers	7,680.77	333.79	.....	333.79	7,680.77
Richard B. Sewall	30,000.00	1,335.10	.....	1,335.10	30,000.00
Seth K. Sweetser	25,061.62	1,112.65	.....	1,112.65	25,061.62
Charles G. Weld	15,000.00	667.59	.....	667.59	15,000.00
Alexander S. Wheeler	30,000.00	1,335.10	.....	1,335.10	30,000.00
	$5,427,680.19	$317,203.54	$5,681,991.58	$754,370.47	$10,672.504.84

*One-fourth income added to fund.

SCHEDULE Q

ENDOWMENT FUNDS FOR DESIGNATED PURPOSES

Increases and Decreases of Funds for Designated Purposes

Invested funds	*Funds June 30, 1919*	*Investment income*	*Other increases or decreases of funds*	*Expenditures*	*Funds June 30 1920*
FUNDS FOR SALARIES:					
Samuel C. Cobb For General Salaries	$34,000.00	$1,602.21	$2,000.00	$1,602.21	$36,000.00
Sarah H. Forbes For General Salaries	500.00	22.25	.....	22.25	500.00
George A. Gardner For General Salaries	20,000.00	890.12	.....	890.12	20,000.00
James Hayward Professorship of Engineering	18,800.00	836.72	.....	836.72	18,800.00
William P. Mason Professorship of Geology	18,800.00	836.72	.....	836.72	18,800.00
Henry B. Rogers For General Salaries	25,000.00	1,112.65	.....	1,112.65	25,000.00
Nathaniel Thayer Professorship of Physics	25,000.00	1,112.65	.....	1,112.65	25,000.00
Totals	$142,100.00	$6,413.32	$2,000.00	$6,413.32	$144,100.00
FUNDS FOR LIBRARY READING ROOMS AND GYMNASIUM:					
Cilley Fund	$72,707.81	$2,863.50	.....	$1,100.88	$74,470.43
Charles Lewis Flint Library	5,000.00	222.53	.....	222.53	5,000.00
William Hall Kerr Library	2,131.89	89.01	.....	80.00	2,140.90
Arthur Rotch Architectural Library	5,000.00	222.53	.....	222.53	5,000.00
John Hume Tod Fund	2,811.56	120.16	.....	143.34	2,788.38
Technology Matrons' Teas Fund	2,089.80	89.01	.....	89.80	2,089.01
Edna Dow Cheney for Margaret Cheney Reading Room	14,135.71	667.59	$15.35	1,172.57	13,646.08
Totals	$103,876.77	$4,274.33	$15,35	$3,031.65	$105,134.80
FUNDS FOR DEPARTMENTS:					
George Eastman for Chemistry and Physics	$400,000.00	$17,802.40	.....	$17,802.40	$400,000.00
William P. Atkinson	12,954.55	578.58	$127.65	578.58	13,082.20
Frank W. Boles Memorial	17,147.30	756.60	.....	346.98	17,556.92
Samuel Cabot (Industrial Chemistry)	64,231.69	2,848.42	.....	493.96	66,586.15
Wm. E. Chamberlain Fund	6,000.00	267.04	.....	267.04	6,000.00
Chemical Engineering Fund	304,525.63	13,351.00	90.50	9,667.12	308,300.01
Susan E. Dorr Fund	95,955.67	4,272.56	.....	4,272.56	95,955.67
George H. May Chem. Dept.	5,000.00	222.53	.....	222.53	5,000.00
Pratt Naval Arch. Fund	958,772.82	71,801.49	22,500.00	75,039.59	978,034.72
Arthur Rotch Architectural Fund	25,000.00	1,112.65	.....	1,112.65	25,000.00
Edmund K. Turner Fund	*208,893.69	9,257.25	.....	7,452.94	210,698.00
Totals	$2,098,481.35	$122,270.52	$22,718.15	$117,256.35	$2,126,213.67

*One-fourth net income added to fund.

Schedule Q. *(Continued)*

Invested funds	*Other funds June 30, 1919*	*Investment income*	*Other increases or decreases of funds*	*Expenditures*	*Funds June 30, 1920*
FUNDS FOR RESEARCH:					
Ellen H. Richards Research Fund	$15,847.98	$667.59	.....	$642.36	$15,873.21
Charlotte B. Richardson (Industrial Chemistry)	37,378.78	1,646.71	.....	1,200.00	37,825.49
Technology Plan Research	.....	.....	$8,100.00	.....	8,100.00
Whitney Fund	41,672.62	1,824.74	.....	.....	43,497.36
Totals	$94,899.38	$4,139.04	$8,100.00	$1,842.36	$105,296.06
FUNDS FOR FELLOWSHIPS:					
Malcolm Cotton Brown	.....	$500.00	$10,850.00	.....	$11,350.00
Collamore Fund	$11,445.70	507.37	.....	.....	11,953.07
Dalton Graduate Chemical	5,761.34	253.68	.....	$250.00	5,765.02
Moore Fund	5,942.62	262.58	.....	.....	6,205.20
Willard B. Perkins	8,688.99	387.20	.....	.....	9,076.19
Monsanto	.....	.....	500.00	500.00	.....
Richard L. Russel	2,416.57	80.00	.....	80.00	2,416.57
Henry Saltonstall	10,818.93	480.67	.....	520.00	10,779.60
James Savage	14,356.54	623.08	.....	950.00	14,029.62
Susan H. Swett	10,945.45	450.00	.....	450.00	10,945.45
Totals	$70,376.14	$3,544.58	$11,350.00	$2,750.00	$82,520.72
FUNDS FOR SCHOLARSHIPS:					
Elisha Atkins	$5,366.97	$235.88	.....	$225.00	$5,377.85
Billings Student Fund	52,670.20	2,314.31	.....	2,220.00	52,764.51
Jonathan Bourne	10,525.41	467.31	.....	450.00	10,542.72
Lucius Clapp	5,278.80	231.43	.....	225.00	5,285.23
Lucretia Crocker	56,832.95	2,536.84	.....	584.00	58,785.79
Isaac W. Danforth	5,433.23	240.33	.....	225.00	5,448.56
Ann White Dickinson	42,845.98	1,904.85	.....	1,850.00	42,900.83
du Pont Scholarship	750.00	.....	.....	750.00	.....
Farnsworth Fund	5,416.97	240.33	.....	225.00	5,432.30
Charles Lewis Flint	5,484.48	240.33	.....	225.00	5,499.81
Sarah S. Forbes	3,577.52	155.73	.....	135.00	3,598.25
George Hollingsworth	5,309.25	235.88	.....	225.00	5,320.13
T. Sterry Hunt	3,256.18	142.41	.....	135.00	3,263.59
William F. Huntington	5,442.07	240.33	.....	225.00	5,457.40
Joy Scholarships	10,000.00	447.53	.....	447.53	10,000.00
Income Joy Scholarships	4,344.84	.....	$447.53	.....	4,792.37
Letter Box Fund	.....	.....	137.96	.....	137.96
William Litchfield	5,457.97	240.33	.....	225.00	5,473.30
Elisha T. Loring	5,467.76	240.33	.....	225.00	5,483.09
George H. May	5,096.17	222.53	.....	450.00	4,868.70
James H. Mirrlees	3,057.56	133.51	.....	135.00	3,056.07
Nichols Fund	5,416.97	240.33	.....	225.00	5,432.30
Charles C. Nichols	5,458.26	240.33	.....	225.00	5,473.59
John Felt Osgood	5,407.97	240.33	.....	225.00	5,423.30
Richard Perkins	56,567.07	2,514.59	.....	2,450.00	56,631.66
Thomas Sherwin	5,466.97	240.33	.....	225.00	5,482.30
Susan Upham	1,074.07	44.50	.....	45.00	1,073.57
Ann White Vose	66,032.55	2,937.42	.....	2,900.00	66,069.97
Louis Weissbein	4,190.16	186.92	.....	180.00	4,197.08
Frances Erving Weston	1,310.00	.....	200.00	.....	1,510.00
Samuel Martin Weston	200.00	.....	200.00	200.00	200.00
Totals	$392,738.33	$17,114.94	$985.49	$15,856.53	$394,982.23

Schedule Q. (*Continued*)

Invested funds	*Funds June 30, 1919*	*Investment income*	*Other increases or decreases of funds*	*Expenditures*	*Funds June 30, 1920*
FUNDS FOR PRIZES:					
Arthur Rotch Prize Fund in Architecture . . .	$5,431.97	$240.33	.....	$400.00	$5,272.30
Arthur Rotch "Special" Prize Fund in Architecture	6,231.97	275.94	.....	200.00	6,307.91
Totals	$11,663.94	$516.27	.....	$600.00	$11,580.21
FUNDS FOR RELIEF:					
Architectural Society .	$1,373.12	$57.86	.....	.....	$1,430.98
Edward Austin	411,775.95	17,223.02	.....	$13,445.16	415,553.81
Thomas Wendall Bailey	2,609.31	130.72	.....	50.00	2,690.03
Levi Boles	11,618.70	516.27	.....	440.00	11,694.97
Bursar's Fund	7,240.31	319.56	$595.32	1,151.51	7,003.68
Mabel Blake Case . .	.....	89.01	25,000.00	.....	25,089.01
Dormitory Fund . . .	.....	124.62	2,857.10	.....	2,981.72
Norman H. George . .	30,224.50	2,670.36	40,000.00	220.00	72,674.86
Teachers' Fund	119,422.03	5,296.21	.....	5,189.96	119,528.28
Jonathan Whitney . .	530,954.34	19,953.55	.....	15,116.00	535,791.89
Morrill Wyman . . .	76,909.86	3,426.99	.....	3,000.00	77,336.85
Totals	$1,192,128.12	$49,808.17	$68,452.42	$38,612.63	$1,271,776.08
Funds for General Purposes	$5,427,680.19	$317,203.54	$5,681,991.58	$754,370.47	$10,672,504.84
Funds for Salaries . . .	142,100.00	6,413.32	2,000.00	6,413.32	144,100.00
Funds for Libraries, Reading Rooms and Gymnasiums	103,876.77	4,274.33	15.35	3,031.65	105,134.80
Funds for Departments .	2,098,481.35	122,270.52	22,718.15	117,256.35	2,126,213.67
Funds for Research . . .	94,899.38	4,139.04	8,100.00	1,842.36	105,296.06
Funds for Fellowships . .	70,376.14	3,544.58	11,350.00	2,750.00	82,520.72
Funds for Scholarships. .	392,738.33	17,114.94	985.49	15,856.53	394,982.23
Funds for Prizes	11,663.94	516.27	.....	600.00	11,580.21
Funds for Relief	1,192,128.12	49,808.17	68,452.42	38,612.63	1,271,776.08
Grand Total	$9,533,944.22	$525,284.71	$5,795,612.99	$940,733.31	$14,914,108.61

SCHEDULE R

INCREASES AND DECREASES OF MINOR FUNDS

	Funds June 30, 1919	*Income*	*Other Increases*	*Expenditures Salaries*	*Expenditures Other*	*Funds, June 30, 1920*
MINOR FUNDS:						
American Tel. & Tel. Research Fund	$1,316.63	$14,763.66	.....	$5,013.45	$1,029.64	$10,037.20
American Tel. & Tel. Library Fund	528.09	3,803.46	.....	1,180.15	888.36	2,263.04
Commercial Research Fund	7.52	.....	.....	.....	7.52	.....
Course XV Fund	98.80	130.00	.....	.....	80.00	148.80
Dormitory Fund	2,857.10	.....	.....	.....	2,857.10	.....
Electric Railway Traffic Research Fund	1,645.09	.....	.....	.....	.....	1,645.09
Jacques Fund	803.53	.....	.....	.....	.....	803.53
Letter Box Fund	137.96	.....	.....	.....	137.96	.....
Macy Research Fund	2.37	.....	.....	.....	2.37	.....
Ozone Fund	14.18	.....	.....	.....	14.18	.....
Physico-Chemical Research Fund	407.67	.....	†$6,817.81	5,525.90	1,699.58	.....
President's Fund	1,013.74	.....	.....	.....	303.31	710.43
Research Laboratory of Applied Chemistry	1,159.26	37,241.39	‡1,200.00	28,902.07	12,480.17	1,781,59*
Research Laboratory of Organic Chemistry	1,745.53	.....	.....	.....	.....	1,745.53
Roentgen Ray Experiment Fund	659.46	.....	.....	.....	11.32	648.14
Sanitary Research Fund	*556.75	6.00	†2,333.01	1,780.00	2.26	.....
Traveling Scholarship in Architecture	750.00	.....	.....	.....	875.00	125.00*
Vehicle Research Fund	18.68	.....	.....	.....	18.68	.....
	$12,608.86	$55,944.51	$10,350.82	$42,401.57	$20,407.45	$16,095.17

*Overdraft.
†Appropriation from Current Funds.
‡Appropriation from Richardson Fund.

Boston, Mass., September 28, 1920.

Report of the Auditing Committee to the Corporation of the Massachusetts Institute of Technology.

This Committee reports that in carrying out its duties it has employed Messrs. Harvey S. Chase & Company, Certified Public Accountants, to examine the books and audit the accounts of the Treasurer and Bursar for the year ended June 30, 1920. The report of this Company is attached.

The Committee has also made investigations as to the methods and procedure of the Accounting Department at the Institute and has satisfied itself as to its adequacy.

AUDITING COMMITTEE.

MERTON L. EMERSON.
WILLIAM L. PUTNAM.
EDWARD W. ROLLINS.

SCHEDULE S

CURRENT SURPLUS

Balance, July 1, 1919	$64,729.33
Net increase, Schedule A	29,709.90
Balance, June 30, 1920, Schedule D	$94,439.23

Details of Losses and Gains, etc.

LOSSES AND CHARGES:	
Accounts Receivable — charged off	$216.86
Students' Fees Receivable — charged off	933.22
Students' Deposits Receivable — charged off	50.55
Total, Schedule A	$1,200.63
GAINS AND CREDITS:	
Inventories (not previously included)	$51,667.19
Gains on sales of Bonds	6,231.89
Collections (previously charged off)	304.48
Students' Deposits (account of previous years)	6,449.14
Total, Schedule A	$64,652.70

84 State Street, Boston

To the Auditing Committee of the Massachusetts Institute of Technology, Cambridge, Mass.

Gentlemen:

We hereby certify that we have examined the books and have audited the accounts of the Treasurer and Bursar of the Massachusetts Institute of Technology for the year ended June 30, 1920.

We have established the assets and liabilities of the Institute as set forth on the balance-sheet of the printed report of the Treasurer, including a physical examination on September 14 and 15, 1920 of the securities held by the Old Colony Trust Company, and all such securities reported as on hand by the Trust Company at the beginning of the year or received since, were either found to be on hand at the date of our examination or were fully accounted for by the records.

The various schedules, A to S inclusive, except the supporting details of Schedule C, have been verified by us as being accurately drawn from the books and truly showing the intent of each schedule.

We have verified the details of the bookkeeping during the year, have examined the vouchers for disbursements and have satisfied ourselves that all receipts of money have been acknowledged on the books and deposited in the bank and that the cash balances shown by the books on June 30, 1920, were actually available and that these balances are correct.

Very respectfully,

HARVEY S. CHASE & Co.,
Certified Public Accountants.

1-21-1500-T.P.

BULLETIN

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PRESIDENT'S REPORT FOR 1919-1920, January, 1921.

DIRECTORY OF OFFICERS AND STUDENTS, 1920-1921. December, 1920.

SUMMER SCHOOL OF CHEMICAL ENGINEERING. December, 1920.

SCHOOL OF CHEMICAL ENGINEERING PRACTICE, COURSE X-A. November, 1920.

GENERAL INFORMATION, REQUIREMENTS FOR ADMISSION. October, 1920.

SUMMER COURSES. May, 1920.

SUMMER SURVEYING COURSES AT CAMP TECHNOLOGY. May, 1920.

COURSES OF STUDY AND SUBJECTS OF INSTRUCTION. April, 1920.

A COÖPERATIVE COURSE IN ELECTRICAL ENGINEERING. COURSE VI-A. April, 1920.

GRADUATE STUDY AND RESEARCH. March, 1920.