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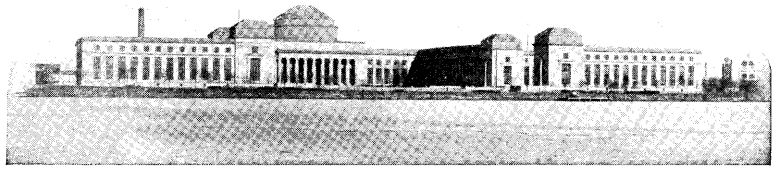
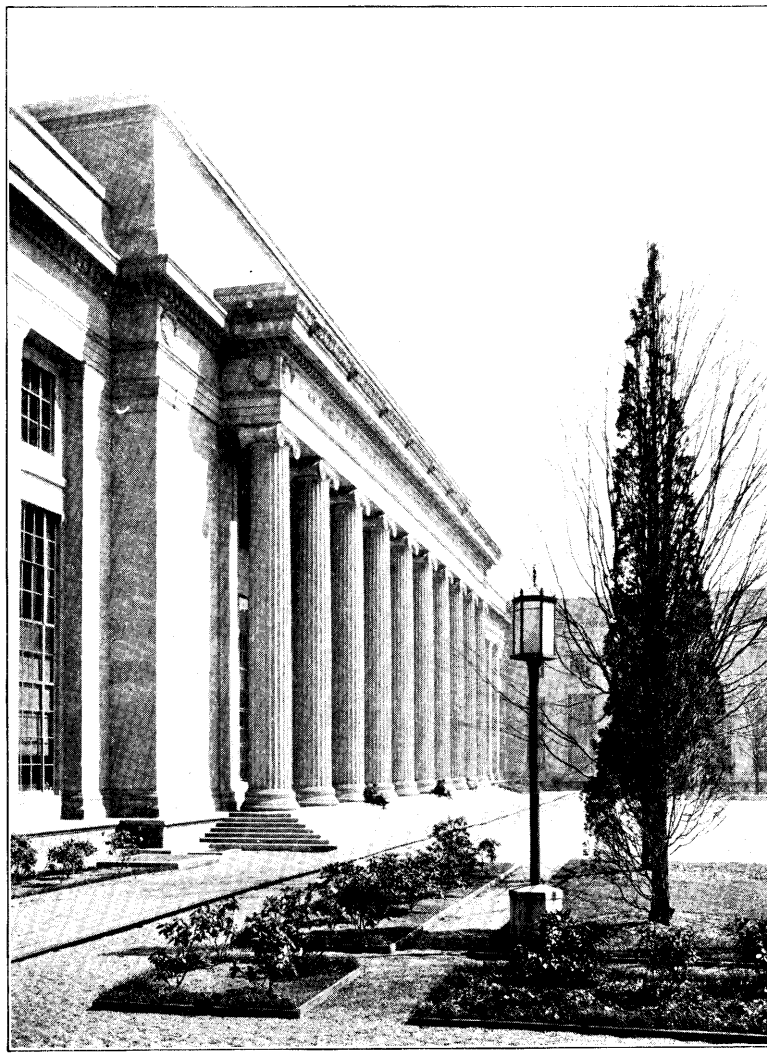


Massachusetts Institute of Technology

PRESIDENT'S REPORT

OCTOBER, 1922

Cambridge, Massachusetts
1922



MAIN ENTRANCE FROM EASTMAN COURT

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

REPORTS OF THE PRESIDENT AND TREASURER

FOR THE YEAR 1921-1922

THE TECHNOLOGY PRESS
CAMBRIDGE, MASSACHUSETTS
1922

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REPORT OF THE PRESIDENT

(Prepared by the Administrative Committee)

To the Members of the Corporation:

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

During the illness of President Nichols the Administrative Committee continued to function and following his resignation this committee has recommended from time to time that action be taken on such problems as could not well be held over until after the appointment of a new President.

Changes in the Corporation. The Term Members retiring in 1922 are Elisha Lee, '92, Edward W. Rollins, '71 and Dr. Willis R. Whitney, '90. The new Term Members are Lester D. Gardner, '98, Frank W. Lovejoy, '94 and William C. Potter, '97.

Losses in the Faculty. Charles R. Cross, Professor Emeritus, died suddenly on November 16, 1921. The Institute has lost in the death of Professor Cross one of that group of men who, by their untiring energy and devotion, carried Technology over the shoals on which it came near foundering in its early days. Professor Cross was in charge of the Department of Physics from 1877 until his retirement on July 1, 1917.

By resignation the Faculty has lost a number of very able men whom it will be difficult at once to replace. Some go to other educational institutions, where they are to fill positions of greater responsibility, others into important positions in the industrial world, where they will enhance the reputation already established by Technology.

Professor Edwin B. Wilson, Head of the Department

of Physics since 1917, a member of the Administrative Committee since the resignation from that committee of Dr. W. H. Walker in March, 1920, and a member of the staff of the Mathematical Department since 1907, has gone to the School of Public Health of Harvard University.

Professor Henry P. Talbot, Head of the Department of Chemistry since 1901 has resigned to accept the office of Dean of Students at the Massachusetts Institute of Technology.

Professor Charles H. Warren, connected with the Institute since 1900, Head of the courses in General Science and Engineering, in charge of the Division of General Studies and a member of the Department of Mining, Metallurgy and Geology, has gone to Yale to become Dean of the Sheffield Scientific School.

Professor H. O. Hofman, who has been connected with the Department of Mining and Metallurgy since 1884 has retired on account of ill health.

Professor R. E. Wilson, Director of the Research Laboratory of Applied Chemistry, associated with the department since 1916, has gone into industrial work.

Colonel J. B. Christian, Head of the Department of Military Science, has retired from the Army after thirty years of service.

Associate Professor Walter Humphreys, Registrar of Technology since 1902, has resigned to become Secretary-Treasurer of the National Association of Wool Manufacturers.

Assistant Professor H. B. Luther has been made Head of the Department of Civil Engineering at the University of Cincinnati.

Assistant Professors L. W. Parsons and C. S. Venable of the Research Laboratory of Applied Chemistry have taken charge of Research Laboratories in connection with large industrial enterprises.

Assistant Professor M. D. Hersey of the Physics Department has gone to the Bureau of Mines at Pittsburgh.

Captain H. F. Clark, Assistant Professor of Military Science, has been transferred.

Appointments from Without. The Department of Mining, Metallurgy and Geology has been greatly strengthened by the addition to its staff of W. Spencer Hutchinson, as Professor of Mining, in charge of the option in Mining Engineering; and C. B. Waterhouse as Professor of Metallurgy, in charge of the option in Metallurgy.

Professor Albert Ferran, appointed Professor of Design a year ago, took up work in the Architectural Department in January, 1922.

Mr. W. M. Fife has been appointed Assistant Professor of Civil Engineering.

Mr. A. C. Hardy has been appointed Assistant Professor of Optics and Photography.

Captain E. H. Levy and Lieutenant J. M. Heath have been detailed to the Military Science Department as Assistant Professors of Military Science.

Appointments from Staff. Professor C. L. Norton has been appointed a member of the Administrative Committee; he has also been chosen Head of the Department of Physics.

Professors A. E. Burton, Dwight Porter and H. O. Hofman have each been made Professor Emeritus.

Dr. H. P. Talbot, who has been Acting Dean of Students during Professor Burton's absence has been appointed Dean, and Mr. H. E. Lobdell has been appointed Assistant Dean of Students.

Professor S. C. Prescott who, since the death of Professor Sedgwick, has served as Acting Head of the Department of Biology and Public Health has been made Head of that Department.

Professor F. G. Keyes has been appointed Acting Head of the Department of Chemistry.

Professor C. L. E. Moore has been put in charge of the courses in General Science, General Engineering and Mathematics.

Professor William Emerson, Head of the Department of Architecture, has been given charge of the Division of General Studies.

Professor A. L. Merrill has been made Acting Registrar

with Mr. J. C. MacKinnon in immediate charge of the office of Registrar.

Professor T. H. Dillon has been appointed Director of the Summer Session.

Professor E. F. Miller has been put in charge of the Ordnance School.

Associate Professor R. T. Haslam has been appointed Director of the Research Laboratory of Applied Chemistry.

The Medical Department and that of Physical Training have been merged into a Department of Hygiene with the following personnel:

Dr. George W. Morse, Director.

Dr. H. P. Talbot, Dean of Students.

Dr. B. G. Sibley, Assistant to Medical Director.

Dr. L. W. Croke, Second Assistant to Medical Director.

Mr. F. M. Kanaly, Director of Physical Training.

New Buildings. Two buildings to be used as laboratories have been erected during the past year.

One, 45 feet by 90 feet, on the south side of Vassar Street, of slow burning mill construction, designed especially to house about 2,500 H.P. of gasoline engines belonging to the Ordnance Department of the United States Army; the other on the north side of Vassar Street, near the Boston and Albany tracks, a fireproof building 150 feet by 35 feet. This contains high pressure air and gas compressors, which have been transferred from the main Educational Buildings; also all ammonia compression machines and ammonia absorption machines used for experimental work.

Boat House. Through the courtesy of the Boston Athletic Association our students have for a number of years been given the use of its boat house situated on Charles River Road, about one-half mile from Technology. This boat house, together with its equipment of shells, has been purchased by your Corporation. The building has been slightly modified so as to provide additional shower bath facilities and additional locker facilities; a large heater has been installed, which will make possible the heating of the building during the winter. The Parkway Commission, which has charge of the land on which this house stands,

has granted a long-term lease for this land and additional land sufficient to give a water frontage of 200 feet.

Scholarships in Naval Architecture and Marine Engineering. The American Committee of Lloyds Register of Shipping has established a scholarship in Naval Architecture and Marine Engineering of $500 per annum, tenable for three years.

Dormitories. With the increase in the number of students the difficulties experienced by the student body in finding lodgings have become acute. The need of additional dormitories was brought to your attention by Professor Burton in the President's Report of 1921 and is even more urgent now.

The loyal support which the Faculty has given your Administrative Committee during the period of its service has been of the greatest assistance. The committee was confronted with many problems new to it, with a large increase in the number of students and the consequent danger that, due to this increase, the standard of scholarship might be lowered.

The high standard of scholarship has been maintained, the number of candidates for higher degrees has increased and in every department new work has developed satisfactorily.

H. P. TALBOT
E. F. MILLER
C. L. NORTON

DIVISION OF INDUSTRIAL COÖPERATION AND RESEARCH

The Division of Industrial Coöperation and Research is now completing its third year. The operation of the Division as established under the so-called Technology Plan has been carried on in much the same manner as last year excepting that more effort has been made to get in touch with such contractors as were not making much use of the opportunities offered by the Plan. Special effort has been made to bring to our staff and laboratories serious problems involving lengthy research. So far the success has not been great. Many of our contractors have their own laboratories and prefer to carry on the work in them, using our staff as occasional consultants.

In some cases members of the staff have been taken into industrial plants of the contractors to set up there research and control laboratories and subsequently to act as consultant on the work done. It should be noted in this connection that the danger of members of the teaching staff being attracted to positions in the industries is great. We have, during the year, lost a number of able teachers in this way. The policy of having the research problems handled by the teaching staff rather than by special research men acting under the Director has worked out so well that we have gradually replaced all of the research men by regular members of the Institute staff.

The staff of the Division has been greatly strengthened during the year by the addition of Professor Harrison W. Hayward and Dr. Earl B. Millard as assistant directors.

Dr. Millard is taking care of much of the detail of the administration, and Professor Hayward is visiting the plants of the contractors.

The industrial depression of the early months of the year with its accompanying increase of unemployment greatly increased the personnel work of the Division, but recently the return of more normal conditions has brought us more openings and fewer men. In the mean time, contractors under the Plan have been

put in touch with unusual opportunities of securing good men.

The service of the Division to the Institute as a means of keeping in effective contact with the great industrial public has constantly increased. The number of inquiries is greater and the extent of inquiries upon serious scientific and technical questions is very gratifying. It is believed that the service is making many friends for the Institute among those responsible for industrial operations.

The most serious problem confronting the Division is to find some method of encouraging the contracting companies to make greater use of the Division and not to consider it as a sort of industrial and scientific insurance to be made use of only in case of accident or unusual experience.

C. L. NORTON, *Director.*

REPORT OF THE LIBRARIAN

In its history the Library of the Institute has passed through several stages. During the first stage the Institute can scarcely be said to have had a Library at all. At that time of simple things, books were gradually accumulating in the various libraries through purchase made directly by the departments.

When the William Ripley Nichols collection was given to the Institute, Clement W. Andrews, then an Instructor in Chemistry, was employed to catalogue these books and those in other departments according to a uniform system. In 1889 Mr. Andrews was appointed Librarian of the Institute and given entire charge of the purchase and cataloguing of the books which formed the nucleus of the present Library.

As the number of volumes increased, the departmental libraries became so large that it was necessary to place in charge of them assistants having special library training, and thus the Library gradually developed.

A new cycle began when the Institute was moved to Cambridge. At that time, the greater part of the books were concentrated in the Central Library, and for the first time it became possible to carry on the reference work, which is such an important part of the service rendered generally by college libraries. Otherwise there was little change in the administration.

The feature of open shelves with free access to all who might visit the Library was not changed. This was a unique feature for so large a Library, now containing more than 100,000 volumes. It was a feature of great value and usefulness and much appreciated by serious readers. Unfortunately, however, the privileges of the open shelves were greatly abused. Losses and misplacements became increasingly frequent. Moreover, it was found that the now large and valuable collection was attracting many strangers, and that with a student body of over 3,000 students and an annual circulation of 20,000 volumes, it had become impossible properly to guard the valuable collection so long as free access was allowed to all parts of the book stacks. It was, therefore, with much regret that the Librarian, with the advice of the Library Committee, felt obliged to submit to the Administrative Committee a proposal for the restricted use of the book stacks. This proposal was approved, and during the summer of 1922 a large portion of the book stacks was enclosed, and new rules made for the guidance of readers.

These rules have been framed with a view to giving the greatest possible freedom to serious readers that is consistent with properly safeguarding the valuable collection. It is hoped that the better order in which it will be now possible to keep the books will compensate for what inconvenience may be attendant upon the formalities in obtaining access to them.

The new bookcases that were constructed a year ago were completed so late as to make it impossible to move the books into them last fall. The moving of the books was completed during the past summer and while doing that a rearrangement was made, designed especially for the convenience of research workers. This rearrangement consisted in taking out the bound periodicals from the main collection and placing them in separate series on the main floor of the Library near the catalogue and close by the desks of the reference assistants. The main collection occupies the whole of the second tier of the stack. At the same time the Vail Library was rearranged so that the books in that collection come in juxtaposition with other books on the same subjects. This will be a great advantage in using them. The Vail Librarian has been provided with a desk in the Central Reading Room,

where consultation will be much easier than in the previous location.

The circulation from the Central Library has increased during the year 1921–22 to a marked degree. The total number of books and periodicals issued from the Central Delivery Desk during the year was 20,754, and from the Vail Library 2,615, making a total from the Central Library of 23,369, an increase of 5,285 over the previous year. These figures include only books issued for home use, and do not include the very large number which have been consulted in the stacks and in the Reading Room.

The statistics of circulation from Departmental Libraries are available only in a few cases. From the Department of Architecture the circulation is reported as 3,820 volumes and 4,418 photographs. From the Mining Library there were issued 1,015 volumes for home use, and from the Mathematical Library, 1,273 volumes.

The system of inter-library loans has become of increasing importance and value to us. During the year we have borrowed from other libraries thirty-six volumes, and in return we have loaned one hundred and twenty volumes.

Attendance in the Reading Room during the day has not been recorded, but in the evening from 5 P.M. to 10 P.M. the total attendance from October 1 to June 8 was 9,024.

The reference work, which consists in aiding students and officers in the use of the Library and in helping research workers sent by the contractors on the Technology Plan, and others, has increased in amount and has brought us many gratifying expressions of approval.

Two years ago the first communications were sent to members of the Instructing Staff and to research workers in the Institute asking for information as to the subjects in which they were interested, and offering to supply information in regard to those subjects. The response to these requests was very general, with a result that there are now on file at the Reference Desk nearly 1,000 cards returned in reply to the circulars. During the year 524 communications have been sent out by the Reference Assistant, each one containing from 3 to 20 items of information.

The growth of the Library has progressed steadily: the total accessions for the year being 7,398 items, of which 1,980

were by purchase, 1,417 by the binding of periodicals, and 4,001 were gifts. The gifts included 2,501 pamphlets and 74 maps. After deducting 197 volumes and 232 pamphlets which were lost or worn out, the Libraries of the Institute contained, on June 30, 150,376 volumes and 55,953 pamphlets and maps.

During the year the total number of periodicals currently received was 944, of which 659 were obtained by subscription and 285 as gifts. The estimated annual cost of subscriptions amounted in all to $3,240.85.

The work of the office included the issuing of 2,296 orders for the purchase of new books and 2,119 orders for binding. The cards added to the general catalogue numbered 10,167 and 1,440 were added to the catalogue of the Vail Library, so that after removing obsolete cards the general catalogue contained on June 30, 171,652 cards.

The expense of the Library, aside from salaries, was $12,883.87. It was divided as follows:

For the purchase of books	$4,788.17
For Binding	3,298.44
Subscriptions to Periodicals	3,182.22
Other Library expenses	1,615.04

This is offset by $255.70 taken in for the sale of duplicates and reimbursements for books lost.

The total capital invested in books belonging to the Institute is estimated to be $289,029.13.

Bertha P. Trull, A.B. for many years Principal Assistant, and later Chief Cataloguer and Classifier, has been advanced to the grade of Assistant Librarian, a well merited recognition of faithful and efficient service.

To fill vacancies, Bessie Downs, A.B., a graduate of Barnard College with experience in the Library of the Guaranty Trust Company, of New York was appointed Curator of the Book Stack; and Louise Trainor was promoted to be Assistant in charge of periodicals.

In continuation of her previous gift Mrs. W. T. Sedgwick presented to the Library 47 volumes, which had been part of the private collection of Professor Sedgwick.

From His Excellency the Ambassador of France to the United

States we received three volumes of Le Monde Illustré, and a collection of War Remembrances.

From Colonel Sir Charles Wakefield, Bart. a copy of "Pearl," an English poem of the fourteenth century reset in modern English by Professor Gollancz.

From the Trustees of the Boles Fund 9 volumes for the Library of the Department of Architecture.

In the Central Reading Room are displayed several collections of books presented by students, such as those given by the Latin American Club, which are displayed in a special alcove; 30 volumes which were presented for reference by the students attending the course in Contemporary English Literature (E52); and 10 volumes of Chinese literature in the original language, given by the Chinese Club.

From Lady Scott Moncrieff the life of the distinguished engineer Sir Colin C. Scott-Moncrieff, which is of special interest to those who remember his Lowell lectures delivered in Huntington Hall some years ago.

An especially notable gift is one made by Samuel S. Dale, editor of "Textiles," containing 115 volumes and 45 pamphlets on various subjects in connection with the textile industry. These are books of both practical and historical interest and many of the volumes are probably rare in this country.

From the Editor of the *Technology Review* we received a number of valuable books mostly by the Alumni.

Dr. William Thornton Parker, whose son William Thornton Parker, Jr., graduated in the class of '97, has presented a copy of his valuable book "Gleanings from Colonial and American Records of the Parker and Morse Families."

Other gifts especially worthy of mention are listed below:

Donors and Gifts

Professor H. P. Talbot. — Quantitative Chemical Analysis — Figulus: Golden and Blessed Casket of Nature's Marvels: Collectanea Chemica: Alchemical Writings of Edward Kelly: Leitfaden der Quantitativen Analyse: World Metric Standardization.

Dr. C. E. Ruby, — Colonel Todhunter of Missouri — Shaw's Peace Conference Hints.

D. R. Shotwell, '23, and F. L. McDonough, '22. — Robinson, A. G.: Old New England Doorways.

Italians of the United States. — Opere di Dante.

Professor William Emerson. — A leaf of the Gutenberg Bible: 2 volumes Moore's Daniel H. Burnham.

Professor Tenney L. Davis. — Davis, T. L.: Sanity of Hamlet.
Professor H. O. Hofman. — Hofman, H. O.: Metallurgy of Zince and Cadimum.
I. Georgevitch, '22. — Strajnic, K.: Iron Mestrovic.
A. E. Hansen, '02. — Hansen, A. E.: Plumbing Fixture Traps.
Professor J. R. Jack. — Blocksidge: Life-saving Appliances on Cargo and Passenger Vessels: Abell, W.: Safety of Life at Sea.
Dr. S. Burt Wolbach. — Wolbach and others: Etiology and Pathology of Typhus.
Percy Paul Pratt, '23. — Industrial Stability.
Charles V. Briggs, '21. — Pound, Arthur: The Iron Man in Industry.
Donald W. McArdle. '18. — The Lowell Book, 1922.
A. N. Brown, '80. — Photographs of the Class of 1880.
Stone & Webster Co. — 11 volumes of electrical and chemical literature.
Professor C. H. Warren. — Ford: Dana's Manual of Mineralogy: Dana: First Appendix to 6th edition of Dana's System of Mineralogy.
Technique Board of 1923. — 1923 Technique.
Professor C. E. Turner. — Holt: Food, Health and Growth.
Fay, Spofford and Thorndike. — Dedication of Hampden County Memorial Bridge.
Dr. M. P. Horwood. — 2 volumes, Horwood, M. P.: Public Health Surveys.

ROBERT P. BIGELOW.

REPORT OF THE DEAN OF STUDENTS

The past year has been noteworthy in the life of the Institute, as the first since the inauguration of the office of Dean of Students in which the duties of the office have not been actively administered by Professor Alfred E. Burton. Dean Burton relinquished active service in June, 1921 and retired on April 1, 1922, being on leave of absence during the intervening period. Beginning in 1902, without guiding precedents, and with a student body widely scattered as to residence and lacking adequate social centers for student activities, he quietly and patiently built up a remarkable structure of student self-government and an earnest spirit of self-control, and at the same time exercised rare judgment in his sympathetic and just handling of his academic contacts, especially in his supervision of first year students. The tributes of affection and respect which marked the closing days of his his residence at the Institute told their own story. Dean Burton's spirit and service will "carry on" in the lives of thousands of young men.

The great increase in attendance has made it impossible for one person to care adequately for the details of the Dean's office. An Acting Dean was appointed to serve during Dean Burton's leave of absence and also an Acting Assistant Dean. Professor

Talbot was appointed to the first of these offices and Mr. Harold E. Lobdell to the second. Both appointments were made permanent in April, 1922.

It has been the purpose of the new officers to preserve for the present continuity of the policy recently adopted by Dean Burton, and they have been fortunate in receiving hearty coöperation, both from the members of the Instructing Staff and from the leaders in the student activities. Certain minor changes in the procedures for the consideration of student records have been introduced, and a Committee on Policy has been appointed from the Faculty, having as its objective a careful and critical study of the present methods of instruction and discipline with respect to the First Year and Junior First Year classes. This committee will consider the recommendations made by Professor Burton in his Report of last year.

The space allotted to the Dean's Office has been increased as a part of the general rearrangement and expansion of the administrative offices.

For some years Professor Burton was in charge of the Department of Physical Training, but with the enlargement of the scope of the Medical Department the continuation of a separate Department of Physical Training has become unnecessary. It has, therefore, been combined with the former Medical Department, the new organization to be known as the Department of Hygiene, under the charge of Dr. George W. Morse, the Medical Director. The Dean is a member of the new Department, as is also Mr. Frank Kanaly, who continues his excellent service under the title of Director of Physical Training. Plans are now under consideration for the better adaptation of the training in physical development to the needs of individual students.

Of all the problems relating to student welfare that of the provision of many more dormitory accommodations still takes first rank. Its urgency cannot be too often or earnestly reiterated.

H. P. Talbot.

REPORT OF THE REGISTRAR

I present the following as my twentieth annual report as Registrar. Because I have accepted an opportunity to engage in a new field of activity, this is likewise my final report as Registrar.

The tables of statistics are fashioned after those originally designed by President Francis A. Walker; some of his have been omitted; some on account of changed conditions have been modified, and new ones, as occasions have arisen, have been added. The purpose of these tables has been to give a history of the growth and development of the Institute, and to provide for the executive officers, statistics to help in forwarding plans for the future development of the Institute as well as to help in the annual planning of the budget.

The registration for the past year was greater than at any other time in the history of the Institute, although its gain over the previous year was not as great as that of a year ago. It was in percentage a gain of a trifle more than 2%. The number of students on November 1 was 3,505.

The total number of active members of the Instructing Staff rose to 394, an increase of 19 over the year previous. The ratio of the number of instructors to the number of students was once more 1.9, similar to that of the year previous.

In the student registration, those associated with the fourth year class formed the largest group, numbering 961. The other groups by classes are smaller in each case than they were a year ago, and on this account in making an estimate of the students for the coming year, while in my opinion the first year class is likely to be somewhat larger than for the past year (and during this past year it was practically the size of the year before), the loss of this very large senior class will not be made up by a sufficient increase in the first year class. The number of candidates for advanced degrees is distinctly higher than at any previous time. It numbered for the past year 208 as compared with 176 of the year previous.

The order in size of the different professional Courses has been somewhat changed from that of the past. Electrical Engineering, with its sub-division of the Coöperative Course in Electrical Engineering, makes this department the largest in the

school. It is followed by Mechanical Engineering with a difference in the totals of 77 students. Closely following Mechanical Engineering comes the Course in Engineering Administration. The next in size is Chemical Engineering including its school in Chemical Engineering Practice. The Course in Civil Engineering is next in size and comes as usual among the first five Courses arranged in the order of their size. These several Courses all have 300 or more students. Another group with about one hundred students each arranged in order of their size is Architecture, Mining Engineering, Chemistry, and Electrochemical Engineering. Of the remaining Courses, that in Naval Architecture is the largest. The Course in Biology and the two Courses in General Science show distinct gains. There is a slight drop in the total number of students in the Engineering Courses, while students in the Science Courses have gained in number and the gain of 31 is larger in proportion here than is the drop of 55 students in Engineering.

The number of students from other colleges while amounting to 476 is not an increase over the number of the year previous. The falling off may be due to the greater rigidity practised by the Committee on Admissions. Similarly the total number of college students in the Institute for the past year was somewhat less than the year before, although the number of college graduates was larger. The loss was among the students who came from other colleges but were not graduates. Among the professional Courses, the increase of college students is noted in Mechanical Engineering, Chemistry, General Engineering, Chemical Engineering Practice and Geology. The number of women students has increased from 38 to 45. The increase is in the first and the third year classes.

In reviewing the geographical distribution of students for the past year, it is interesting to note that the percentage increase of foreign students, while it was greater than that of the whole student body the year previous, has now dropped slightly to less than the percentage increase of the whole student body, making the gain in the percentage of students from the United States and its districts slightly larger in proportional gain than the percentage gain of the student body as a whole. The number of Chinese students is still the largest and has gained over last

year. There are now 60. The delegation from Canada follows them in order of numbers, while the third in order is once more the group of students coming from Norway. The only other sizable groups are those of Mexicans and Russians. The percentage of foreign students is still high in comparison with that at other colleges. Foreign students compose more than 7½% of the student body. Among the United States students, there are increases in all districts except the North Central District. In that district there is a slight loss of 23 students with a total of 314. The losses are from the states of Ohio and Wisconsin. Among the other districts the greatest gains are from Pennsylvania, Maryland, Tennessee, Texas, California and Colorado. Every state except Nevada is represented and there are students from all territories and districts.

The age of the graduating class has not been calculated this year as this class is made up of so many who were interrupted in their educational program by the war. The age of the first year class is 19 years and 2 months, the same as for last year. This is larger by a few months than it was ten years ago when it was 18 years and 10 months.

During the past year the admission of a Junior Grade First-Year Class was resumed and 73 students were admitted. With these students a larger class was formed by the dropping back of some of the first year students who had not been successful enough in their studies to go on regularly with the first year class. Together they formed a class of approximately 114.

The Scholarship Committee of the Faculty recommended awards of $46,905 to undergraduate students. There were 383 applicants for scholarship aid; 236 received awards from the Institute.

In the graduating class this year 636 received the Bachelor's degree, whereas in 1902 the graduating class numbered just under 200 or 192.

The number of alumni who hold Institute degrees has risen to the mark of 9,281. Twenty years ago it was 2,727. The number of former students at this date exceeds eighteen thousand.

The usual tables of statistics follow.

WALTER HUMPHREYS.

The Corps of Instructors

November 1	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21
Professors: Emeriti	1	1	1	1	1	1	1	3	3	3	4	4	4	5	5	5	6	5
Retired	—	—	—	1	1	1	1	3	3	3	4	5	7	7	6	6	6	7
Non-Resident	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2
Research (Not counted elsewhere)	—	—	—	—	—	—	—	4	3	1	1	—	—	—	—	—	—	—
Total	4	4	4	5	5	5	5	13	12	10	12	12	13	14	13	13	14	14
Professors	25	32	36	39	39	43	43	40	47	46	59	63	61	59	58	52	56	56
Associate Professors	17	14	17	17	17	14	18	17	16	23	23	23	30	32	29	33	34	35
Assistant Professors	19	24	21	24	32	31	30	33	35	33	36	31	36	38	33	39	49	54
Instructors (Members of Faculty)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25
Active Faculty	61	69	74	80	88	88	91	90	98	102	118	117	127	129	120	124	139	170
Instructors (Not members of Faculty)	67	72	69	72	62	69	66	64	67	74	70	79	90	70	67	99	109	84
Assistants	56	53	52	52	50	51	55	50	49	54	52	58	54	38	35	39	79	93
Faculty, Instructors and Assistants	184	184	215	204	200	208	212	204	214	230	240	254	271	237	222	262	327	347
Research Associates	—	6	8	8	6	12	8	5	3	1	3	3	5	4	1	8	19	19
Research Assistants	—	4	3	3	1	1	5	6	7	8	15	11	14	7	5	10	15	13
Lecturers	33	39	31	32	31	18	21	25	16	19	23	28	31	29	13	13	14	15
Total Active Members	217	332	257	247	238	239	246	240	240	258	281	296	321	277	241	293	375	394

Yearly Registration Since the Foundation of the Institute

Year	Number of Students	Year	Number of Students	Year	Number of Students
1865–66	72	1884–85	579	1903–04	1,528
1866–67	137	1885–86	609	1904–05	1,561
1867–68	167	1886–87	637	1905–06	1,466
1868–69	172	1887–88	720	1906–07	1,397
1869–70	206	1888–89	827	1907–08	1,415
1870–71	224	1889–90	909	1908–09	1,462
1871–72	261	1890–91	937	1909–10	1,481
1872–73	348	1891–92	1,011	1910–11	1,509
1873–74	276	1892–93	1,060	1911–12	1,566
1874–75	248	1893–94	1,157	1912–13	1,611
1875–76	255	1894–95	1,183	1913–14	1,685
1876–77	215	1895–96	1,187	1914–15	1,816
1877–78	194	1896–97	1,198	1915–16	1,900
1878–79	188	1897–98	1,198	1916–17	1,957
1879–80	203	1898–99	1,171	1917–18	1,689
1880–81	253	1899–00	1,178	1918–19	1,819
1881–82	302	1900–01	1,277	1919–20	3,078
1882–83	368	1901–02	1,415	1920–21	3,436
1883–84	443	1902–03	1,608	1921–22	3,505

The Students, 1921–1922

Registration by Classes	Total
Candidates for advanced degrees	208
Fourth year	961
Third year	831
Second year	678
First year	686
School of Public Health	20
Army	43
Special	78
Total	3,505

Students by Courses for the Year, 1921–1922

Year	Civil Engineering	Mechanical Engineering	Mining Engineering and Metallurgy	Architecture	Chemistry	Electrical Engineering	Electrical Engineering VI-A	Biology and Public Health	Physics	General Science	General Engineering	Chemical Engineering	Chemical Engineering Practice X-A	Chemical Engineering Practice X-B	Sanitary Engineering	Geology and Geological Engineering	Naval Architecture	Naval Construction	Electrochemical Engineering	Engineering Administration	Aeronautical Engineering	Mathematics	Total
Graduate	9	16	5	1	51	22	—	2	12	—	—	25	36	—	—	5	1	10	3	—	9	1	208
Fourth year	80	198	33	52	15	88	67	10	8	1	23	114	—	16	9	10	22	22	28	164	1	—	961
Third year	81	140	35	44	18	104	38	9	14	3	9	123	—	—	1	5	22	—	24	161	—	—	831
Second year	72	116	30	18	11	97	53	5	5	2	8	80	—	—	2	—	17	—	23	139	—	—	678
First year	70	110	18	26	11	188	—	4	2	2	7	98	—	—	4	2	16	—	20	108	—	—	686
School of Public Health	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20
Army	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43
Special	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	78
Total	312	580	121	141	106	500	157	30	41	8	47	440	36	16	16	22	78	32	98	572	10	1	3,505

Totals of the Same Classification* Since 1911

Year	Engineering Courses												Total of Engineering Courses	Architecture	Science Courses						Total of Science Courses	School of Public Health	Special	Army
	Civil Engineering	Mechanical Engineering	Mining Engineering	Electrical Engineering (Inc. VI-A)	Chemical Engineering (Inc. X-A and X-B)	Sanitary Engineering	Naval Architecture	Naval Construction	Electrochemical Eng.	Engineering Administration	Aeronautical Eng.	General Engineering			Chemistry	Biology	Physics	Geology	General Science	Mathematics				
1911–12	217	214	79	203	129	57	19	8	35	—	—	—	961	112	56	20	4	2	3	—	82	—	—	—
1912–13	212	243	50	201	149	55	29	6	42	—	—	—	987	127	60	33	5	2	4	—	100	—	—	—
1913–14	209	279	37	196	141	65	31	7	38	—	—	—	1,003	130	78	36	12	3	3	—	129	—	—	—
1914–15	197	271	34	205	146	61	25	16	46	57	—	—	1,057	157	66	44	10	3	5	—	123	—	—	—
1915–16	188	279	46	235	157	60	28	23	50	99	—	—	1,165	163	59	48	14	4	4	—	125	—	—	—
1916–17	172	270	55	233	173	31	38	26	42	139	—	—	1,179	142	60	61	11	9	4	—	144	—	—	—
1917–18	160	210	40	186	164	21	40	—	37	119	6	—	983	80	45	37	10	3	1	1	95	—	—	—
1918–19	111	172	40	135	155	9	75	6	16	67	81	—	867	27	33	49	6	1	—	1	116	—	—	—
1919–20	255	472	103	305	381	24	66	18	74	375	2	33	2,108	119	66	56	15	15	—	1	152	—	—	—
1920–21	377	651	140	561	526	15	95	30	105	529	7	34	3,070	130	93	24	42	19	8	2	318	25	33	—
1921–22	312	580	121	657	492	16	78	32	98	572	10	47	3,015	141	106	30	41	22	8	1	349	20	78	43

*Previous to 1920–1921 the election of Courses by first-year students was not recorded.

Students at the End of the School Year for the Past Seven Years

	1916	1917	1918	1919	1920	1921	1922
Engineering Courses							
Civil	234	225	212	240	310	343	290
Mechanical	337	340	270	400	573	605	586
Mining	56	67	63	78	133	130	110
Electrical	282	290	224	252	406	496	635
Chemical	200	267	258	350	428	491	431
Sanitary	69	40	22	16	26	18	13
Naval Architecture	62	74	83	78	96	104	97
Electrochemical	63	55	44	43	108	101	90
Engineering Administration	146	199	150	228	467	511	541
Aeronautical	—	—	—	2	2	6	14
General Engineering	—	—	—	—	29	43	51
Total Engineering	1,449	1,557	1,326	1,687	2,578	2,848	2858
Architecture	173	163	74	67	144	136	149
Science Courses							
Chemistry	72	66	52	58	72	96	102
Biology	51	63	35	19	47	24	38
Physics	15	11	12	15	23	41	41
Geology	5	7	3	4	14	20	28
General Science	4	5	2	2	—	5	8
Total Science Courses	147	152	104	98	156	186	217
Special and No Course Classification	17	20	130	8	6	61	105
School of Public Health	—	—	—	—	—	18	—
Grand Total	1,786	1,892	1,634	1,860	2,884	3,249	3329

Number of Students in Each Year, from 1911, Coming from Each State or Territory

States and Territories	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921
North Atlantic:	1,152	1,212	1,279	1,394	1,434	1,502	1,316	1,436	2,261	2,415	2,460
Connecticut	45	44	45	55	61	69	49	59	101	104	102
Maine	25	24	25	32	23	32	26	34	58	66	62
Massachusetts	860	890	954	1,032	1,060	1,110	1,005	1,020	1,517	1,516	1,544
New Hampshire	29	28	34	34	27	30	26	28	48	41	45
New Jersey	33	34	38	48	54	53	47	58	113	123	122
New York	90	108	102	113	121	122	101	140	264	341	346
Pennsylvania	39	43	42	42	46	57	31	58	113	143	160
Rhode Island	25	33	34	31	35	17	19	26	42	54	49
Vermont	6	8	5	7	7	12	12	11	15	27	30
South Atlantic:	49	45	66	66	72	81	43	50	129	160	166
Delaware	1	2	2	3	5	4	7	3	14	15	12
District of Columbia	13	12	21	18	19	27	10	14	37	37	38
Florida	2	3	5	2	5	7	1	6	10	14	14
Georgia	3	3	4	3	5	5	3	2	8	8	11
Maryland	8	8	16	18	13	9	4	7	13	18	33
North Carolina	1	2	4	2	4	5	4	2	9	11	7
South Carolina	3	—	5	6	9	9	4	3	5	8	7
Virginia	15	13	8	11	8	8	6	9	24	36	35
West Virginia	3	2	1	3	4	7	4	4	9	13	9
South Central:	48	46	43	50	54	49	42	41	79	91	115
Alabama	6	3	5	5	5	5	6	5	12	4	8
Arkansas	2	2	1	2	1	1	—	—	1	6	7
Kentucky	8	7	10	10	8	9	6	5	14	20	22
Louisiana	4	4	5	5	7	7	5	5	10	9	6
Mississippi	8	7	5	6	5	2	4	2	6	5	10
Tennessee	3	2	2	5	5	8	3	3	10	12	20
Texas	17	21	15	17	23	17	18	21	26	35	42
North Central:	141	137	115	115	152	146	124	118	271	337	314
Illinois	30	25	15	27	37	31	27	19	49	67	66
Indiana	9	10	9	7	12	5	9	10	18	27	27
Iowa	9	8	11	10	12	6	1	5	15	18	18
Kansas	7	8	3	4	2	3	1	3	7	6	5
Michigan	9	7	12	14	15	16	14	19	26	29	26
Minnesota	7	14	15	6	5	6	4	5	18	24	31
Missouri	12	13	3	5	10	18	15	14	37	35	33
Nebraska	8	8	8	5	5	5	3	1	4	11	11
North Dakota	3	3	2	3	3	1	—	—	2	4	5
Ohio	37	32	25	28	44	43	42	34	68	85	67
South Dakota	2	2	2	1	3	1	1	—	2	2	5
Wisconsin	8	7	10	5	4	11	7	8	25	29	20
Western:	57	65	63	72	59	52	46	42	120	139	150
Alaska	—	1	1	—	—	—	1	—	—	—	1
Arizona	1	1	—	—	—	1	—	1	2	5	3
California	23	22	23	30	25	22	16	14	41	47	51
Colorado	11	14	13	14	11	8	7	7	26	23	28
Idaho	—	—	1	2	1	2	1	—	1	4	4
Montana	2	4	4	3	2	1	3	6	8	8	9
Nevada	—	—	—	—	—	—	—	—	1	1	—
New Mexico	—	1	1	1	1	—	—	—	4	4	4
Oklahoma	—	1	2	—	—	1	—	2	3	2	5
Oregon	11	14	11	10	5	6	6	7	9	11	14
Utah	3	2	2	—	5	5	5	—	5	10	8
Washington	6	6	5	10	7	4	4	5	15	20	21
Wyoming	—	—	—	—	2	2	3	—	5	4	2

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921
Districts	11	6	6	5	4	5	4	5	13	27	29
Canal Zone	—	—	—	—	—	—	—	1	1	2	2
Hawaii	3	2	1	2	1	—	1	1	—	3	4
Philippine Islands	3	1	2	1	1	2	—	—	7	11	14
Porto Rico	5	3	3	2	2	3	3	3	5	11	9
Total for United States	1,458	1,511	1,572	1,702	1,775	1,835	1,575	1,692	2,873	3,169	3,234

NUMBER OF STUDENTS IN EACH YEAR, FROM 1911, COMING FROM EACH FOREIGN COUNTRY

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921
Foreign Counrries	101	100	113	114	125	122	123	127	205	267	271
Albania	—	—	—	—	—	—	1	—	—	—	1
Argentine Republic	2	1	—	—	1	1	1	—	3	5	7
Armenia	—	—	—	—	—	—	—	2	3	2	—
Australia	1	—	—	—	—	—	—	—	2	1	—
Austria-Hungary	1	2	1	2	1	1	1	—	—	—	—
Belgium	—	—	—	—	—	—	—	—	—	2	5
Bolivia	—	—	—	—	—	—	—	—	—	—	1
Brazil	3	5	7	4	1	1	4	2	4	7	5
Bulgaria	—	—	—	—	1	—	—	—	—	1	1
Canada	19	13	14	15	14	16	10	10	38	41	42
Cape Colony	1	—	—	1	—	—	—	—	—	—	—
Chile	1	—	1	—	—	8	10	6	7	8	6
China	36	37	42	46	49	40	42	38	40	58	60
Colombia	—	—	1	3	4	3	2	4	6	2	1
Costa Rica	1	—	1	—	—	1	1	1	1	1	—
Cuba	3	6	7	3	2	8	6	5	4	8	8
Cyprus, Island of	—	—	—	—	1	—	—	—	—	—	—
Czechoslovakia	—	—	—	—	—	—	—	—	—	3	1
Denmark	1	—	2	1	1	1	3	1	1	3	4
Dutch West Indies	—	—	—	—	—	—	—	—	—	1	2
Ecuador	1	1	1	—	—	1	1	4	2	1	—
Egypt	2	1	1	1	1	1	1	—	1	—	—
England	1	—	—	1	1	1	—	—	1	3	8
Finland	—	—	—	—	—	—	—	—	—	—	—
France	2	3	4	2	—	—	—	—	2	2	3
Germany	2	3	2	2	3	1	—	—	—	—	—
Greece	1	1	1	1	—	—	2	3	2	4	3
Guatemala	—	1	1	2	1	—	1	—	—	1	—
Honduras	2	—	1	1	2	3	3	—	1	—	—
India	—	2	1	2	2	1	—	—	2	6	5
Ireland	—	—	—	—	—	—	—	—	1	1	1
Italy	—	—	—	—	1	2	—	—	1	—	1
Jamaica	1	—	—	—	—	—	—	—	—	—	1
Japan	3	—	1	1	6	8	11	15	10	12	6
Korea	—	2	—	—	—	—	—	—	—	1	1
Mexico	5	4	7	7	10	9	5	5	9	18	15
Newfoundland	1	1	1	—	—	—	—	—	—	—	—
New Zealand	2	1	—	—	—	—	—	—	—	—	—
Nicaragua	—	—	—	—	2	—	—	—	—	—	1
Norway	—	—	—	—	2	3	6	12	38	30	21
Palestine	—	—	—	—	—	—	—	—	—	1	1
Paraguay	1	1	1	1	—	—	—	—	—	—	1
Peru	1	—	2	3	3	—	2	—	3	3	3
Portugal	—	—	1	—	1	—	—	—	—	—	—
Roumania	—	—	—	—	—	—	—	—	—	—	1
Russia	3	4	4	5	2	2	1	10	8	12	15
Salvador	—	1	1	1	3	1	—	—	—	—	—
Scotland	—	—	1	1	—	—	—	—	1	1	1
Serbia	—	—	—	—	—	—	—	—	—	—	1
Siam	—	—	—	—	1	1	—	—	5	8	8
Smyrna	—	—	—	—	—	—	—	—	—	1	1
South Africa, Union of	—	1	1	—	1	—	—	1	2	4	5
Spain	—	—	—	—	—	—	2	4	2	5	4
Straits Settlements	—	—	—	—	—	—	—	1	—	1	—
Sweden	—	—	—	—	—	—	2	—	—	2	1
Switzerland	1	—	—	—	—	—	—	—	1	—	6
Syria	2	3	2	2	—	1	—	—	—	—	2
Tahiti	—	—	—	—	—	—	—	—	—	—	1
Turkey	1	5	3	6	8	6	5	1	1	1	2
Uruguay	—	—	—	—	—	—	5	2	3	6	9
Total in School	1,559	1,611	1,685	1,816	1,900	1,957	1,698	1,819	3,078	3,436	3,505

WOMEN STUDENTS, 1921–1922

Year	COURSE												
	Mining Engineering	Architecture	Chemistry	Electrical Engineering	Biology and Pub. Health	Physics	General Science	General Engineering	Chemical Engineering	Elec.-chem Engineering	School of Pub Health	Special	Total
First	—	4	1	1	1	1	1	—	—	—	—	—	9
Second	—	1	3	—	—	—	—	—	—	—	—	—	4
Third	1	2	—	—	—	—	—	—	1	—	—	—	4
Fourth	—	6	4	—	—	1	—	1	—	1	—	—	13
Graduate	—	—	—	—	1	6	—	—	—	—	6	—	13
Special	—	—	—	—	—	—	—	—	—	—	—	2	2
Total	1	13	8	1	2	8	1	1	1	1	6	2	45

TOTAL REGISTRATION AND NUMBER OF NEW STUDENTS

Year	(1) Total Number of Students	(2) Number of Students of the previous year who remain in the Institute	(3) Number of New Students	(4) Number of New Students Entering from Other Colleges
1920–1921	3,436	2,080	1,356	608
1921–1922	3,505	2,151	1,354	476

GRADUATE STUDENTS, 1921–1922

American Colleges and Universities Represented

	1916–17	1917–18	1918–19	1919–20	1920–21	1921–22
Adelphi	—	—	—	—	—	1
Akron	—	3	—	1	1	2
Alabama	2	2	—	—	—	6
Alabama Polytechnic Inst.	2	1	—	2	1	—
Alfred	—	1	—	1	—	—
Allegheny	—	1	—	1	1	1
Amherst	10	3	1	5	1	1
Arizona	—	1	—	2	—	—
Arkansas	—	—	—	—	2	—
Armour Institute of Tech.	2	1	—	—	—	1
Assumption	—	—	—	1	—	—
Austin	—	—	—	1	—	1
Baker	—	—	—	2	2	—
Bates	4	3	—	2	3	4
Baylor	1	—	—	—	—	1
Bellevue	1	—	—	—	—	—
Beloit	2	2	—	1	1	1
Bethany	—	1	—	—	—	1
Biddle	—	—	—	—	—	1
Birmingham-Southern	—	—	—	—	1	1
Boston College	3	1	1	6	8	10
Boston University	4	2	1	2	—	4
Bowdoin	4	—	1	3	3	4
Brooklyn Polytechnic Inst.	2	1	—	1	—	—
Brown	2	2	—	3	8	7
Bryn Mawr	—	—	—	4	3	5
Bucknell	—	—	—	2	—	—
Buffalo	—	1	—	1	1	1
Butler	—	—	—	—	—	1
California	7	4	—	1	3	5
Campion	—	—	—	2	1	—
Canisius	1	—	1	1	1	1
Carleton	—	—	—	1	3	3
Carnegie Institute of Technology	1	1	—	1	1	—
Case School of App. Science	6	1	—	—	—	—
Catholic University of Am.	5	3	1	—	—	—
Central (Fayette, Mo.)	—	—	—	—	1	—
Centre	—	—	—	1	1	—
Charleston	1	—	—	—	—	—
Chicago	1	1	—	1	1	2
Cincinnati	1	1	1	1	—	1
City of New York	3	7	—	5	9	9
Clark	1	1	2	3	4	3
Clarkson	—	—	—	1	—	—
Clemson Agricultural	—	—	—	—	1	1
Colby	3	2	—	2	4	2
Colgate	2	3	1	—	4	5
Colorado Agricultural	1	—	—	—	—	—
Colorado College	1	—	—	—	1	2
Colorado School of Mines	1	1	—	—	—	—
Colorado University	1	1	—	3	2	2
Columbia	6	3	4	4	5	7
Cooper Union	1	—	—	—	1	1
Cornell University	9	8	5	4	5	5
Cornell (Iowa)	—	1	—	—	—	—
Cotner	1	—	—	—	1	1
Dartmouth	22	15	1	11	12	12
Davidson	—	1	1	1	2	1
Davis and Elkins	1	1	—	—	—	—
Delaware	—	1	—	3	4	—
Denison	2	2	—	—	—	1
Denver	2	1	—	—	—	—
Dickinson	—	—	—	—	—	1
Drake	1	—	—	1	1	—
Drury	2	—	—	—	—	—
Earlham	—	—	—	—	1	—
Fairmount	—	—	—	—	—	1
Fargo	1	—	—	—	—	—
Fordham	—	—	—	1	1	2
Franklin and Marshall	1	—	—	2	1	1
Friends	—	—	—	—	—	1
Furman	—	1	—	—	—	—
Geneva	1	—	—	—	—	—
Georgetown	2	1	—	—	—	1
George Washington	—	1	—	1	1	—
Georgia	1	—	—	1	1	—
Georgia School of Tech.	4	2	—	1	1	2
Gonzaga	1	—	—	—	—	—
Goucher	—	—	1	—	—	—
Grinnell	2	—	—	2	5	3
Hahnemann Medical	—	—	—	—	1	—
Hamilton	4	2	—	3	3	3
Hanover	—	—	—	—	1	1
Harvard	46	27	4	21	19	14
Haverford	3	—	—	1	4	7
Hillsdale	—	—	—	—	1	1
Hobart	1	—	—	2	1	—
Holy Cross	1	3	—	3	3	2
Howard	—	—	—	—	—	2
Idaho	—	—	—	—	1	1
Illinois	5	4	1	1	4	3
Indiana Medical	—	1	—	—	—	—
Indiana University	—	—	—	1	2	4
Iowa State	2	—	1	1	1	1
Jefferson Medical	—	—	—	—	2	—
John B. Stetson	2	—	—	—	—	—
Johns Hopkins	1	—	—	1	1	3
Kalamazoo	2	2	—	1	1	1
Kansas	2	4	—	3	2	2
Kentucky	1	1	1	1	—	1
Kenyon	—	—	—	—	—	1
Lafayette	1	—	—	—	—	—
Lake Forest	1	2	—	—	—	—
Lawrence	1	1	—	1	3	2
Lehigh	4	5	—	—	2	—
Leland Stanford Junior	2	1	—	2	1	3
Lewis Institute	—	—	—	1	—	—
Lincoln	1	—	—	—	—	—
Lombard	1	1	—	—	—	—
Louisiana State	1	1	—	1	1	1
Louisville	1	—	—	—	—	—
Loyola	1	1	—	1	3	2
McMaster University	—	1	—	—	—	—
Maine	7	2	1	1	1	2
Manhattan	—	1	1	1	1	1
Marion Institute	—	—	—	1	—	1
Maryville	1	1	—	—	—	—
Massachusetts Agricultural	6	3	—	2	—	—
Mass. Institute of Tech.	16	14	8	16	47	68
Mercer	—	1	—	—	—	1
Miami	2	3	—	—	1	—
Michigan	4	2	2	3	1	6
Michigan Agricultural	—	—	—	1	1	—
Michigan College of Mines	1	—	1	—	—	—
Middlebury	2	—	1	1	2	2
Millsaps	—	1	—	—	—	—
Minnesota	3	2	1	1	3	6
Mississippi	—	1	—	2	2	2
Mississippi Agricultural and Mechanical	2	—	—	—	1	1
Missouri	3	2	—	1	2	3
Missouri Wesleyan	—	—	—	—	—	1
Monmouth	1	—	—	—	—	—
Montana	—	1	—	—	—	—
Montana School of Mines	—	1	—	—	—	—

GRADUATE STUDENTS, 1921–1922 — *Continued*
American Colleges and Universities Represented

	1916–17	1917–18	1918–19	1919–20	1920–21	1921–22
Moore's Hill	1	1	—	—	—	—
Mount Holyoke	1	—	1	1	3	2
Nebraska	1	1	—	2	1	1
Nebraska Wesleyan	—	—	—	—	2	—
Newberry	1	—	—	—	—	—
New Hampshire Agricultural and Mechanical	1	1	—	—	1	2
New Mexico	—	—	—	—	1	1
New York University	2	1	—	—	—	—
North Carolina	6	4	—	3	3	1
North Dakota Agricultural	—	—	—	1	2	1
Northeastern	—	—	—	—	—	2
Northwestern	3	1	—	2	4	6
Norwich	4	1	—	—	—	1
Notre Dame	2	4	1	—	—	—
Oberlin	5	—	—	1	3	2
Occidental	1	2	—	—	—	—
Ogden	1	—	—	—	—	—
Ohio State	2	—	—	1	2	1
Ohio University	1	—	—	—	—	—
Ohio Wesleyan	1	1	—	1	—	—
Oklahoma Agr. and Mech.	1	—	1	—	—	—
Oklahoma University	—	—	—	—	1	—
Oregon	—	1	1	3	5	2
Oregon Agricultural	1	3	2	3	—	2
Pacific	—	—	—	—	—	1
Pennsylvania (Gettysburg)	2	—	—	—	2	3
Pennsylvania State	3	—	2	3	1	5
Pennsylvania University	10	5	—	4	2	4
Pittsburgh	—	1	1	—	1	2
Pomona	—	1	—	—	2	1
Pratt Institute	—	—	—	—	—	1
Princeton	9	4	2	4	11	16
Purdue	3	2	1	—	1	1
Radcliffe	4	4	7	1	1	2
Randolph-Macon	—	—	—	—	1	—
Reed	1	—	—	—	1	2
Rensselaer Polytechnic Inst	3	1	1	—	—	—
Rhode Island State	1	1	—	—	—	1
Rice Institute	1	1	—	—	4	2
Rochester	7	4	—	—	1	3
Roger Williams	—	—	—	—	—	1
Rose Polytechnic Institute	—	4	1	1	1	—
Rutgers	1	—	—	1	—	—
Rush Medical College	—	1	—	—	—	—
Sacred Heart	—	—	—	—	—	1
Saint Anne	1	—	—	—	—	—
St. Anselm	1	1	—	—	—	—
St. Elizabeth	—	—	—	1	—	—
Saint Francis Xavier	1	1	—	—	—	—
St. Joseph's (Philadelphia)	—	—	1	—	—	—
St. Louis	—	—	—	—	1	1
Saint Mary's	—	—	—	2	2	—
Saint Olaf	1	—	—	2	—	—
Simmons	—	—	1	—	—	—
Simpson	—	—	—	—	—	1
Smith	—	1	1	—	—	—
South Carolina	2	—	—	1	1	—
South Carolina Military	3	3	—	1	1	1
South Dakota School of Mines	—	—	—	—	—	1
South Dakota	—	—	—	—	—	2
Southwestern	—	—	1	—	—	—
Spring Hill	1	—	2	2	2	3
Stevens Institute of Tech.	—	3	1	—	—	—
Swarthmore	—	—	—	—	—	2
Syracuse	2	1	—	—	2	1
Tennessee	1	1	—	—	—	—
Texas	3	4	1	1	5	4
Texas, Agr. & Mech. Coll. of	4	2	—	1	—	1
Texas Military	—	—	—	—	—	1
Throop	2	—	—	1	1	1
Transylvania	—	—	—	—	3	1
Trinity (Hartford, Conn.)	—	1	—	1	—	2
Trinity (Washington, D. C.)	2	1	—	—	—	—
Tri State	—	—	—	—	—	1
Tufts	14	7	—	3	3	4
Tulane	1	1	—	1	2	—
Union	2	3	—	—	—	—
U. S. Military Academy	3	1	—	5	45	32
U. S. Naval Academy	22	1	6	6	32	39
University of the South	1	—	—	—	—	—
Ursinus	1	—	—	—	1	1
Utah	2	3	—	1	1	1
Utah Agricultural	1	—	—	—	—	—
Valparaiso	1	1	—	—	—	—
Vanderbilt	1	1	1	1	2	1
Vassar	—	—	—	—	1	2
Vermont	2	3	—	—	2	1
Virginia	3	3	—	5	6	6
Virginia Military	5	4	1	3	9	8
Virginia Polytechnic Inst.	—	—	—	1	2	—
Wabash	—	—	—	1	2	3
Washburn	3	—	—	2	2	—
Washington	6	2	—	1	4	2
Washington (St. Louis)	—	1	—	—	—	—
Washington and Jefferson	2	1	—	2	2	1
Washington and Lee	4	3	6	3	2	1
Washington State	1	—	—	1	—	—
Wellesley	—	2	2	1	2	3
Wesleyan	7	5	2	1	—	—
Western Maryland	—	—	—	—	1	2
Western Reserve	1	1	—	—	1	1
Westminster (Colo.)	—	—	—	—	1	2
Whitman	—	1	—	—	2	1
William Jewell	—	1	—	—	—	1
William and Mary	1	—	—	—	—	—
Williams	10	5	—	4	5	5
Wisconsin	4	4	1	—	—	1
Wittenberg	—	—	—	—	1	1
Wofford	1	—	1	—	1	—
Wooster	3	1	—	1	1	—
Worcester Polytechnic	9	11	2	—	—	—
Wyoming	2	4	—	—	1	—
Yale	21	10	1	13	15	13

NUMBER OF COLLEGES

American	142
Foreign	55
Total	197

NUMBER OF GRADUATE STUDENTS

Candidates for Advanced Degrees	208
Pursuing Undergraduate Work	352
Total	560

NEW STUDENTS FROM OTHER COLLEGES BY YEARS, 1921–1922

Class Joined at Institute	Years Spent at College				Total
	One	Two	Three	Four or more	
First year	67	21	4	8	100
Second year	24	47	13	34	118
Third year	9	26	27	52	114
Fourth year	—	—	5	10	15
Graduate year	—	—	6	123	129
Army	—	2	—	37	39
School Public Health	—	1	—	14	15
Total	100	97	55	278	530

COLLEGE STUDENTS AMONG THE COURSES, 1921–1922

Graduates and Students from Colleges, 30% of the Total Student Body	Civil Engineering	Mechanical Engineering	Mining Engineering	Architecture	Chemistry	Electrical Eng., Inc., VI-A	Biology and Public Health	Physics	General Science	General Engineering	Chemical Engineering	Chemical Eng. Practice	Sanitary Engineering	Geology	Naval Architecture	Naval Construction	Electrochemical Eng.	Engineering Administration	Aeronautical Engineering	Mathematics	School of Public Health	Special	Army	Total	Per cent of Student Body
Graduates	30	54	15	24	57	73	5	13	—	7	48	40	1	9	6	31	10	35	10	1	15	40	36	560	15.9
Non-graduates	33	100	17	30	9	105	2	2	2	9	64	4	4	2	12	—	10	93	—	—	1	4	3	506	14.4
Total	63	154	32	54	66	178	7	15	2	16	112	44	5	11	18	31	20	128	10	1	16	44	39	1,066	30.3

AGES OF FIRST YEAR STUDENTS, OCTOBER, 1921

Under 17	14
17 to 17½	55
17½ to 18	65
18 to 18½	135
18½ to 19	84
19 to 19½	98
19½ to 20	48
20 to 20½	55
20½ to 21	20
21 to 22	40
22 to 23	19
23 to 24	13
Total	646

Over twenty-four, 40.

Omitting those under 17, and over 24, on October 1, the average age was 19 years and 2 months.

STATISTICS OF THE SUMMER SESSION

	1921	1922
Total number of students	1,487	1,419
Number of Institute students enrolled	556	1,139
Number not previously connected with the Institute	931	280
Registrations to make up failures or deficiencies	715	791
Registrations to anticipate work	3,700	3,698
Registrations at Summer Surveying Camp	123	92
Summer School students who did not register for the school year following	317	319

Graduates by Years and Courses

Year	Civil Engineering	Mechanical Engineering	Mining Eng. and Metallurgy	Architecture	Chemistry	Electrical Engineering VI and VI-A	Natural History or Biology	Physics	General Course or General Science	General Eng.	Chemical Eng.	Chemical Eng. Practice X-B	Sanitary Eng.	Geology	Naval Arch.	Electrochemical Engineering	Engineering Administration	Total	Total by Decades
1868	6	1	6	—	1	—	—	—	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	1	5	—	2	3	4	—	—	—	—	—	—	—	—	43	
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	226
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	49	63	14	27	12	45	10	1	5	—	43	—	17	2	9‡	10	37	343*	
1918	45	75	10	28	10	50	7	3	4	1	40	—	5	1	4	11	29	321*	
1919	45	65	7	16	8	49	9	4	1	3	44	—	6	—	7	6	28	296*	
1920	52	54	13	19	6	30	2	2	4	1	62	—	2	—	12	9	48	316*	2,941
1921	98	127	24	11	9	74	3	1	—	15	90	—	3	3	18	15	70	560	
1922	58	126	22	29	10	74	8	8	1	18	76	14	7	7	13	24	114	609	
Total	1,505	1,902	615	659	543	1,371	126	83	125	38	751	14	216	27	276	151	326	8,701	

Names counted twice, students graduating in two different years	26
Bachelors of Science	8,675
Masters of Science	643
Master in Architecture	5
Doctors of Philosophy, of Engineering, and of Science	63
Total	9,281*

*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 XIII–B 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
1921	1	3	—	3	—	7
1922	—	4	1	—	—	5
Total	2	27	9	5	6	49

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	Chemistry	Electrical Engineering	Geology	Mining Engineering	Total
1920	1	—	—	1	1	3
1921	—	—	—	—	—	—
1922	1	1	1	—	—	3
Total	2	1	1	1	1	6

MASTER IN ARCHITECTURE

Year		Total
1921		3
1922		2
Total		5

Master of Science	Civil Engineering	Mechanical Engineering	Mining Engineering	Architecture	Chemistry	Electrical Engineering Inc. VI-A	Biology and Pub. Health	Physics	General Science	Chemical Engineering	Chem. Eng. Practice	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	4	5	1	—	2	7	1	1	—	3	—	—	3	—	19	—	1	—	1	4	52
1921	2	10	—	1	6	4	—	—	—	29	—	—	2	—	20	—	—	3	—	17	94
1922	5	4	3	1	4	37	—	1	—	6	32	—	2	—	10	—	1	5	2	18	131
Total	39	45	12	86	45	91	12	8	1	58	32	10	10	3	112	5	5	25	4	40	643

REPORT OF THE MEDICAL DIRECTOR

The Medical Department and that of Physical Training have been merged into one Department of Hygiene, in charge of the Medical Director.

Because of the rapid growth of the Medical Department during the past year it was found necessary to run a double clinic. The morning clinic, from 8.30 to 9.30 daily, is in charge of Dr. Benjamin Sibley, and the afternoon clinic, from 4 to 5 o'clock, is in charge of Dr. Louis Croke.

Number of cases treated in clinic, 17,826.
Number of examinations, 1,181.
Number of men with one or more defects, 213.
Nature of defects: Albumin in urine, high blood pressure, deafness, defective eyes, flat feet, defective heart, infected tonsils, defective lungs, scoliosis, and defective teeth.
Average age, 18. Weight, 140 pounds.
The average eyesight was found poor but in most cases corrected by glasses.

Each man who was found to have a physical defect was advised to remedy it by proper treatment and was referred to the proper authorities. Corrective measures and exercises were advised in regard to posture, etc.

In addition, three lectures were given to the freshmen, on "Personal Hygiene," "First Aid," and "Sex Hygiene," special stress being given to teaching the men how to live and care for themselves.

Every case of illness was reported to the Medical Department, and in this way isolation of infectious and contagious diseases was controlled more efficiently. Isolation of men sneezing or coughing in class during an epidemic of mild influenza probably had some effect in stopping its spread.

In an effort to prevent illnesses or accidents arising from competitive sports all men entering them were examined. The following table shows the result of this examination:

Number of men examined, 1,181.
Passed, 968.
Rejected, 213.
Nature of defects: Albumin in urine, high blood pressure, defective heart, hernia.

No man was absolutely refused permission to enter competitive sports, but in a case of serious defects the written consent of his parents was required.

During the year a total of 1,181 examinations were made. In four cases tuberculosis was found and proper treatment instituted, thus saving the men from reaching a serious or incurable stage.

Contagious diseases were discovered and isolated as follows:

Chickenpox, 2.	Mumps, 13.
Diphtheria, 1.	Scarlet Fever, 8.
Measles, 4.	Tuberculosis, 4.

Meningitis, 1.

As no one disease attacked more than 13 men the isolation method seems to have had the desired effect. In addition to our effort to prevent disease, we have made a definite effort to treat disease and to shorten the period of disability. In addition 46 cases of influenza were isolated as far as possible.

The First Aid Room was open at all hours, with a registered nurse in attendance from 8 A.M. to 5 P.M. The entire personnel of the Medical Department have been extremely conscientious and have not spared themselves in any way to carry out the plans of the Medical Director and to relieve suffering and make patients comfortable.

A synopsis of the work is as follows:

Total number of patients, 17,826.
Total medical cases and respiratory cases, 17,343.
Digestive disturbances, 350.
Total surgical cases, 233.
Nature: Appendicitis, hernia, fractures, styes, wens, warts, etc.
Total number requiring hospital care, approximately, 40.
Nature: Tuberculosis, fractures, burned eyes, contagious diseases, malaria, jaundice, influenza, appendicitis, tonsils and adenoids, etc.

The most common cause of illness was infection of the respiratory tract of which we had 2,561 cases. In this group we include colds, sore throats, bronchitis, influenza, and pneumonia.

One of the chief causes of disability is indigestion owing to the fact that the men eat improper food and eat at irregular hours.

I believe that more men should be encouraged to eat at Walker Memorial, where the food is excellent and where proper diet is given each day.

In every case of serious illness, a telegram was sent at once to the man's parent or guardian, who was kept advised of his condition by daily bulletins. As a result of this, we received many grateful letters from parents.

During the year it was found that a number of students required treatment for which they were unable to pay; fortunately the Medical Department was able to secure a fund with which to help the most pressing cases. It was necessary to call upon this fund ten times during the year.

There were 114 treatments accorded the Instruction staff.

The following table shows comparison of 1920–1921, and 1921–1922.

1920 – 1921

Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June
509	670	549	923	1113	1116	1233	1054	476

1921 – 1922

Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June
1290	1244	1104	1892	2176	1744	1639	1923	784

Each student absent on account of illness was required to report to the Medical Department before returning to work. In several instances, men were found to have let their enthusiasm overrule their good judgment, and were sent home for further convalescence.

To show the great loss of time resulting from illness, I wish to report that there were 3,658 days lost from October to June. If we take the total enrollment as 3,500 and divide the number of days by it, it shows a loss of more than one day per student, or nine hours taken from each student's work.

COMMITTEE ON ADVANCED DEGREES AND FELLOWSHIPS

Although there has been a decrease in the registration this year, this is not due to a falling off in the number of students registered for graduate work, which is the largest on record. The number of students working for higher degrees is now 303 as compared with 242 in 1921 and 163 in 1920. Of these, 243 are applicants for the Master's degree, 39 for the degree of Doctor

of Philosophy, and 21 for the degree of Doctor of Science. The enrollment is largest in the departments of Chemistry, Chemical Engineering, Physics and Electrical Engineering, but practically every department of the Institute is giving graduate instruction at the present time.

The Committee on Advanced Degrees and Fellowships recommended and there were awarded during the past year 116 degrees of Master of Science with specification of department, 18 degrees of Master of Science without specification of department, five degrees of Doctor of Philosophy, and three degrees of Doctor of Science.

With the growth of the graduate school has come an increased demand for graduate scholarship aid, and the Committee on Advanced Degrees and Fellowships has been obliged to reduce the amount of grants made to candidates for the Doctor's degree, and to limit awards in nearly all cases to students who have proved their ability by at least one term of residence at the Institute. The Committee made 45 scholarship awards in 1921–1922. Requests for scholarship aid were received from 81 applicants. The establishment of additional substantial fellowships to aid students in pursuing graduate work, particularly when it extends over two or three years as in the case of the Doctorate, is greatly to be desired.

During the past year eight members of the staff were relieved from a portion of their routine duties in order that they might devote a greater part of their time to research, by grants from the appropriation set aside for this purpose, with the result that there have been published during the year ten papers in Mathematics, one in Physics, one in Electrical Engineering and five additional papers are reported as nearly ready for publication. This method of encouraging research among members of the staff has certainly justified itself by the excellent results obtained.

To further promote research a new "Journal of Mathematics and Physics" has been established during the past year, and four numbers containing nineteen original articles have appeared. The Journal is edited by Professor C. L. E. Moore, with a board of assistant editors consisting of Professors Woods, Keyes and Goodwin. The character of the papers thus far published is

indicative of the high standard which it is expected this Journal will maintain.

During the year 58 reprints of original articles published by members of the staff were submitted to the Committee for binding in Institute covers for distribution among libraries and individuals. Although this does not by any means represent the total list of publications by the staff during the year, it is gratifying evidence of the productive work being carried on in the various departments.

H. M. GOODWIN, *Chairman.*

SUMMER SESSION

The summer session for 1922 was the largest in the history of the Institute. Many of the students took more than one course, making the total registration by subjects 4,568. The instructing staff included 60 professors, 47 instructors and 34 assistants. The session began June 12 and extended to October 11.

The courses offered were divided into five groups. Four of these groups were the same as for last year, namely: Required Courses; Elective Courses, subjects of the regular four-year schedule; Courses in Entrance Subjects; and Courses differing from those of the required schedules, which were offered to teachers or other persons desiring instruction during the summer months. The fifth group consisted of courses for the United States Army and Navy officers as follows: Ordnance Engineering and Differential Equations for 27 ordnance officers, Gas Engine Laboratory for 11 ordnance officers of the Ordnance School at Watertown Arsenal, Mathematics (Aeronautical) for 10 naval officers, and special courses for 4 army officers. The work of these officers at the Institute begins in the summer session and is followed by a schedule for the entire academic year. These special courses occupied nearly the whole part of the summer session.

Summer courses originated at the Institute as undertakings by members of the instructing staff to give review subjects to students who had failed in certain subjects. Summer courses today are an integral part of the work of the Institute. Required courses in the summer have become a part of the schedules of

some of the professional courses as a requirement for a degree, and nearly all of the elective courses are full equivalents of the subjects given during the regular school year. All the departments of the Institute except Mining and Metallurgy gave instruction during the summer session in from three to thirty subjects each.

The character of the summer session, as well as the type of students attending, which showed a change a number of years ago, has changed in a marked degree during the past three years. A large majority of the students are now anticipating their work while those who are repeating subjects or making up deficiencies are in a small minority. The ratio of these two types of students is about five to one, whereas a number of years ago these figures were reversed. There was a good registration of students from colleges and other technological schools.

CHARLES F. PARK, *Director.*

SOCIETY OF ARTS

The past year was the sixth of the series of Popular Experimental Science Lectures which have maintained their interest among the high and preparatory schools of Boston and its vicinity.

As noted in the annual report of last year, the last lecture of that series was repeated because of the great demand for tickets. Following the success of this repetition, it was planned at the beginning of the past season not only to repeat the Friday afternoon lectures on Saturday afternoon for the benefit of the pupils of these schools, but to hold similar lectures on the following Sunday. To these Sunday afternoon lectures, the public was invited; they were not restricted to high-school pupils. In fact, notices of these lectures were printed in the daily press, and the application for tickets during the whole season was greater than the supply of tickets. The demand for tickets for the last lecture, while more than the capacity of the hall would permit, was distinctly less than for the earlier lectures. On this account lecture dates earlier in the season are rather to be chosen for the public than later ones.

During the past season, the lectures have been given by four members of the staff of the Institute. The first lecture, a repetition of an earlier lecture in the series but somewhat amplified, was given by Professor Harry M. Goodwin of the Department of Physics on "Light—Visible and Invisible," illustrated by color and fluorescent phenomena. It was held on Friday, January 20, at 4.00 P.M.; Saturday, January 21, at 2.30 P.M.; and Sunday, January 22, at 4.00 P.M.

The second lecture was given by Professor Earl B. Millard of the Department of Chemistry on "Chemistry, in Particular, Chemistry at Home." This was given on Friday at 4.00 P.M., Saturday at 2.30 P.M., and Sunday at 4.00 P.M., February 10, 11 and 12.

The third lecture, by Professor Frederick S. Dellenbaugh, Jr., of the Department of Electrical Engineering, was given at the same hours of the corresponding days of the week, on March 10, 11, and 12. His lecture was on "Radio Communication."

The last lecture, on "Sounds and Noises," was given by Professor Charles L. Norton, Director of the Division of Industrial Coöperation and Research, and Professor of Industrial Physics, on the corresponding days and hours on April 7, 8, and 9. This lecture was one similar to an earlier lecture given by Professor Norton and proved a splendid climax for the season.

WALTER HUMPHREYS, *Secretary.*

DEPARTMENT OF CIVIL AND SANITARY ENGINEERING

The important change during the year in the work of the Department has been the introduction of certain additional courses in Water Power Engineering in connection with the going into full operation of the new option entitled Hydro-electric Engineering which was discussed in last year's report. This option has attracted a considerable number of students and has had the anticipated result of distributing advantageously the teaching burden of the members of the instructing staff.

Resignations during the year include that of Assistant Professor Howard B. Luther who left at the conclusion of the Summer Camp session to become Professor of Civil Engineering at the University of Cincinnati. Professor Luther was graduated in 1908 and was appointed an Instructor in Civil Engineering in February 1913, having previously spent two years as an Assistant in the Department and two and one-half years of study in Germany as an Institute Fellow. He was promoted to the grade of Assistant Professor in 1919. During his connection with the Department, Professor Luther has taken charge of courses both in Structural Engineering and Hydraulic Engineering, in both of which fields he has shown marked ability. In addition, during recent years, he has served as executive officer at the Summer Surveying Camp. His services won for him the respect and appreciation of students and colleagues, and his resignation is greatly regretted by the members of the Department staff.

Other resignations during the year include those of Merritt P. Smith, Instructor in Highway Engineering; Wesley H. Blank, Instructor in Structural Engineering, and the entire corps of assistants, all of whom left to engage in professional practice.

The position left vacant by Professor Luther's resignation has been filled by the appointment of Walter M. Fife as Assistant Professor of Civil Engineering. Mr. Fife is a graduate of the Civil Engineering course at the University of Alberta, and, in addition, holds the degree of Master of Science in Civil Engineering from the Massachusetts Institute of Technology. He has

had a considerable and varied amount of professional experience, and three years of military experience with the British Army. His teaching experience includes four years as Lecturer at the University of Alberta and one year as Assistant Professor of Civil Engineering at that institution.

Pending the appointment of a member of the permanent staff to carry on the courses in Sanitary Engineering and in Public Water Supplies formerly conducted by Professor Dwight Porter, Mr. George A. Sampson of the firm of Weston & Sampson, Consulting Engineers, Boston, was appointed as Lecturer in these subjects for the year 1921–1922 and carried on these courses with marked success. Owing to professional duties, he is unable to undertake the work during the coming year and these courses will be conducted by Richard H. Gould, S.B., M. I. T., 1911, Principal Assistant Engineer with James H. Fuertes, New York City.

The United States Army Engineer Corps sent during the year nine engineer officers for training in Civil Engineering, including eight majors and one captain. A somewhat smaller quota of such officers is registered for the coming session. These engineer officers are selected from those standing highest in their respective classes at West Point and have had some years of active service before coming to the Institute, including, in several cases, membership on the instructing staff at West Point. Because of their ability, maturity and experience these students exert a valuable influence upon the other students of the Department.

As usual, the members of the staff have engaged in extra-academic work during the year, thereby keeping in touch with professional practice and with the work of engineering and professional societies.

The eleventh session of the Summer Surveying Camp was held during the summer from July 31 to September 22, inclusive. The attendance consisted of 97 students. Eighty-seven of these students were from Courses I, III, Options 1 and 3, IX–B, XI, XII and XV, Option 1, from which attendance is required, the remainder coming from miscellaneous courses at the Institute and from other institutions.

The instructing staff included Professors G. L. Hosmer, J. W. Howard, H. B. Luther, J. B. Babcock, H. L. Bowman, and Messrs.

W. A. Liddell and K. C. Reynolds of the regular instructing force; W. C. Eberhard, Instructor in the Department of Drawing of the Institute, and the following assistants: A. Bresth, S. B.; J. Nolen, Jr., S.B.; W. F. Barrett, S.B.; L. M. Gentleman, S.B,; E. C. Keane, S.B.; K. W. Robbins, S.B.; J. B. Brittain, G. E. Barnes, W. S. LaLonde, Jr., and J. L. Piland. Medical supervision was given by Dr. John A. Carroll during the first two weeks of the session, and by Dr. Thomas J. Connor thereafter.

The cost per student for meals and miscellaneous expenses necessary for the operation of the camp was $1.40 per day as compared with $1.47 per day in 1921. The total charge for these items for the camp session was $74.20 per man.

The class in Underground Surveying was held at a mica mine at Alexandria, N. H., owned and operated by the General Electric Company. Arrangements for the use of this mine were made through the kindness of M. F. Westover, Secretary of the General Electric Company, and G. W. McNaughton, Mining Engineer of that company. The course was given under the general supervision of Professor J. W. Howard, but the work in the field was handled directly by W. C. Eberhard, Instructor in the Department of Drawing, and A. A. Brown, private assistant to Professor Charles E. Locke. This mine was found to be the most satisfactory mine for instruction in Underground Surveying that has been used for this course.

The thanks of the Department are due to the proprietors of Locks and Canals at Lowell for permission to occupy their stream gaging station; to the Holyoke Water Power Company, the New England Power Company and the S. Morgan Smith Company for courtesies extended in connection with the course in Water Power Engineering; and to the Hampden County Commissioners for furnishing a large scale model of the new Hampden County Bridge at Springfield, Mass. Further courtesies have been received in connection with the course in Highway Engineering.

Two valuable surveying instruments were given to the Department by C. L. Berger & Sons of Boston, a firm which has already made valuable contributions to our equipment of surveying instruments.

CHARLES M. SPOFFORD.

DEPARTMENT OF MECHANICAL ENGINEERING

Early in the fall of 1921 the Department changed the schedule of studies given the students in Mechanical Engineering; increasing the time allotted to Applied Mechanics, thereby making it possible to give a more thorough discussion of the Theory of Elasticity; increasing also the time given to Heat Engineering, which now includes heat transmission in addition to the subject matter given in the past.

The extra time given to these subjects was obtained by a reduction in the hours allotted to the design of Industrial Plants.

For a number of years the Department has offered in the second and third terms of the senior year a choice of professional electives. In the new schedule the Department is offering a general course with a choice of two electives which may be selected from a list of sixteen subjects. Ten of these sixteen are given by the staff of the Mechanical Engineering Department, four by the staff of the Chemical Department, one by the Mining Department and one by the staff giving instruction in Aeronautics.

In addition to the general course the Department is offering four options: Option 1, Automotive Engineering, which has been introduced because of the large demand for special training in this line, was presented at this particular time because the Department now has adequate laboratory facilities in the shape of gas engine equipment; Option 2, Engine Design; Option 3, Textile Engineering; and Option 4, Ordnance Engineering.

During the summer of 1921 arrangements were made with the Ordnance Department of the United States Army to take over the instruction in Gasoline Engines given ordnance officers of the United States Army. This work has been given in the past at the Aberdeen Proving Ground. The Government furnished a number of engines of each type used by the Ordnance Department in its tanks, tractors and motor-propelled equipment. The Corporation authorized the construction of a building 45 by 90 which was erected on the site of one of the old barracks buildings. This building has been equipped during the year and at the present time between 2,000 and 2,500 engine horse power are installed. One engine of each type is erected on a test block and arranged for economy test, the engine being connected with either an electric dynamometer or with a water brake. A large

part of the instruction given these officers consists in what are called "Troubles" or why an engine fails to run or does not run properly. The Institute was fortunate in adding to its staff Mr. Dean Fales who has been made an Assistant Professor (working part time) who has been responsible for the installation of the equipment and who now has charge of the instruction given the officers. This laboratory will be available during the winter for special research work and for some undergraduate work. A special class of officers has been sent by the Government to receive instruction in this laboratory during the month of July and another squad of officers is to be detailed for similar instruction in January, 1923.

Twenty-six officers reported on July 5 for the special instruction in the Ordnance School of Application.

During the year the Massachusetts Institute of Technology Post of the Army Ordnance Association was established at Technology. The membership of this organization consists of students of the senior and of the junior classes who are enrolled in the Ordnance Unit of the Reserve Officers Training Corps and of the ordnance officers of the Regular Army who are studying at Technology. This association has secured, through the War Department, the services of a number of officers who have been sent here to lecture on tanks, tractors, bombing, small arms, anti-aircraft guns, etc.

The student section of the American Society of Mechanical Engineers entertained, together with the Boston Section of the American Society of Mechanical Engineers, the student sections from Harvard, Tufts, Northeastern and Worcester Polytechnic. About five hundred were present at the meeting. Following an address by Mr. Kimball, president of the national Society, the guests were taken through the laboratories which were in operation. The Boston Society of Mechanical Engineers provided refreshments.

The training of engineer officers for the United States Shipping Board begun early in the war, was continued o December, 1921. During the last year the course had been open only to those men holding a Federal license of the grade of chief engineer or first assistant engineer who desired to obtain a special license to operate on turbine-driven vessels.

The Mechanical Department graduated during the year its largest class, one hundred fifty-five men, including men receiving the degree of Master of Science.

Assistant Professors L. S. Smith and George W. Swett have been made Associate Professors; Instructor Dean Peabody, Jr. has been raised to the grade of Assistant Professor; Assistants J. K. Pierson and I. N. Zavarine were promoted to the grade of Instructors.

During the year the Department has received as gifts to the Machine Tool Laboratory about thirty-five hundred dollars' worth of miscellaneous equipment as follows:

25 Machinists' Vises. — Charles Parker Co.
24 Machinists' Hammers. — Henry Cheney Hammer Corp.
24 Machinists' Hammers. — Fayette Plumb, Inc.
Hansen Electrocator. — Bely Sales Co.
Assortment of Monkey Wrenches, Pipe Wrenches, Screwdrivers, Chisels, and Hammers. — H. D. Smith & Co.
24 O-No-Drip Oil Cans. — Arthur S. Harding Co.
Set of Hoke Gages, and a complete New Head Spindle with Indexing Parts for Thread Milling Machine. — Pratt & Whitney Co.
Pressure Lubricator Guns. — Carr Fastener Co.
One No. 3 Crowfoot Puller, one No. 3 Combination Arbor Press. — Crane Puller Co.
Dial Gage. — B. C. Ames Co.
16″ Eberhardt's High Duty Shaper, motor-driven. — Gould & Eberhardt.
Lead Test Indicator. — West & Dodge Co.
116 Hammers. — David Maydole Hammer Co.

In addition the Department has received:

Deoleizer. — The Oleite Co.
Baetz Patent Air Heater. — Skinner Brothers Manufacturing Co.
Nash Heating Unit. — The Nash Engineering Co.

EDWARD F. MILLER.

DEPARTMENT OF MINING, METALLURGY AND GEOLOGY

In my last report I mentioned the consolidation of the Department of Mining and Metallurgy with that of Geology. During the year 1921–22 this consolidation was in effect and the several sections have continued their close coöperation. As to administration this plan has worked very well, but there is a doubt in my mind whether it should be continued indefinitely. Naturally, mining and metallurgy are very closely associated, but geology and mineralogy occupy a somewhat different position inas-

much as that section serves a considerable number of other courses. I am inclined to believe that the development of the various sections would be best served by re-establishing the Department of Geology as a separate unit.

During the year the students in the Department numbered one hundred and thirty-six, of which 32 were in Course XII and 104 in Course III. The following table shows the distribution of students for 1921–22:

DISTRIBUTION OF STUDENTS 1921–22

	III_1	III_2	III_3	XII
Second Year	22	8	—	—
Third Year	24	12	—	5
Fourth Year	11	14	5	11
Undergraduate Sp.	1	—	—	4
Graduate Candidate S.M.	1	4	—	2
Graduate Candidate Ph.D.	—	—	—	3
Graduate Sp.	2	—	—	7
	61	38	5	32

In discussing the above table it must be borne in mind that certain changes were in effect in the schedules since last year. Option 3, Course III has been eliminated leaving only a mining and a metallurgical schedule, referred to respectively as Option 1 and 2. The number of students in III_1 shows a tendency to increase, the third-year men numbering twenty-four. During the second year the separation between the various options is usually not sharp because some men fail to make up their mind until they come to their third year. In Course III_2 the number stands at about an even dozen, but it is believed that the tendency is towards a greater number of men coming into this option.

Referring to Course XII, it is apparent that the number of students tends to increase. It is not often that many students for this course are recorded in the second year for the same reason as that given above, namely, that few students can make up their mind about the selection until they have arrived at their third year.

In the graduate department few students are noted in Course III_1, while more, perhaps four or five, are registered in Option 2. In Course XII the graduate students almost equal in number the undergraduates. The table shows that during the year twelve such students were working in Geology.

During the year there were no important changes in the instructing staff. Mr. M. E. Hurst and Mr. C. J. Muller were serving as half-time instructors, and during the last term Mr. P. C. Benedict was added as a part-time assistant. Mr. E. C. Layng was appointed as temporary assistant in Mining.

At the end of the third term Professor Charles H. Warren resigned from his post as Professor of Mineralogy, and his place will be very difficult to fill.

At the same time two important additions were made to the staff of the Department when the Executive Committee of the Institute appointed Mr. W. Spencer Hutchinson of Boston as Professor of Mining, and Mr. G. B. Waterhouse, formerly of the Lackawanna Steel Company, as Professor of Metallurgy. These two men will enter on their academic duties during the coming year 1922–23.

During the third term, Mr. J. O. Lewis, formerly Chief Petroleum Technologist of the Bureau of Mines, of Marietta, Ohio, gave a series of well attended lectures on petroleum production. During the same term, Professor Chevalier of Tours, France, presented a series of lectures on alloys. These lectures given in French were remarkably well attended and much appreciated.

The changes in the courses of instruction referred to in my previous report were in partial effect during this year. The fourth-year men were still working on the old schedule, but the new course was in operation for the second and third-year men.

It was expected that owing to the depressed condition of the industry considerable difficulty would be experienced in securing places for the men who graduated in this Department in the spring of 1922. Fortunately this proved groundless, and most of the men were placed in technical positions without much delay.

During the year it was decided by the Faculty to establish a separate Summer School for ordinary Surveying and Mine Surveying for the miners and geologists at some place which would offer better opportunities than the present Technology Camp in Maine. The vicinity of Dover, N. J., was selected and steps are now being taken to get this new camp in operation for next summer.

The time for the students in this Department was, also, transferred to the summer between their third and fourth years

instead of between the second and third years as before. It developed, however, that some students had deferred their Summer School for various reasons so that nine or ten miners were cared for during the present summer at the Alexandria Mica Mine, N. H., where they received instruction in Mine Surveying.

Additions to the equipment of the Section of Mining and Metallurgy include Cottrell electro-precipitating apparatus for fume, full-sized zinc retort muffle, Hummer vibrating screen, and Flint mine signaling apparatus.

In the Geological Section two new microscopes have been purchased for petrographic instruction.

Continual and large additions have been made to the collections. Many of these additions come from graduate students who often send in valuable specimens and special collections. A large collection of living shells has been donated to the Department through the kindness of Mr. George A. Hough, of New Bedford, as well as the case to hold it.

The Mining and Metallurgical Library is still separate from that of the Geological Section, and it has not been found possible so far to consolidate them. The accessions to the Mining Library numbered 212, and the circulation was 1,530; the accessions to the Geological Library numbered 37, and the circulation was 1,160.

During the summer of 1922 Professor Lindgren carried out an examination of the ore deposits in the Jerome and Bradshaw quadrangles, Arizona, for the United States Geological Survey.

During the same summer, Professor Locke examined certain mines and mills in North Carolina and Chihuahua, Mexico.

Professor Hayward undertook with the kind coöperation of the Division of Industrial Coöperation and Research a round trip to most of the important non-ferrous smelting works in the Western States.

WALDEMAR LINDGREN.

DEPARTMENT OF ARCHITECTURE

The significant event in the year 1921–1922 for the Department of Architecture was the coming, shortly after the opening of the second term, of Professor Albert Ferran. Trained thoroughly

in the principles of the Ecole des Beaux Arts, winner of its Grand Prix de Rome, tried by the long years of the war, and further tested during a year's residence at the Villa Medici in Rome, he brings to the Department a knowledge and enthusiasm that have long been needed and that are correspondingly highly appreciated.

The approval by the Faculty toward the end of the third term of the proposed changes in the schedule of Option 1, and certain modifications in Option 2, should mark another step toward the better fulfillment by the Department of its responsibilities. These changes, which will not be fully operative for another two years, while they stamp more definitely the different purposes served by the two options, at the same time enable each option the better to use the all too brief periods at its disposal to the fullest advantage and with the least waste of time.

It is believed that a further step in the same general direction should be taken in the first year by classifying the mechanical and architectural drawing time as an elementary course in design.

In further reference to the new special student scholarships mentioned in last year's report, the excellence of the work performed by last year's holders, and the fine type of men selected this year, lead the Department to urge that action by the Institute in this direction could be taken advantageously.

Six students followed the fifth-year course and were an excellent influence for the undergraduates both as example and performance. An increasing number of students in this grade is to be hoped for, and the scholarships made available are highly appreciated.

In this connection it is interesting to note that of the 115 students enrolled in the Department last year, exclusive of the freshmen, 60 per cent had pursued from one to four years of college studies before entering. Inevitably, the class of 1922 — energetic, capable, marked by a fine esprit de corps and also by unusual numbers—will be missed, and it is still problematical at this writing whether their place as a mere matter of numbers can be taken by the new comers.

No comment on the past year would be complete without a word as to the working student council and the honor system in the Department. Both are evidences of administrative approval of such procedure where conditions and student public opinion

appear to justify it. It can be said in all fairness to the students that they have fulfilled their obligations conscientiously and with dignity.

Earlier efforts toward effective coöperation with the Harvard School of Architecture in matters of design have been extended with unquestioned advantage to both teachers and students, and the prospect is good of an even fuller measure for the coming years.

Landscape Design, Town Planning, and Architectural Humanities, given in the successive terms of the year, form a group of studies primarily for graduate students, that appears to meet a growing demand in the profession and brings the advanced students in contact with men of thorough training in these new fields.

Exhibitions continue to be an effective way of introducing the students to subjects of interest outside the immediate field of their studies, and many were held in the course of the year.

At last the Department has succeeded in housing in a fitting manner the purchases made from the Frank Walter Boles Memorial Fund. Designs prepared by Professor H. W. Gardner and Mr. F. J. Robinson have been executed in one of the rooms of the library so as to give ample space for the use and storage of the books and plates that this fund has placed at our disposal. The carrying out of this work was made possible by a generous gift from Mrs. Harriet A. Henshaw, a sister of Mr. Boles, and by other moneys from friends of the Department.

Following is the list of prize winners for the year:

The 1922 Traveling Fellowship in Architecture, J. J. Stanton.
Chamberlain Prize, W. T. Vahlberg.
Rotch Prize for regular student, R. Hayward.
Rotch Prize for special student, J. J. Stanton.
Boston Society of Architects' Prize for regular student, R. Hayward.
Boston Society of Architects' Prize for special student, E. T. Heitschmidt.
F. W. Chandler Prize, Grade III, Nos. 3 and 4, R. Hayward.
F. W. Chandler Prize, Grade II, No. 5, L. H. Skidmore.
Class of 1904 Prize, regular student, J. E. Berla.
Class of 1904 Prize, special student, C. H. Lovell.
Special Prize for Water Colors, Miss Marjorie Pierce.
Special Freehand Drawing Prize, G. R. Wiren.
Triglyph Fraternity Prize, F. W. Westman.

The following gifts have been made to the Department: seven hundred photographs, copies of "Descriptive Geometry" and "The Life of Daniel H. Burnham," and Professor William H. Ware's sketch-book and memorabilia.

I append herewith Professor W. H. Lawrence's report on the Division of Drawing.

WILLIAM EMERSON.

DIVISION OF DRAWING

The Division of Drawing has little to report except progress in the improvement of the courses offered and in methods of instruction along the lines already adopted.

A new set of data for the study-sheets illustrating the fundamental problems in Descriptive Geometry is being designed, and the sheets for the first term will be ready for the beginning of the coming year. It is the aim eventually to prepare a number of alternate sets of these data sheets which, supplemented by numerous illustrations and applications for individual solution, will allow much more flexibility in presenting the subject than has heretofore been possible.

The course in Stereotomy, formerly given in the second term of the second year to the students in Civil Engineering, has been discontinued, essential portions of this subject being incorporated into the work of the first term.

There have been no changes in the personnel of the instructing staff. An exchange of instructors with the Mechanical Engineering Department will be continued the coming year with some modifications imposed by the tabular view. Although hardly an extension of the exchange idea, it was found possible for Professor Bradley to assist the Department of Mathematics last year in connection with a part of the course in Mathematical Laboratory relating to the construction of graphical charts.

A request has come to the Division from Professor Emerson that the courses in first-year drawing for the students in Architecture be given at the Rogers Building. While the Division of Drawing is in sympathy with the request, the complex nature of the tabular view and the heavy burden already carried by each instructor have made it possible to grant the request only so far as the courses in Freehand Drawing are concerned. It is hoped that means can be found in the near future to meet the recommendation of Professor Emerson. The courses in Freehand Drawing and Elementary Architectural Drawing, while thoroughly fundamental, have gradually assumed a special character in their

presentation and require for their instruction a man trained in architectural work. These courses have been developed and carried on successfully during the past two years largely through the efforts of Mr. Remington. It is hoped that it may be found possible to release the instructor in charge from all the first-year drawing except that given to the architects, and have him devote the rest of his time to other work in the Architectural Department. The architectural courses might then all be given at Rogers.

This arrangement would require the addition of one instructor to the staff of the Division of Drawing, an addition much needed as our present staff is loaded to the limit of effectual and inspiring instruction, with no factor of safety to meet possible emergencies.

The equipment of the Division is being improved and increased as rapidly as our modest appropriation will permit, and next year each room will be supplied with a full set of models used in the instruction.

WILLIAM H. LAWRENCE.

DEPARTMENT OF CHEMISTRY

The instructional equipment for undergraduate work has again been fully occupied during the past year. The demand for space for the three upper classes seems likely to be slightly less in the immediate future, but the laboratory space for the first-year class is still not as great as is to be desired for efficient service. It is, however, the graduate work for which increased accommodations have been most imperatively required, and some much needed relief will be provided for the immediate future through an exchange of space with the Department of Chemical Engineering, and at the same time the work of the two Departments will be redistributed to mutual advantage. This projected allocation of space lends itself readily to the logical extension of the Departments when new buildings are erected.

The very rapid growth in the number of students taking work in the different phases of Metallography has made necessary some further extension of the space allotted to this branch of the Department. This has been made possible by the interested coöperation of the Department of Mechanical Engineering.

The gratifying influx of students into graduate courses and

the interest in advanced work, noted in the last Report, have continued and will play an increasingly important part in the service to chemical science which the Department will render. Professor Davis has continued his researches for the Ordnance Department of the United States Government, and it is a pleasure to note that the Government has renewed its contract with the Institute for the maintenance of this work, in recognition of the important contributions already made by Doctor Davis and his co-laborers. Professor Schumb was relieved of his instructional duties during one term that he might devote himself to research, this having been made possible by a grant from the research funds of the Institute.

Dr. Earl B. Millard has been promoted from Assistant Professor to Associate Professor of Theoretical Chemistry and has been made Assistant to the Director of the Division of Industrial Coöperation and Research. Doctor Millard's successful teaching and his contributions to the development of the Department and that of the Division amply justify this recognition.

Professors Henry Fay and Frederick R. Kneeland have each been granted leave of absence for a year, the former on account of ill-health, the latter for personal reasons. Professor Williams will take charge of the instructional work in Analytical Chemistry and in Metallography during Doctor Fay's absence. Professor Kneeland's work will be distributed among several members of the staff. The total number giving instruction in chemical subjects during the past year was fifty-three.

The du Pont Fellowship was renewed for the present year and has been held by Clifford Banta, M.A. Miss Helen Gill has been appointed as Research Assistant for the coming year under a grant from the Ellen H. Richards Research Fund. She will work under the direction of Professor H. M. Smith.

It is a matter of much gratification to be able to pay a deserved tribute to the spirit of scholarly and scientific productivity which has steadily grown throughout the Department staff during the recent years. This has necessarily been mainly stimulated and fostered by some of the older members of the staff but the Department as a whole has responded to this stimulus and the yearly output of books and published investigations is a legitimate occasion for satisfaction. This spirit must be augmented and must

constitute, as it now does, the mainspring of departmental inspiration and progress. At the same time due consideration must be given to the fact that the segregation of the Department of Chemical Engineering may easily tend toward the isolation of the Department of Chemistry from vital contacts with the industries of the country. The Department, to be of greatest service, must educate and train its students for industrial service, as well as teaching and research, and its students must be led to understand that the industries are calling for men of the highest ability, who are first and foremost chemists, embued with a love for and knowledge of that science.

The participation of Professor Talbot in administrative offices of the Institute during the past year has again been made possible through the kindly coöperation and forbearance of the staff of the Department. Upon Professor Norris has fallen nearly all of the executive charge of the Department, which he has carried at personal and professional sacrifice and for which he is deserving of much gratitude.

H. P. TALBOT.

RESEARCH LABORATORY OF PHYSICAL CHEMISTRY

Investigations are in active progress covering a considerable portion of the broad field of physico-chemical research. The graduate student, during the period of residence for the degree of Doctor of Philosophy, is afforded the opportunity of acquiring not only a creditable technique in the art of experimentation, but also a sound and detailed grounding in the fundamental theoretical structure pertaining to physical chemistry. One important objective envisaged by the laboratory staff is the development of courses which expound the theoretical structure and its experimental basis in a critical and fundamental manner, assisting the student to develop independence of judgment rather than facility in mere memorizing of theory. The staff feels that some progress is being made in the direction of perfecting such courses and sustained effort and observation can alone lead to final success.

The experimental work is now comprised of three subdivisions under the direction of Professors MacInnes, Gillespie and Keyes assisted by the Research Associates as follows:

Professor Gillespie.	Equilibria in diphase systems, Gaseous Equilibria, Heats of Reaction in Solution, Solution of Hydrogen in metals.
Professor Keyes.	Kinetic Theory Studies, Low Temperature Investigations, Temperature Scale and Heat Capacity Measurements bearing on the Theory of Quanta.
Professor MacInnes.	Ionic Theory, Electromotive Force, The Intensity of X-Ray Reflection from Crystals, Equilibria in Solution.

The progress of the more difficult investigations has been slow in some instances, but it has, however, been continuous. Doctor Hainsworth, working with Professor MacInnes, has succeeded in the problem of measuring the potential to the hydrogen-calomel cell to a somewhat greater pressure than 400 atmosphere, the results of which have been published. Recently, the measurements have been extended to about 1,000 atmosphere. Further work is being planned on chemical equilibria involving hydrogen at high pressures as a means of determining the free energies of certain chemical reactions. The study of X-Ray intensities has progressed to the point where important conclusions can be drawn regarding certain aspects of crystal structure. Dr. Charles E. Ruby has nearly completed an extensive study of the conductivities of binary mixtures of strong electrolytes and of the activities of the ions in such mixtures.

During the summer, Professor MacInnes attended the Conference of Chemists in Utrecht, Holland, and visited the more noted European laboratories, observing the research equipment and methods.

Professor Gillespie, assisted by Messrs. Mitsukuri and Lambert, has brought the continuous flow calorimeter for measuring heats of reactions in solution to the point where reproducible and accurate values are readily obtainable. A paper has been published dealing with the heat of neutralization of sodium hydroxide by means of hydrochloric acid, and considerable additional experimental material has been accumulated. The study of the nitrogen-hydrogen-ammonia equilibrium under high pressures has been much hindered due to the technical difficulties in perfecting a silver bomb capable of withstanding extremes of temperature and pressure over long periods of time. A successful method of construction has been finally arrived at after a considerable expenditure of time and materials.

Doctor Beattie, National Research Fellow, perfected his

apparatus for purifying the rare gases Helium, Neon, Argon and Krypton preparatory to making extensive pressure-volume-temperature measurements, from which the constants of the equation of state can be obtained for comparison with the constants already obtained for substances whose molecules are diatomic and polyatomic. A considerable advance was also made in the perfection of the apparatus for measuring isometrics directly and data for ether taken. The latter data are needed for the further interpretation of the experimental data pertaining to the liquid phase of ether. Doctor Beattie will spend the ensuing year in the laboratory of Professor Onnes in Leiden, Holland, extending the work leading to the establishing of the low temperature thermometer scale. Doctor Beattie took with him a considerable quantity of special apparatus required for his investigation.

The Bureau of Mines investigations have resulted in three papers, aggregating 120 pages. The results of these investigations provide the Bureau with data to be used in perfecting the design of the helium extraction apparatus. A generous allotment of funds has been made by the Bureau of Mines to assist in continuing the work, and more rapid progress is expected as a consequence of the perfection of the experimental facilities. A torpedo research for the Navy will also be continued.

The instrument shop has had added a new universal miller, with complete equipment, a back geared drill and new tool grinder besides numerous small tool equipment. The general facilities of the laboratory have been also much extended, bringing the laboratory as a whole to a very satisfactory state as regards material equipment for the various investigations which are being carried on.

FREDERICK G. KEYES.

DEPARTMENT OF ELECTRICAL ENGINEERING

The Department has had the usual changes amongst the younger staff, by which young men who have been assistants or instructors for a year or two have gone into industrial work under favorable terms and other young men who have just gradu

ated or have had a little experience with industrial concerns have come into our staff. We try to keep the staff of the Department about half of men who received their original engineering training here and about half who have received their engineering training elsewhere.

The promotions in the Faculty rank during the past year were: Professor R. R. Lawrence from Associate Professor to Professor; Professor W. V. Lyon from Assistant Professor to Associate Professor; Professor R. G. Hudson from Assistant Professor to Associate Professor. It is earnestly hoped that certain other promotions may be made next year, and also certain increases of salaries of men in Faculty grade, besides the usual increases or promotions in the lower grades.

Professor Dillon of this Department has been made Director of the Summer Session and therefore will be on duty throughout the Summer Session in an executive and teaching capacity. In order that he may have a vacation of one term we are trying to arrange for his absence during the winter term without interference with the continuity of our subjects.

Professor Kennelly returned to his duties this autumn after having spent a notably successful year in lecturing at the engineering schools of France as the American Exchange Professor under the arrangements supported by seven educational institutions of this country, of which the Institute is one, with a committee of management in which I represent the Institute. Professor Kennelly's visit to France was received with enthusiasm by the French authorities, and many honors were conferred on him, including the degree of Doctor of Science by the ancient university of Toulouse, and the order of the Chevalier of the Legion of Honor by the French Government. The French Ministry of Education and various important schools of France have expressed great satisfaction in this Exchange Professorship arrangement in which the Institute has taken a leading part.

The French Exchange Professor who came to the seven universities in the last academic year was Professor J. Cavalier, Rector of the University of Toulouse. It is my understanding that the French Government has never before designated a full Rector of a university as an exchange professor. Professor Cavalier is a distinguished metallurgist, especially of non-ferrous

metals. His visit to Cambridge was jointly with Harvard and Technology, covering a term of ten weeks co-terminus with our third term. We therefore were able to arrange for him to give two lectures a week upon his specialty, in his native language, which were attended by over one hundred students, mostly from the Mining and Metallurgical Courses, who wished to have special information on metallurgy. These lectures were made a part of our curriculum and were credited as a General Study.

Professor Cavalier prepared in advance a syllabus for the lectures of each week which Mr. Bibber, Instructor in this Department, translated into English and had mimeographed so that the students had a syllabus in English preparatory to each lecture.

The French Exchange Professor designated this year is Professor de Margerie, Directeur of the Geological Service of Alsace and Lorraine. His specialty is Applied Geology, especially as applied to Topography. Professor de Margerie will not come to the Institute until the latter part of the academic year, when we anticipate that his mastery of the subject will be serviceable in our curriculum and to our students.

The number of students in Course VI has continued to grow so steadily that the Administrative Committee authorized measures for control of the promotion from the first year to the second year so that no men will come into Course VI or Course VI–A in the second year except those with a complete record in their entrance and first-year subjects, except as the regulation may be waived for individuals by the head of the Department. This exception is established, as I understand it, particularly for the benefit of mature students who have made a rather notable record in their freshman year but may be behind in some of the preparatory subjects, and yet who give promise of deriving great advantage from their studies.

The steadily increasing number of students has resulted in our undergraduate electrical engineering laboratories being now filled to their full anticipated capacity and some over, but we are still able to cope with the situation. The rapidly increasing number of graduate students has resulted in our having fully occupied all space originally assigned to research laboratories, or which is practicable to assign to this purpose. Last year we turned one half of our Department reading room into research laboratories

and this year have taken the remaining part for a laboratory for the scientific instruction and investigation in problems of electrical communication. Consequently our students must now use the main library for their reading room and study room, or else use such places as are available in Walker Memorial or their residences.

The Vail Library has now been consolidated with the Institute's collection of books in electrical engineering, the book plates of the Vail Library or the Institute Library being placed in the books purchased by the respective funds. This makes the aggregate of the electrical engineering library one of the finest in the world. It has an admirable situation in a segment of the stacks in the Institute Library, and is under the special direction of an assistant librarian whose salary is paid out of the Vail Library Fund. This assistant librarian has the duty of making the electrical engineering library of the greatest service practicable as an educational instrument, and she is constantly advising students in the manner of using books and aiding them in making up bibliographies relating to their studies.

The first class in our Coöperative Course, VI–A, has now completed the work and received the degree of Master of Science. The experience with this course has been thoroughly satisfactory to the teachers in this Department, and the work has received the support of the Faculty of the Institute and the officers and employees of the General Electric Company.

In addition to that we have two offshoots from VI–A with limited numbers of students, one with the Edison Electric Illuminating Company of Boston, and the other with the Boston Elevated Railway Company, the latter just having been established. We believe that these also will prove equally as satisfactory as an educational process as the arrangement with the General Electric Company has proved itself to be.

For a long time many of our students have gone into the electrical communication industries represented by the great telephone and telegraph companies, and we have maintained important graduate work and research along these lines. It seemed desirable for us formally to recognize this tendency by arranging an option which begins in the junior year with scientific study of transmission of intelligence over wires and by radio

means, these subjects being substituted in place of certain other subjects in the curriculum. The proposed option was approved by the Faculty during the preceding academic year and it is now established under the direction of Doctor Kennelly aided by a number of members of the staff and particularly by Mr. Bowles and Mr. Tucker. Mr. Tucker continues to be in charge of the Dynamo Laboratory, and I hope we shall be able to keep him with the latter as his most important duty.

The Coast Artillery and other corps of the United States Army continue to send officers to this Department to study, in addition to the large number of ordnance corps and engineer officers who are assigned to other departments. Of course this Department continues to give instruction in electrical subjects to these other officers and to students of other courses besides the Electrical Engineering courses.

The researches of the Department are going on satisfactorily. ome study of the characteristics of insulation have brought forth additional knowledge regarding the characteristics of the electrical resistance of glass. We now have gone into a considerable research supported by the National Electric Light Association on paper insulation used in high tension cables, which research is carried on under the direction of Professor Bush and others with a research assistant supported by the Association.

Our transmission researches, using our artificial lines and the transmission span on the back campus as a basis, have continued with great interest and some additions to knowledge of the subject. Associated with these researches we made some corresponding tests of a 110,000 volt tie line which was recently built to join two large power transmission systems of the South, the results of which are still under analysis and which we hope may give us some important knowledge regarding obscure phenomena.

The transformer harmonic research which we have had on hand for several years is apparently bearing some fruit and it has resulted in a request from the Joint Committee of the National Electric Light Association and the American Telephone and Telegraph Company, on inductive interference between power transmission and electrical communication lines, to have Professor Dellenbaugh become an official member of that committee.

Other researches are going on and are being developed. We have received hearty interest and coöperation from the Division of Industrial Coöperation and Research in these various branches of work.

The staff of the Department continues to do its share in the professional societies and the important committee work relating to engineering education and scientific affairs. This is burdensome on the individuals and occupies some time which otherwise would be available at the Institute but it seems to be bearing fruit in the more important light we can bring to our problems of education at the Institute, as well as in the reputation as an important factor in the field of engineering education and the advancement of science relating to electrical engineering which the Institute derives from it, and it appears well worth while.

DUGALD C. JACKSON.

DEPARTMENT OF BIOLOGY AND PUBLIC HEALTH

During the year the Department has progressed along the line indicated in last year's report. The changes in the curriculum, which were suggested at that time, have been put into effect with the result that the new option in Fisheries Engineering is now established and offers promise of extension and usefulness in the whole field of food engineering. Much interest has been expressed in it by food manufacturers and we have the promise that with the improvement of business conditions financial support will be given to this work by the industries concerned. The United States Bureau of Fisheries continues to maintain an investigator here working under the direction of Professor Prescott and has further offered to supply to us models of equipment and other material for use in instruction, as well as to detail experts in the different branches of scientific work of the Bureau to assist in instruction.

In the field of public health the Department work has also been extended in a gratifying manner. For many years special students have come to us for advanced work in public health, as

the Institute was the first technical school to offer opportunities in this field. This led to a plan for effective coöperation which has been maintained for several years between this Department and certain departments of Harvard University under the name of the Harvard-Technology School of Public Health. The Certificate in Public Health was issued jointly by these schools to students completing the prescribed course. With the establishment of the new Harvard School of Public Health, under the gift from the Rockefeller Foundation, changes in organization were made necessary, and by vote of the Corporation, the Institute is now authorized to give the Certificate in Public Health to candidates who complete the course of studies approved by this Department. Coöperation of an effective character has been arranged with the Harvard School of Public Health whereby the students in either school may take certain courses offered by the other and receive credit for the same. Several students are already registered for this work during the coming year.

Another phase of public-health training worthy of mention is the special course in Health Education which has been developed largely by Professor Turner for the training of teachers. By coöperative arrangements with the Harvard Graduate School of Education, students taking this course of study are permitted to attend lectures in that school on the Theory of Education. Arrangements have also been made by which the students have opportunity for practical teaching and observation in the public schools of nearby cities. This special course in Health Education has received the approval of the State Department of Education which stands ready to issue a special certificate of proficiency to those satisfactorily completing the course outlined by the Department here. As evidence of the desirability of this type of training, there will be in attendance during the coming year a number of young women from Belgium who have been sent to this country for training by the Commission for Relief in Belgium. Fifteen women have thus far been sent, of whom five are to come to the Institute and ten to take the training at Columbia University.

No changes in personnel have been made during the year. Doctor Bigelow has received merited advance to a full professorship in Zoölogy and Parasitology. During the coming year a

new course in Applied Ichthyology will be given by Doctor Bigelow to students in Fisheries Engineering.

The work of Professor Turner has already been mentioned.

Doctor Bunker has developed the course in Personal Hygiene, Biochemistry and Nutrition along new and effective lines and we hope soon to have research work of high character conducted in these fields.

Doctor Horwood has, during the summer, made an extensive survey of Philadelphia with reference to the prevalence of tuberculosis. Doctor Horwood is a recognized expert in this form of investigation and his services are frequently in demand by cities and states in the development of their public-health programmes.

Two new general studies have been offered by the Department. These general studies, dealing with problems of biology, heredity and general health, are chosen by large numbers of men and indicate an increasing and sane interest on the part of the students in matters pertaining to personal and industrial welfare.

Professor Prescott is continuing to supervise the research upon coffee undertaken in connection with the Division of Industrial Coöperation and Research. During the year a report on "Molds in the Bakery" has been published, this being the result of investigations conducted in the laboratory by two of the senior students working under Professor Prescott, and done for the American Institute of Baking. The report has been received by the industry with very great interest and has been published in full by "Baking Technology," the official periodical of the Institute of Baking.

The Glass Container Association of America for the second time offered a series of prizes to students in the American colleges and technical schools for the best theses dealing with subjects pertaining to food preservation. The theses for both bachelor's and master's degrees may be submitted in this competition. In 1921 the first prize was awarded to two of our students and in 1922 the second, fourth and fifth prizes were awarded to graduates of this Department.

A new departmental bulletin has been issued during the summer, descriptive of the courses and opportunities for graduates of the Department.

SAMUEL C. PRESCOTT.

DEPARTMENT OF PHYSICS

Including Electrochemical Engineering and Aeronautical Engineering

Charles R. Cross, for many years Thayer Professor of Physics and head of the Department, and since 1917, Professor Emeritus, died suddenly in November, 1921. His long and faithful service to Technology has left its lasting imprint upon the Department and its traditions. He carried the Department through the trying days of its early development to a condition of great strength and breadth of instruction. He was the pioneer in instruction in Electrical Engineering and won recognition everywhere as a great teacher and scientist. His death takes one more from the small group of men who carried the burden of teaching and maintained its high standards through the days of small enrollment and of later rapid growth.

The Department has also suffered during the year through the resignation of its head, Professor Edwin Bidwell Wilson, a very great loss. His connection with the Department as its head since 1917, as well as his earlier connections with its students when he was a member of the Department of Mathematics, has been of inestimable value. He leaves us to join the staff of Harvard University as Professor of Vital Statistics, and his going is a matter of grave concern to the Department and of personal regret to all its members.

The seven and one-half foot wind tunnel is nearing completion, and the constantly increasing number of students in the courses in Aeronautical Engineering subjects, as well as the progress of the art itself, renders the necessity of support for the constant development of that portion of our work imperative.

The Department has had added to its equipment a Mendenhall half-second pendulum, suitable for geodetic measurements and also for the training of students in Physics in some simple geodetic measurements.

The liquid air equipment is to be transferred from the Department laboratory to a new and especially equipped building erected to house all the high-pressure air and gas apparatus.

Some relief from the crowded conditions in the general Physics Laboratories has been secured by equipping two large rooms in the basements of Building 2.

The research work in Photo-Elasticity has progressed rapidly during the year with the coöperation of the General Electric Company, which has loaned us a portion of the equipment.

The Laboratory of Industrial Physics has received by gift a large number of heating appliances for the industrial use of coal and water gas for heating. In this laboratory a number of investigations have been carried on in behalf of contractors under the Technology Plan and the results appear to have justified the creation of this subdivision of our laboratory.

C. L. NORTON.

DEPARTMENT OF CHEMICAL ENGINEERING

Including the School of Chemical Engineering Practice and the Research Laboratory of Applied Chemistry

At the suggestion of the Visiting Committee of the Corporation the Department during the year introduced special instruction designed to develop the capacity of the student for oral presentation of technical subjects, especially from a non-technical point of view. Small sections devoted entirely to this work were organized in the third-year instruction in Industrial Chemistry. In the fourth-year course in Thesis Reports and Memoirs special instruction of this type was given in coöperation with the English Department. This work requires attention to the special needs of the individual student and hence puts a distinct burden upon the staff but the Department recognizes its importance and is convinced that the added effort is well worth while.

To meet the needs of those industries in which Colloid Chemistry plays a controlling part the Department organized and introduced two post-graduate courses in Applied Colloid Chemistry and has paid special attention to this field in thesis and research work.

An arrangement has been made with the Department of Chemistry by which space in Building No. 10 formerly occupied by the Research Laboratory of Applied Chemistry was exchanged for laboratory space in the basement of Building No. 2 immediately contiguous to this Department. While this exchange has resulted in no increase in room the convenience of centralization has greatly increased the efficiency of our work.

Assistant Professor W. H. McAdams has received merited promotion to an Associate Professorship in Chemical Engineering.

At the end of the year the Department suffered the loss of Associate Professor R. E. Wilson and Assistant Professor C. S. Venable, both of whom resigned to accept positions of great responsibility in the Research Laboratories of industrial concerns.

Last year's report pointed out the efficiency of the new method of engineering instruction embodied in the School of Chemical Engineering Practice. The developments of this year in that school have emphasized the effectiveness of this type of coöperation with industry as a method of industrial research. In the past large scale experimentation on industrial problems has usually been done in special plants or stations constructed for the purpose. These are expensive to build and to operate. The work of the Practice School is demonstrating that in many cases engineering experimentation of this sort can be carried out to excellent advantage in industrial plants. This avoids the investment necessary for large scale experimental equipment and the existence of the operating organization in the plant usually makes it possible to reduce the expense of the experimental work itself. While a given plant may not possess the equipment required for a specific investigation an organization such as the Practice School, in contact with a large number of plants of diverse type, is normally able to locate equipment of the character required. While such a method of experimentation is not universally applicable in engineering work, we feel that its development furnishes a valuable tool for engineering research.

W. K. Lewis.

THE SCHOOL OF CHEMICAL ENGINEERING PRACTICE

Progress in the School of Chemical Engineering Practice during the past year has been in the direction of improvement in educational methods in order to utilize most effectively the time spent by the student in the plant and to develop, to a greater extent, the scientific and physical initiative of the student. As a result of our experiments the time devoted to "*group* tests" has been reduced, permitting an expansion in the scope and number of *individual* plant investigations or "research problems." Also many oral presentations have been substituted for written reports.

Progress has been made in more closely correlating the work in the Practice School with that given in the undergraduate Chemical Engineering course at the Institute.

The outstanding expansion during the past year was the inauguration of Course X–B, thus making the School of Chemical Engineering Practice available to a larger number of men, particularly undergraduates having ability to profit by such advanced chemical engineering training but to whom the financial burden of another year is too great. Consequently the School of Chemical Engineering Practice now operates practically the entire year: one group of students (Course X–A) attending from July 1 to January 1, and the other group (Course X–B) from January 1 to June 1. While the School of Chemical Engineering Practice was continued during the period from January to June for men in undergraduate course X–B there is already evidence that a large percentage of the students in this section will be Master's degree candidates.

During the past year the Club House at Buffalo has been continued and an additional Club House has been put into operation at Winchester for the benefit of the men working at the Boston Station. This particular location was chosen so as to make the Club accessible to both plants at this station, the Merrimac Chemical Company at South Wilmington and the Revere Sugar Refinery at Charlestown. These Club Houses are a great help inasmuch as they stimulate the group spirit among the men, enabling them to work better with one another, and improve their general morale to such an extent that the effect on their scholastic work is plainly evident.

Chemical engineering education in the United States is being studied by a prominent committee of the American Institute of Chemical Engineers. In their report they comment on the School of Chemical Engineering Practice, as follows:

"It is perhaps not out of place in this connection to refer to the new School of Chemical Engineering Practice of the Massachusetts Institute of Technology as embodying an important advance in chemical engineering education and as constituting an application of the case system on the full scale of modern industrial practice. In view of the eminently satisfactory results already obtained by the methods instituted in this school and the

exceptional enthusiasm of its students, a leaflet descriptive of the plan and operation of the school is appended as Exhibit J."

In considering the numerical growth of the School of Chemical Engineering Practice, it is well to remember that chemical engineering is not yet as well known as the older professions of civil, mechanical and electrical engineering and that therefore attendance in chemical engineering courses is not expected to equal that in these other fields. Furthermore, the School of Chemical Engineering Practice caters primarily to those men desiring post-graduate instruction and it is only recently that the necessity for such advanced training in chemical engineering has been generally recognized. In view of these facts the broad field from which the School of Chemical Engineering Practice draws its students is quite remarkable. Students now in the School of Chemical Engineering Practice or whose applications have been accepted for attendance during the coming year obtained their early collegiate training in thirty colleges and universities.

In view of the fact that this is only the third year for this School such enrollment indicates a sound growth and a wide recognition of the character of the post graduate instruction given in the Chemical Engineering Department of the Institute.

R. T. HASLAM, *Director.*

RESEARCH LABORATORY OF APPLIED CHEMISTRY

During much of the last year the Laboratory continued to feel the effects of the industrial depression, and its staff was therefore somewhat diminished. A special effort has been made, however, to concentrate on the more fundamental type of applied chemical problems, rather than to cover a wider range of comparatively minor subjects. Several new problems of importance have been secured recently so that, at the present writing, the following major problems are being studied:

1. General Motors Research Corporation: (*a*) The Mechanism of Lubrication. (*b*) Methods of Producing Anti-Knock Compounds. (Three men.)
2. Standard Oil Company of New Jersey: The Mechanism of Lubrication. (One additional man working in conjunction with the General Motors Research Corporation.)
3. National Lamp Works of the General Electric Company: A Study of Lamp Filaments.
4. Goodyear Tire and Rubber Company: The Production of High Grade Compounding Materials for the Rubber Industry.

5. Humble Oil and Refining Company: Special Problems in Oil Refining. (Two men.)
6. Ronald Trist and Company, Ltd., London, England: The Study of High Temperature Gaskets.
7. The National Tube Company: Fundamental Factors in the Corrosion of Iron and Steel.

Besides these major problems, the time of several men has been taken up continually with the solution of minor problems or in the prosecution of research of general interest financed by the funds of the Laboratory.

During the year, eleven regular members of the Laboratory staff resigned to accept outside positions; of these, eight have gone into industrial research, two are in teaching positions, and one has left to enter business. The Laboratory has been especially unfortunate in losing the services of its Director, Professor R. E. Wilson, and one of its Assistant Directors, Dr. C. S. Venable, both of whom have taken highly responsible research positions with industrial concerns.

To fill these vacancies, Professor R. T. Haslam, Director of the School of Chemical Engineering Practice, has been appointed Director of the Laboratory to succeed Professor Wilson, and Professor Whitman becomes an Assistant Director with Doctor Parsons. In addition to these appointments, seven Research Assistants have been added to the staff in order to carry on properly the work of the Laboratory.

Continued and increased emphasis has been placed on the educational functions of the Laboratory. During the past year, the thesis problems of forty-three men have been supervised by various members of the staff: two for the Ph.D. degree, twelve for the M.S. degree, and twenty-nine for the S.B. degree. Six members of the staff have given graduate courses in the Department. The educational subjects given included three advanced courses in Industrial Chemistry, a lecture and laboratory course in Applied Colloid Chemistry, one course in Organic Electrochemistry, and a series of lectures on the Organization and Methods of Industrial Research.

From the income of part of the Cabot and Charlotte B. Richardson funds, it has been possible to secure several pieces of much needed apparatus. The purchase of a complete Carl Zeiss ultra-microscope has made it possible to broaden greatly the scope of our activities in Applied Colloid Chemistry. A Sperry

gyroscope has been secured to aid in the study of the mechanism of lubrication. Other purchases included several much needed pieces of electrical apparatus.

The fundamental work of the Laboratory during the previous years has borne fruit in the last year in the publication of a large number of articles of considerable industrial importance. During the past year, 23 papers were published, 10 additional were submitted and accepted for publication, and 15 are in preparation at the present time. In addition to these publications, 11 papers were read at the Fall Meeting of the American Chemical Society at Pittsburgh, one at the Technical Sessions of the American Petroleum Institute, and one at the Spring Meeting of the American Electrochemical Society at Baltimore. More than half of these were based on the results of investigations financed by outside companies who have kindly given permission for their publication. A special appropriation from the Institute also aided greatly in making possible more effective work along these lines.

From the standpoint of the production of valuable results and contributions to the literature, the past year has undoubtedly been the most successful that the Laboratory has known, and the prospects for the future are especially bright.

R. T. HASLAM, *Director.*

DEPARTMENT OF NAVAL ARCHITECTURE AND MARINE ENGINEERING

The outstanding event of the academic year was the completion of the Pratt Building and its occupation by the Department. This building proved a very great boon indeed, and the work of the Department was carried on with greater comfort and convenience than had hitherto been the case. The establishment of the Department library in the building was also a very great convenience and students make much more use of the books than they did when they had to go to the main library for them.

The number of civilian students continued to be satisfactory

and the enrollment of naval officers for the Master's degree was the highest that has yet been reached.

Two members of the staff, Professor Owen and Professor Keith, were promoted from Assistant to Associate Professorship in recognition of the excellent service they had rendered to the Department.

In order to obtain instruction in the most recent developments of Marine Turbines, a course of lectures was given by Mr. Burkhardt, Engineering Designer of the Bath Iron Works, Maine. These lectures were given on Saturdays in May and were open to all students of the Institute. They were very well attended and gave great satisfaction to the students, as Mr. Burkhardt confined his work entirely to design and avoided spending any time on work which could be covered by textbooks.

The equipment of the Department was increased by the addition of a motor-driven mortiser machine in the Model Shop, which proved very satisfactory and saved a great deal of time.

By the kindness of the American Committee of Lloyds Register of Shipping, the Institute was presented with a Scholarship in Naval Architecture and Marine Engineering at the value of five hundred dollars per annum and tenable for three years. The scholarship was awarded on the results of the freshman-year examinations, and Mr. Warner Lumbard of Dorchester was the successful student and has the distinction of receiving the first scholarship. The importance of this scholarship cannot be overrated as it will attract to the subject some of the best of the freshmen and will strengthen the shipbuilding interests of America just where they require it the most.

JAMES R. JACK.

DEPARTMENT OF ECONOMICS AND STATISTICS

Two important developments have been made during the past year: (1) the appointment of Mr. Willard E. Freeland as Assistant Professor of Marketing; and (2) the pushing back of instruction in Business Management to the third term of the third year.

Ever since the establishment of the Course in Engineering Administration in 1915, the Department has kept in mind the

desirability of providing for specialized instruction in Marketing' but the interruptions due to the war and the difficulty of finding in this field a specialist who would be willing to give up a business position for academic work have delayed the appointment. The selection of Professor Freeland, who came to the Institute in March, 1922, on a half-time basis, has solved this problem.

This rearrangement also made it possible to alter the schedule of studies so that Business Management can be given at an earlier point in the curriculum. By beginning this subject in the third year, students who secure employment in the summer vacation are able to make more practical use of their experience.

The addition of a reader in Economics has strengthened the work of the Department, more particularly in instruction in Political Economy, the large class of the junior year.

As a result of a considerable growth in the size of the classes in Accounting, an instructor on a full-time basis has been added to the staff. Accounting is now required for Course I, Option 3, and Course VII. Room 1–235, a drawing room formerly occupied by the Department of Naval Architecture, was assigned to our special use for the classes in Accounting and Statistics and has proved most serviceable.

The members of the Department have engaged in a considerable amount of public service and academic work in addition to their regular Institute duties during the past year. In September, 1921, Professors Dewey and Doten were called to Washington by Secretary Hoover to serve on an advisory committee in organizing and conducting the President's Conference on Unemployment. Professor Doten completed on June 30 a three years' service as a member of a Joint Advisory Committee of the American Economic and Statistical Associations on the Fourteenth Census. Professor Doten has also served as consulting specialist in the Department of Agriculture since January, and has been called upon by the Bureau of Markets and Crop Estimates in improving their statistical methods. Professor Shugrue was reëlected Assistant Secretary of the American Statistical Association in the summer of 1921. During the summer school, 1921, Professor Shugrue had charge of a class in Cost Accounting and a class in General Accounting at Columbia University. In the summer of 1921, Professor Schell, aided by a grant from the

American Shipbuilding Corporation, conducted a research in Business Management; this study furnished a considerable amount of new material which Professor Schell has incorporated in the cyclostyled notes provided for his class. Professor Schell during the past year also gave a course of lectures on Industrial Operation at the Harvard Medical School, and courses on the Principles of Business, Business Analysis, and Business Organization at the School of Commerce and Finance, Northeastern University; also a course for the Lowell Society of Industrial Science on the Profit and Loss Viewpoint in Plant Management, at Lowell, Massachusetts. Professors Dewey and Shugrue published in June, 1922, the volume, "Banking and Credit"; and Columbia University has published "The Evolution of People's Banks," by Professor Tucker.

DAVIS R. DEWEY.

DEPARTMENT OF ENGLISH AND HISTORY

Courses on The Fine Arts in Modern Life, The Appreciation of Music, and the Development of Music were innovations in the list of General Study options offered by the Department. They were elected by a considerable number of students, who showed real interest, and who, under the instruction of Professor Seaver and Mr. Penfield Roberts, made genuine progress in artistic and musical appreciation. The new courses have quickly justified themselves, and will be given again in the coming year.

The Technology undergraduate is conscious of his need for training in public speaking, and in response to numerous requests the General Study course in this subject was revived, and will be continued. The course which gives men training in informal speaking through the presentation of committee reports was given in the third term to about half of the fourth-year class in Chemical Engineering. The men prepared careful reports on technical subjects, the presentation of which was criticized by Professor C. S. Robinson of the Chemical Engineering Department, as well as by members of the Department of English and History. The coöperation of members of two Departments in giving this type of training to students about to graduate produced

a very valuable course, which it is hoped may eventually be required of Seniors in other professional Courses.

In the fundamental courses given by the Department to first-year and second-year students the work has been carried on much as in the last two years. Special mention should be made of the lectures in History given by George Grafton Wilson, Professor of International Law at Harvard, Robert H. George, Assistant Professor of History at Yale, and Professor Josef Redlich of the University of Vienna.

HENRY G. PEARSON.

DEPARTMENT OF MODERN LANGUAGES

Three courses in German, one of Elementary, one of Intermediate, and one of Advanced grade were given during the summer of 1921. The Intermediate and Advanced were given by Professor Vogel and the Elementary by Professor Kurrelmeyer. Two courses in French, one of Elementary and one of Intermediate grade were given by Professor Langley.

Professor Vogel again served as Chief Reader in German, and Professor Langley as Reader in French for the College Entrance Examination Board in New York.

The instruction in German, French and Spanish during the school year was imparted by Professors Vogel, Kurrelmeyer, Langley, and Messrs. Plath, Moore, Kelsey and Sexton.

Courses in Elementary, Intermediate and advanced German and French and in Elementary Spanish were given. The average size of sections was 21, the average number of hours per week in German per instructor was 16. The average number of hours per week per instructor in French was 13 for full time instructors.

Three courses in General Studies (electives) in German were given, two by Professor Vogel and one by Professor Kurrelmeyer, and two courses in General Studies (electives) in French which were given by Professor Langley.

FRANK VOGEL.

DEPARTMENT OF MATHEMATICS

During the year 1921–1922, the principal changes in mathematical instruction have been:

The somewhat more systematic grading of students in "credit sections."

The devotion of a few exercises in the second term of the second year to alignment charts or empirical equations.

The introduction of Professor Phillips' new text on Differential Equations in the third-term work of the second year.

The formal work in differential equations completed in recent years in the second term of the second year has been followed by third-term work in theoretical mechanics. Professor Phillips' new text is much better adapted to give students the ability to apply differential equations to concrete problems. The work in alignment charts and in empirical equations has proved so time-consuming in proportion to its somewhat limited mathematical content that it will not, for the present, be continued.

In regard to the "credit sections," it is still too early to pronounce a definitive opinion as to whether it is on the whole best to attempt to segregate superior students. The psychological reaction of any such plan is more or less complicated, but on the whole it seems clear that the instruction can be more successfully focussed if the range of mathematical capacity in a given section is not too wide. It has not seemed expedient in mathematics to introduce any modification of the general program or of the final examination. It has also seemed unwise to separate weaker students from those of average capacity. The general aim has been to enrich the instruction somewhat for the abler students by giving them more opportunity to work independently and to exercise their powers, at least occasionally, on more difficult problems.

The statistics of the principal undergraduate classes have been as follows:

	Students	*Sections*
In the first term:		
Elementary Calculus, M11 (first year)	678	25
Integral Calculus, M21 (second year)	528	24
In the second term:		
Elementary Calculus, M11 (Junior Grade)	110	4
Analytic Geometry, M12 (first year)	568	19
Calculus and Differential Equation, M22 (second year	551	19

	Students	*Sections*
Integral Calculus, M21	118	4
In the third term:		
Analytic Geometry, M12 (first year Junior Grade)	116	5
Analytic Geometry and Calculus, M13 (first year)	553	22
Applied Mathematics, M23 (second year)	420	14

The principal subjects have been offered in each term as well as in the summer.

Two members of the department — Professor Lipka and Doctor Taylor have had leave of absence for foreign study, Doctor Lipka spending most of the year at the University of Rome, Doctor Taylor holding a Belgian fellowship at Brussels. Both have found the year very profitable and resume their work with refreshed energy.

In Doctor Lipka's absence the work in Mathematical Laboratory, of which he has long made a specialty, has been carried by Doctor Rutledge with the coöperation of Professor H. C. Bradley of the Department of Drawing and Descriptive Geometry. Other elective and graduate courses have been given during the year as follows: Aeronautics and Dynamics by Professor Moore, Advanced Calculus and Higher Geometry by Professor Woods, Theoretical Electricity by Professor Phillips, Least Squares by Professor Bartlett, Applications of Mathematics to Chemistry by Professor Hitchcock, Mathematical Laboratory, Theory of Functions and Modern Algebra by Doctor Rutledge, Fourier's Series and Integral Equations by Doctor Wiener and Vector Analysis by Doctor Zeldin. The large attendance on several of these courses has been very gratifying.

Professor Phillips has lectured on Relativity at the American Academy of Arts and Sciences, and participated, by invitation, in the symposium on Relativity and the Quantum Theory at the Toronto meeting of the American Association for the Advancement of Science.

The development of mathematical research and publication has continued during the year, as will be noted by the list of published papers. The new Journal of Mathematics and Physics has been cordially received by the mathematical public and many invitations for exchange with American and foreign publications have been accepted.

Besides Professor Lipka and Doctor Taylor, who have had

leave of absence, special grants for research have been made to Professor Hitchcock, Doctor Wiener and Doctor Zeldin.

The organization of an undergraduate Mathematical Club should be noted.

H. W. TYLER.

DEPARTMENT OF MILITARY SCIENCE AND TACTICS

This department operated part of the past year with ten commissioned officers and seven non-commissioned officers and mechanics. These numbers enabled the technical units to carry out their work effectively.

During the year changes in personnel have been as follows: Major A. E. Maish replaced Major John Mather in the Ordnance Unit; Captain L. L. Clayton replaced Captain J. T. Watson in the Signal Corps Unit; Major J. C. McDonnell assigned in charge of the Air Service Unit; Lieutenant D. A. D. Ogden assigned to assist in the Engineer Unit. First Sergeant James T. Vaughn died May 23, 1922.

The compulsory work, extending over the freshman and sophomore years, is known as the Basic Course. It contains only those things which officers of all branches of the army should know. The optional work during the junior and senior years, is known as the Advanced Course. It adds to the basic training the special technical knowledge necessary for Reserve Officers. The division of the Freshman year into a first period of five weeks of infantry drill, followed by fifteen weeks of inside work during the inclement weather, and returning to drill during the spring term has been found to be a fundamentally sound division of the time.

A large part of the interest in the Advanced work depends upon the success of the six weeks summer camps which are required of all students taking the advanced work under pay, and which are open to basic students under certain restrictions. Highly successful camps were held this summer. In competition with students from other educational institutions our students continue to prove their interest and their proficiency. They even won prizes for excellency in close order Infantry Drill when competing

with students from Military Educational Institutions. The Engineer Unit won a twelve-inch cup at Camp A. A. Humphreys; the Artillery Unit won the competitive infantry drill last year and again this year at Fort Monroe, Virginia.

A part of the graduation exercises this year was devoted to the presentation of commissions as Second Lieutenants in the Officers' Reserve Corps to one hundred and six graduates of the Reserve Officers Training Corps Course. The Professor of Military Science and Tactics was permitted to address the students and to administer the oath of office. The opportunity to insert this part of the program into the Graduating Exercises has been very much appreciated by the Military Science Department and by the War Department.

There have been no special additions of equipment during the past year, and the Department is approaching a condition where requisitions for supplies in bulk are not required.

The Department has arranged to issue uniforms to the students taking Advanced Courses. These uniforms will be similar to the olive drab uniform of officers of the Regular Army except that the collar will be turned down and more comfortable for those not wearing the uniform habitually. The United States will defray the expenses of the uniforms which will become the property of the students. By slight alterations these uniforms may be converted into the regulation officers' uniform for use by the students after they receive their commissions in the Officers' Reserve Corps.

The work of the Department has received especial favorable comment by the Inspector of Reserve Officers' Training Corps Affairs at Headquarters of the First Corps Area, in Boston. An Inspection was made by this Army Officer during the month of May.

Major General Edwards attended the final parade of the Battalion of Freshmen on May 24, and addressed the students after the parade.

The Department reports a satisfactory year.

The enrollment in the Advanced Course, optional on the students' part, has been very gratifying. The distribution on the students according to the branch of service is shown by the following table:

Branch of Service	Class of 1923	Class of 1922	Attendance at Camp in 1922	Commissioned 2d Lt. in 1922
Coast Artillery	71	37	68	32
Engineer	61	46	52	42
Signal Corps	38	29	32	3
Air Service	22	4	24	3
Ordnance	47	37	37	26
Totals	239	133	213	106

Total Advanced Students, 372.

J. B. CHRISTIAN, *Colonel*, C. A. C., (DOL).

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

TREASURER'S REPORT

FOR THE YEAR ENDED JUNE 30, 1922

August 30, 1922.

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, 1922.

We have established the assets and liabilities of the Institute as set forth in the balance-sheet of the printed report of the Treasurer, including a comparison of the detailed list of securities with the certified list furnished by the Old Colony Trust Company.

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 and have satisfied ourselves that all receipts of money have been acknowledged on the books and deposited in the banks and that the cash balances shown by the books on June 30, 1922, were actually available and that these balances are correct.

We have also extended our audit to cover the transactions pertaining to the Wyeth and Hewett Funds, as the accounts of these funds are kept on the Institute books although not shown in the balance-sheet and income accounts.

Very respectfully,

HARVEY S. CHASE AND COMPANY,
Certified Public Accountants.

REPORT OF THE AUDITING COMMITTEE TO THE CORPORATION OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

September 22, 1922.

This Committee reports that in carrying out its duties it has employed Messrs. Harvey S. Chase and Company, Certified Public Accountants, to examine the books and audit the accounts of the Treasurer and Bursar for the year ended June 30, 1922. The report of this company is attached.

AUDITING COMMITTEE,
MERTON L. EMERSON,
E. W. ROLLINS,
WILLIAM L. PUTNAM.

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, 1922, 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:

Subscriptions to M. I. T. Educational Endowment Fund	$775,695.50	
Estate of Maria A. Evans, for Evans Fund	61,192.55	
Estate of Charlotte A. Spring, for Andrew Hastings Spring Fund	50,000.00	
Estate of Charles T. Baker, for Charles Tidd Baker Fund	20,000.00	
Estate of George L. Parmelee, for Scholarship Fund	17,641.69	
Estate Anna P. Rogers, for Henry Bromfield Rogers Fellowship	10,057.03	
Subscriptions and additions to M. I. T. Alumni Fund	7,442.87	
Anonymous Donor, for Walker Memorial	5,000.00	
Mrs F. J. Moore, for Tech. Matrons' Teas Fund	4,000.00	
Estate of Charles Choate, for Choate Fund	1,925.52	
Estate T. W. Bailey, for Bailey Fund	81.10	
		$953,036.26

Gifts for Research, etc.:

American Tel. and Tel. Co., for Research Division, E. E. Dept.	$10,000.00	
Subscriptions to Tech Plan Research Fund	4,100.00	
Portland Cement Association, for Roads Research	3,000.00	
American Tel. and Tel. Co., for Library Fund	2,000.00	
William Underwood Co., for Food Engineering Fund	1,000.00	
Paper Insulated Cable Research Committee, for Research	600.00	
		20,700.00

Miscellaneous Gifts:

General Electric Co., for Course VI-A	$5,000.00	
E. I. du Pont Co., for du Pont Fellowships	1,500.00	
Ralph Sargent, for Mechanical Engineering Department	1,000.00	
Monsanto Chemical Works, for Fellowship	500.00	
Estate of F. E. Weston, for Scholarships	400.00	
Miscellaneous for General Purposes	214.93	
Miscellaneous for Course XV Fund	135.00	
H. E. Fales for Library	100.00	
		8,849.93
		$982,586.19

Of the above total, the sum of $26,149.93 was given for current expenses or research and has been carried into the income for the year.

The M. I. T. Educational Endowment Fund on June 30, 1922, amounted to $6,773,948.79. A condensed statement follows herewith:

Subscriptions		*Payments*
$4,000,000.00	George Eastman	$4,000,000.00
2,927,649.00	Alumni and Others	2,071,530.79
1,082,330.00	Technology Plan Contracts	702,418.00
$8,009,979.00	Total	$6,773,948.79

Attention is called to the apparent reductions in both Income and Outgo over the preceding year (pp. 7 and 9).

The reduction in Income is largely accounted for by the discontinuance of payments by the State of Massachusetts ($100,000 per year for the previous ten years), and because the *net* income only from Dormitories is entered instead of the gross amount, as formerly.

The apparent reduction in Outgo is on account of entering *net* expenses only of Walker Memorial, Summer Camp and Dining Service.

Again, comparing with last year's figures, there is an apparent reduction in the total Salaries of Teachers, Regular Courses (p.8) $837,317.36. The actual payments on this account during the Fiscal Year ended June 30, 1921, were $864,517.13, including bonus, and for the year ended June 30, 1920, $588,511.51, including bonus. It will be remembered that the Salaries of Teachers were paid on a twelve-month basis, prior to 1921, at which time they were changed to a ten-month basis — hence the payments for the year ended June 30, 1921, covered not only the entire Academic Year of 1920-21, but also three monthly payments (approximately $100,000), on account of the previous Academic Year.

For comparison by Academic (not Fiscal) Years in round figures, the totals are

1920	.	$588,000
1921	.	764,000
1922	.	837,000

Respectfully submitted,

EVERETT MORSS,
Treasurer.

September 30, 1922.

SCHEDULE A

FINANCIAL RESULT OF THE YEAR ENDED JUNE 30, 1922 COMPARED WITH THE PREVIOUS YEAR

	1921–1922	*1920–1921*
Current Outgo, (Schedule C)	$2,054,649.81	$2,177,878.19
Current Income, (Schedule B)	2,012,008.98	2,147,068.22
Excess expenditures	$42,640.83	$30,809.97
PROFIT AND LOSS		
Net Loss, (Schedule S)	$12,260.79	$10,662.10
	$54,901.62	$41,472.07
Excess expenses of funds, charged to funds	42,465.58	6,308.94
Decrease of Current Surplus, (Schedule S)	$12,436.04	$35,163.13

SCHEDULE B
INCOME

	Regular Courses	*Research and Funds*	*Total*
INCOME FROM STUDENTS:			
(*a*) Tuition Fees	$1,002,211.29		
(*a*) Laboratory Fees	61,844.95		
Locker Fees	3,792.72		
Entrance Examination Fees	4,198.00		
Condition Examination Fees	18,496.00		
Sale of Lecture Notes, etc.	4,193.43		
Registration Fees	4,860.00		
Dormitory, Net (Schedule C-6)	1,937.49		
	$1,101,533.88		$1,101,533.88
INCOME FROM INVESTMENTS:			
Endowments for General Purposes, (Schedule P)	$530,081.04	$1,085.70	$531,166.74
(*a*) Endowments for Scholarship Purposes, applied	39,470.00	.....	39,470.00
Endowments for other Designated Purposes	58,268.65	75,070.63	133,339.28
(*b*) Net, (Schedule Q)	$627,819.69	$76,156.33	$703,976.02
GRANTS FROM NATION			
Federal Aid Income from Land Grant,			
Act 1862	$5,306.68		
Act 1890	16,666.67		
	$21,973.35		$21,973.35
GIFTS FOR			
Course VI-A	$5,000.00		
Current Expenses	214.93		
Technology Plan Research		$4,100.00	
	$5,214.93	$4,100.00	$9,314.93

(*a*) Total Tuitions and Scholarships, including $6,635.00 applied to Scholarships from the Laboratory Fees Income, $1,048,316.29.
(*b*) Additional Income offset by Accrued Interest, Expenses, etc. $43,732.34.

	Regular Courses	*Research and Funds*	*Total*
MINOR FUND EARNINGS:			
Total, (Schedule R)		$106,703.50	$106,703.50
INCOME FROM OTHER SOURCES:			
Division of Laboratory Supplies	$13,235.24		
Interest	12,906.45		
Huntington Hall, etc.	3,500.00		
U. S. Smelting, Refining and Mining Co.	3,000.00		
Walker Building	10,000.00		
Chem. Eng. Practice Fund . .	25,000.00		
Bursar's Fund Reimbursements		$865.61	
	$67,641.69	$865.61	$68,507.30
Total Income, (Schedule A) .	$1,824,183.54	$187,825.44	$2,012,008.98

SCHEDULE C
OUTGO

	Regular Courses	*Research and Funds*	*Total*
SALARIES OF TEACHERS	$837,317.36	$51,742.75	$889,060.11
WAGES ACCESSORY TO TEACHING:			
Stenographers and Assistants .	25,853.12	7,777.22	33,630.34
DEPARTMENT SUPPLIES AND REPAIRS			
(Schedule C-1)	162,508.58		162,508.58
DIVISION OF INDUSTRIAL CO-OPERATION AND RESEARCH	22,208.16		22,208.16
ADMINISTRATION AND GENERAL EXPENSE:			
Salaries of Officers	50,915.35		
Salaries of Assistants, Stenographers, etc.	68,460.97		
Salaries of Library Assistants .	17,254.38		
Printing and Advertising (Schedule C-2)	29,171.35		
Fire Insurance	7,311.90		
General Expense (Schedule C-3)	86,417.47		
	$259,531.42		$259,531.42
OPERATION AND MAINTENANCE OF PLANT:			
Power Plant Operation (Schedule C-4)	$158,208.31		
Building Service, Salaries . . .	170,966.70	7,933.52	
Plant Repairs, Alterations and Maintenance (Schedule C-5) .	94,907.56		
	$424,082.57	$7,933.52	$432,016.09
EXPENSES OF MINOR FUNDS (excluding salaries):			
Total, (Schedule R)		$69,380.54	$69,380.54
*AWARDS:			
Edward Austin Fund		$7,539.38	
Robert A. Boit Fund Prizes . .		150.00	
Teachers' Fund		11,639.86	
Bursar's Fund		746.00	
Fellowship		11,498.88	
Whitney Fund, Dormitory . . .		132.50	
Whitney Fund, T. C. A. . . .		1,500.00	
Whitney Fund, Students' Fees .		2,375.00	

*Other than for Undergraduate Scholarship.

	Regular Courses	*Research and Funds*	*Total*
AWARDS — *Continued*			
Whitney Fund, Undergraduate Dues		$2,193.00	
Architectural Prizes		400.00	
		$38,174.62	$38,174.62
PREMIUMS CHARGED OFF:			
General Investments	$5,595.00		
Rogers Memorial Investments	34.00		
Draper Fund Investments	22.00		
	$5,651.00		$5,651.00
EXPENSES:			
Chemical Engineering Practice Fund		$25,000.00	
Pratt Naval Architectural Fund		12,904.35	
*Jonathan Whitney Fund		497.72	
Edna Dow Cheney Fund		750.84	
Technology Matrons' Teas Fund		94.67	
Cilley Fund		6,230.22	
F. W. Boles Memorial Fund		1,844.50	
Samuel Cabot Fund		2,900.00	
Charles Flint Fund		169.72	
Charlotte B. Richardson Fund		1,709.40	
Technology Plan Research		972.64	
John Hume Tod Fund		168.31	
E. K. Turner Fund		2,040.00	
Dining Service, (Schedule C-7)	.....		
Summer Camp, 1921	$10,404.17		
Walker Memorial (Schedule C-8)	10,267.91		
APPROPRIATIONS:			
Applied Chemical Research	9,000.00		
Industrial Physics	8,000.00		
Ednah Dow Cheney Fund	700.00		
Mathematical and Physical Journal	2,000.00		
Hale Spectroscopic Fund	2,500.00		
New Equipment and Construction	30,604.70		
For new Wind Tunnel	12,000.00		
SOCIETY OF ARTS. Expenses	1,729.80		
	$87,206.58	$55,282.37	$142,488.95
Total Outgo, (Schedule A)	$1,824,358.79	$230,291.02	$2,054,649.81

*Other than scholarships or awards.

SCHEDULE C-1

DETAIL OF DEPARTMENT EXPENSES (Net)

Department	*Expended*	*Overdraft*
Aeronautics	$1,113.82	.....
Architecture	2,494.71	.....
Biology	2,255.16	$5.16
Chemistry	22,248.07	.....
Chemical Engineering, No. 1	3,000.00	.....
Chemical Engineering, No. 2	1,012.60	12.60
Chemical Engineering, No. 3	496.22	.....
Chemical Engineering, Practice School	19,336.65	.....
Civil and Sanitary Engineering	2,022.82	.....
Dean, Office of the	100.52	.....
Drawing	608.07	208.07
Economics	1,500.00	.....
Economics Special	1,600.00	.....
Engineering Administration, Special	1,424.66	.....
Electrical Engineering	7,556.60	56.60
Electrical Engineering, Special No. 1	3,485.26	.....
Electrical Engineering, Special No. 2	8,000.00	.....
English and History	842.21	42.21
English and History, Special	1,500.00	.....
General Library	13,471.65	471.65
Geology	2,173.80	373.80
Geology, Special	138.98	.....
Mathematics	1,337.39	87.39
Mechanical Engineering	19,553.73	53.73
Mechanical Engineering, Special	6,016.35	.....
Medical	1,146.53	.....
Military Science	1,668.23	.....
Mining Engineering	4,701.03	.....
Metallurgy	18.10	.....
Modern Language	663.60	.....
Naval Architecture	3,182.26	.....
Physical Chemistry	6,620.53	28.28
Physical Training, Gymnasium	436.04	36.04
Physical Training, Tech Field	4,801.52	.....
Physics	15,200.00	.....
Physics, Special	219.57	.....
United States Officers Ordnance Course	1,937.43	.....
Totals	$163,884.11	$1,375.53
Less Overdrafts, (Schedule D-2)	1,375.53	
Net Expenses (Schedule C)	$162,508.58	

SCHEDULE C-2
DETAIL OF EXPENSE OF PRINTING AND ADVERTISING (Net)

For Administration Offices	$10,223.67
Advertising in Technology Publications	1,322.00
Other Publicity	1,060.81
Register of Students	329.00
President's and Treasurer's Reports	938.00
Catalog	874.48
Courses of Study	3,452.00
Examinations	2,282.50
Circular of General Information	1,568.50
Directory of Students	1,561.00
Summer Courses and Summer Camp Circulars	1,426.00
Reprints and Binding	726.34
Tabular View	1,654.30
Technology War Record	1,200.00
Bulletins	552.75
Total, (Schedule C)	$29,171.35

SCHEDULE C-3
DETAIL OF ITEMS OF GENERAL EXPENSE (Net)

Administration Expense	$8,166.92
Carfares, etc.	519.24
Express, Freight, Telegrams, etc.	452.26
Fees, Dues, Commissions, etc.	40,830.52
General Office Supplies	1,391.94
Expenses of Graduation, Inauguration, etc.	8,623.50
Ice, Spring Water	2,514.54
Postage	3,698.81
Traveling Expenses	1,640.61
Telephone Service	12,290.16
Trucking	4,314.92
Photostat	479.90
Collection of Endowment Fund	694.27
Miscellaneous	2,597.56
Total	$88,215.15
Less Credits Blue Printing	$580.99
Laundry	845.49
Neostyle	371.20
Total, (Schedule C)	$86,417.47

SCHEDULE C-4
DETAIL OF POWER PLANT OPERATION (Net)

Coal	$104,621.02
Water	10,395.06
Gas	3,274.02
Power Plant and Boiler Room Supplies	2,499.32
Repairs	23,418.57
Trucking	584.51
Salaries	29,014.64
	$173,807.14
Less Sales of Electricity	15,598.83
Total, (Schedule C)	$158,208.31

SCHEDULE C-5
DETAIL OF PLANT, REPAIRS, ALTERATIONS AND MAINTENANCE

	Repairs	*Alterations*	*Supplies*	*Total*
General Educational Buildings:				
Group No. 1	$5,372.82	$1,840.26	$963.66	$8,176.74
Group No. 2	4,441.99	665.87	1,109.41	6,217.27
Group No. 3	5,824.26	685.32	1,092.99	7,602.57
Group No. 4	5,527.29	1,421.14	926.21	7,874.64
Group No. 5	332.99	289.82	274.67	897.48
Group No. 8	2,644.72	.....	697.50	3,342.22
Group No. 10	4,151.19	182.28	910.44	5,243.91
Rogers Building, Boston	4,121.06	.....	363.55	4,484.61
Building 35, Mechanic Arts	680.85	.....	193.53	874.38
Building 37, Gas Laboratory	103.03	.....	10.66	113.69
Service Building	1,384.87	.....	257.75	1,642.62
President's House	2,039.27	.....	.....	2,039.27
Furniture	3,957.20	.....	.....	3,957.20
Elevators	1,004.69	.....	.....	1,004.60
Garage	204.22	.....	41.68	245.90
Compressor House	171.92	.....	.....	171.92
Building 17, Storage	1,425.09	.....	.....	1,425.09
Building 19, App. Chem.	33.42	.....	49.32	82.74
Building 12, Hangar	374.71	.....	.....	374.71
Building 21, Gas Engine Lab.	72.64	.....	30.20	102.84
Building 30, Wind Tunnels	698.65	.....	.....	698.65
Rifle Range	158.81	.....	.....	158.81
Fire Alarm	645.17	.....	.....	645.17
Grounds	24,009.87	2,238.65	.....	26,248.52
Rubbish	2,192.80	.....	.....	2,192.80
Keys	68.75	.....	.....	68.75
Boat House	.....	5,816.92	.....	5,816.92
New Garage	.....	1,459.53	.....	1,459.53
Shop Maintenance	306.97	.....	.....	306.97
Undistributed	1,436.95	.....	.....	1,436.95
Total, (Schedule C)	$73,386.20	$14,599.79	$6,921.57	$94,907.56

SCHEDULE C-6
DORMITORY ACCOUNT (Net)

Income:		
Cash	$44,213.36	
Less Rental Refunds	1,044.47	
		$43,168.89
Expenditures:		
Salaries	$10,413.84	
Laundry	1,343.56	
Heat, Light and Power	5,212.46	
Water	1,422.28	
Repairs	11,765.12	
Supplies	2,265.33	
Insurance	461.00	
Trucking, etc.	51.27	
Printing, etc.	74.24	
New Equipment	424.30	
Interest on Mortgage Loan (Whitney Fund)	7,798.00	
Total Expense		41,231.40
Net Income (Schedule B)		$1,937.49

SCHEDULE C-7

DINING SERVICE ACCOUNT (Net)

Income:

Cash	$135,269.36	
Cigars and Candy	2,194.92	
Total		$137,464.28

Expenditures:

Food	$57,911.11	
Cigars and Candy	1,987.38	
Salaries	44,713.55	
Light, Heat, Power, etc.	4,720.05	
Laundry	2,933.77	
Printing and Advertising	1,016.52	
Ice, Refrigeration, etc.	1,854.37	
Repairs	3,844.80	
Administration Expense and Telephone	309.76	
Dining-room and Kitchen Utensils	4,810.16	
Soap, Cleansers, etc.	386.61	
Express, Freight and Trucking,	317.41	
Insurance	365.00	
Equipment Depreciation	7,500.00	
Dining Service Reserve Fund	4,793.79	
Total		$137,464.28

SCHEDULE C-8

WALKER MEMORIAL ACCOUNT (Net)

Income:

Undergraduate Dues	$12,988.79	
Games	6,249.12	
Net Income		$19,237.91

Expenditures:

Salaries	$10,681.78	
Light, Heat, Power, etc.	5,224.47	
Repairs, Alterations and Upkeep	11,383.53	
Telephone, Trucking and Administration Expense	322.95	
Building and Janitors' Supplies	531.67	
Insurance	342.00	
Equipment	585.60	
Entertainment	433.82	
Net Expense		29,505.82
Net Loss (Schedule C)		$10,267.91

SCHEDULE D

TREASURER'S BALANCE SHEET

1
INVESTMENT ASSETS

Investments and Real Estate, (Schedule H)	$15,450,991.26
Cash: In Banks for Investment	286,366.90
Cash: Advanced (carried down per contra)	49,638.63
Total	$15,786,996.79

2
CURRENT ASSETS

Cash available for General Purposes	$11,675.76
Accounts Receivable, (Schedule D-1)	67,580.06
Students' Fees Receivable	1,713.77
Students' Deposits Receivable	1,924.25
Unexpired Insurance	21,825.74
Inventories and Advances for 1922–23 (Schedule D-2)	134,197.65
Total	$238,917.23

3
EDUCATIONAL PLANT ASSETS

Land, Buildings and Equipment, (Schedule J)	$11,434,460.02
	$11,434,460.02

SCHEDULE D

JUNE 30, 1922

1
ENDOWMENT AND OTHER FUNDS

Funds, (Schedule Q)	$15,786,996.79
	$15,786,996.79

2
CURRENT LIABILITIES

Minor Funds, (Schedule R)	$74,692.72
Borrowed from Investment Assets (per contra)	38,870.58
Accounts Payable	1,810.30
Tuition in Advance — Summer School	53,370.90
Summer Camp, 1921, Deposits	1,110.59
Summer Camp, Outside Students' Fees	95.00
Students' Deposits for Uniforms	669.13
Students' Deposits	7,980.97
Students' Deposits in Advance	3,383.95
Dormitories, Income in Advance	3,228.25
Undergraduate Dues	3,631.45
Deposit by Knights of Columbus	2,408.64
Dining-Room Coupons, Outstanding	824.69
Total	$192,077.17
Surplus available for Current Expense (Schedule S)	46,840.06
Total	$238,917.23

3
EDUCATIONAL PLANT AND CAPITAL ACCOUNTS

Endowment for Educational Plant (Schedule K)	$11,423,691.97
Borrowed from Investment Assets (per contra)	10,768.05
	$11,434,460.02

SCHEDULE D-1

DETAIL OF ACCOUNTS RECEIVABLE

For Account of Research Laboratory of Applied Chemistry	$12,744.18
Boston University	18,205.25
United States Veterans' Bureau	16,588.32
United States Naval Academy	6,185.12
Harvard Coöperative Society, Inc.	3,814.99
Miscellaneous Accounts	10,042.20
Total, (Schedule D)	$67,580.06

SCHEDULE D-2

DETAIL OF INVENTORIES AND ADVANCES FOR 1922–1923

Department Overdrafts, (Schedule C-1)	$1,375.53
Summer Session Salaries	500.00
Summer Camp 1922	4,068.75
Inventories — Notes held by Coöperative Society	2,911.75
Furniture from 95 Newbury Street	1,597.05
Dining Service, Food, Cigars, Utensils, etc.	21,202.73
Walker Memorial, Games, Candy, Cigars, etc.	413.30
Office Supplies	2,871.00
Building and Janitors' Supplies	2,694.01
Architectural Students' Supply Room, Stock	1,284.39
Stock Room: Pipe, Fittings, Lumber, Hardware, Paint, Oil, Glass and miscellaneous supplies	20,300.97
Division of Laboratory Supplies; Chemicals, Glassware, Platinum, etc.	74,978.17
Total, (Schedule D)	$134,197.65

SCHEDULE E

TOTAL CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR

Total Cash Receipts	$3,484,121.41
Total Cash Disbursements	3,430,275.48
Excess of Receipts	$53,845.93
Cash, June 30, 1921	244,196.73
Cash, June 30, 1922	$298,042.66

CASH BALANCE

Cash on Deposit at Banks	$295,704.60
Cash at Office	2,338.06
Cash Balance (as above)	$298,042.66

SCHEDULE H

INVESTMENTS, BONDS, STOCKS

Par Value	Description of Securities	Rate	Maturity	Balance June 30, 1921
	GOVERNMENT AND MUNICIPAL BONDS			
$15,000	Boston, City of, Highway	4%	1924	$15,000.00
20,000	Boston, City of, Sewerage	4%	1935	20,000.00
2,000	Brockton, City of, Water Supply	3½%	1934	.....
5,050	Canada, Dominion of, Ser. T. & F. T.	5½%	1934	5,050.00
200	Canada, Dominion of, War Loan	5½%	1937	200.00
16,000	Chicago, City of, Mich. Ave. St. Imp.	4%	1930	16,153.00
1,000	Cincinnati, City of, Street Imp.	4½%	1933	1,021.00
500	Cincinnati, City of, Street Imp.	4½%	1935	533.94
1,000	Cincinnati, City of, Street Imp.	4½%	1935	1,068.06
50,000	Cincinnati, City of, Fire Protection	4¼%	1936	52,300.00
6,500	Cincinnati, City of, Condemnation	4½%	1945	7,142.00
100,000	Columbus, City of, Water Extension.	4½%	1944	107,526.00
1,000	Everett, City of, Coupon, Paving	4%	1923	2,000.00
1,000	Everett, City of, Coupon, Paving	4%	1924	1,000.00
1,000	Everett, City of, Coupon, Paving	4%	1925	1,000.00
85,000	Gov. U. K. Great Britain and Ireland	5½%	1937	86,175.00
3,000	Kansas City, Bridge and Viaduct	4½%	1935	3,185.40
18,000	Kansas City, Sewer	4½%	1935	19,112.40
24,000	Kansas City, Blue River Sewer	4½%	1935	25,483.20
5,000	Kansas City, 23d St. Trafficway	4½%	1935	5,309.00
50,000	Los Angeles, City of, Water Works	4½%	1942	52,557.00
10,000	Los Angeles, City of, Water Works	4½%	1943	10,391.20
15,000	Los Angeles, City of, Water Works	4½%	1943	15,586.80
19,000	Milwaukee Co. House of Correction	4½%	1927	19,503.30
19,000	Milwaukee Co. House of Correction	4½%	1928	19,575.34
19,000	Milwaukee Co. House of Correction	4½%	1929	19,645.34
19,000	Milwaukee Co. House of Correction	4½%	1930	19,712.34
19,000	Milwaukee Co. House of Correction	4½%	1931	19,777.34
5,000	Milwaukee Co. House of Correction	4½%	1932	5,117.34
25,000	Montreal, City of, Canada	5%	1936	25,000.00
4,000	New Britain, City of, Conn., Water	4%	1939	.....
2,000	Newburyport, City of, Water Loan	3½%	1932	.....
60,000	New York, City of, Corporate Stock	4¼%	1964	62,400.00
5,000	New York, City of, Corporate Stock	4½%	1967	4,625.00
33,000	Norfolk, City of, Va., Appropriation	4%	1954	33,000.00
50,000	Omaha, City of, Nebraska	4½%	1934	52,837.00
50,000	Omaha, City of, Water Works	4½%	1941	53,761.00
50,000	Ontario, Province of, Debenture	5%	1926	50,000.00
50,000	Ontario, Province of, Debenture	5½%	1937	.....

SCHEDULE H

REAL ESTATE AND MORTGAGES

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$15,000.00	.....	$600.00
.....	.....	20,000.00	.....	800.00
$2,000.00	.....	2,000.00	.....	35.00
.....	.....	5,050.00	.....	277.75
.....	.....	200.00	.....	11.00
.....	$18.00	16,135.00	.....	640.00
.....	2.00	1,019.00	.....	45.00
.....	2.34	531.60	.....	22.50
.....	4.66	1,063.40	.....	45.00
.....	165.00	52,135.00	.....	2,125.00
.....	28.00	7,114.00	.....	292.50
.....	342.00	107,184.00	.....	4,500.00
.....	1,000.00	1,000.00	.....	80.00
.....	.....	1,000.00	.....	40.00
.....	.....	1,000.00	.....	40.00
.....	78.00	86,097.00	.....	4,675.00
.....	14.22	3,171.18	.....	135.00
.....	85.32	19,027.08	.....	810.00
.....	113.76	25,369.44	.....	1,080.00
.....	23.70	5,285.30	.....	225.00
.....	128.00	52,429.00	.....	2,250.00
.....	19.20	10,372.00	.....	450.00
.....	28.80	15,558.00	.....	675.00
.....	129.00	19,374.30	.....	855.00
.....	119.00	19,456.34	.....	855.00
.....	112.00	19,533.34	.....	855.00
.....	107.00	19,605.34	.....	855.00
.....	102.00	19,675.34	.....	855.00
.....	26.00	5,091.34	.....	225.00
.....	.....	25,000.00	.....	1,250.00
4,000.00	.....	4,000.00	.....	80.00
2,000.00	.....	2,000.00	.....	70.00
.....	57.00	62,343.00	.....	2,550.00
.....	.....	4,625.00	.....	225.00
.....	.....	33,000.00	.....	1,320.00
.....	236.00	52,601.00	.....	2,250.00
.....	198.00	53,563.00	.....	2,250.00
.....	.....	50,000.00	.....	2,500.00
50,687.50	.....	50,687.50	$796.16	.....

Schedule H (*Continued*)

Par Value	Description of Securities	Rate	Maturity	Balance June 30, 1921
	GOVERNMENT AND MUNICIPAL BONDS (*Continued*)			
$41,000	Ottawa, City of, P. of Q.	4½%	1930	$39,003.30
50,000	Philadelphia, City of, Penn.	4%	1947	51,460.00
50,000	Portland, City of, Ore., Dock	4½%	1945	50,796.00
50,000	St. Paul, City of, Pt. Imp. Re. Fund.	4¼%	1936	51,797.00
3,000	Salem, City of, Mass., Tax Exempt	4%	1923	4,000.00
5,000	Salem, City of, Mass., Tax Exempt	4%	1923	5,000.00
5,000	Salem, City of, Mass., Tax Exempt	4%	1924	6,000.00
5,000	Salem, City of, Mass., Tax Exempt	4%	1924	5,000.00
6,000	Salt Lake City, Utah, Sewerage	4½%	1934	6,218.55
34,000	Salt Lake City, Utah, Water	4½%	1934	35,238.45
15,000	San Francisco, City and Co. of, School	5%	1937	16,034.00
10,000	San Francisco, City and Co. of, Expos.	5%	1939	10,750.00
21,000	Savannah, City of, Drainage Systems	4½%	1934	21,927.00
22,000	Savannah, City of, Drainage Systems	4½%	1935	23,030.00
23,000	Savannah, City of, Drainage Systems	4½%	1936	24,134.00
24,000	Savannah, City of, Drainage Systems	4½%	1937	25,241.00
10,000	Savannah, City of, Drainage Systems	4½%	1940	10,583.00
50,000	Toronto, City of, P. of Q., Gen. Loan	5%	1932	50,000.00
23,000	Toronto, City of, Consolidated Loan	6%	1944	.....
18,000	Toronto, City of, Consolidated Loan	6%	1945	.....
9,000	Toronto, City of, Consolidated Loan	6%	1946	.....
2,700	United States of A., 1st Liberty Loan	3½%	1947	2,300.00
3,700	United States of A., 1st Liberty Loan	4¼%	1947	2,850.00
92,050	United States of A., 2d Liberty Loan	4¼%	1942	90,900.00
414,800	United States of A., 3d Liberty Loan	4¼%	1928	413,950.00
68,050	United States of A., 4th Liberty Loan	4¼%	1938	66,450.00
94,150	United States of A., 5th Victory Loan	4¾%	1923	93,950.00
1,000	United States of A. War Sav. Stamps		1923	1,000.00
1,000	Westerly, Town of, R. I., Refunding	4%	1929	.....
1,000	Winchester, Town of, Concrete Bridges	4%	1923	2,000.00
1,000	Winchester, Town of, Sewer Const.	4%	1923	2,000.00
40,000	Winnipeg, City of, Man., Debenture	5%	1926	39,350.00
$2,052,700	*Total, Government and Municipal Bonds*			$1,983,710.30
	INDUSTRIAL BONDS			
$50,000	Am. Agri. Chem. Co., 1st Ref. Mort.	7½%	1941	$48,500.00
50,000	Am. Tobacco Co., Series E	7%	1923	50,375.00
75,000	Am. Thread Co., 1st Mtge., 10 Yr.	6%	1928	73,500.00

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest etc.*	*Income Received*
.....	.....	$39,003.30	.....	$1,845.00
.....	$58.00	51,402.00	.....	2,000.00
.....	34.00	50,762.00	.....	2,250.00
.....	128.00	51,669.00	.....	2,125.00
.....	1,000.00	3,000.00	.....	160.00
.....	.....	5,000.00	.....	200.00
.....	1,000.00	5,000.00	.....	220.00
.....	.....	5,000.00	.....	200.00
.....	18.15	6,200.40	.....	270.00
.....	102.85	35,135.60	.....	1,530.00
.....	69.00	15,965.00	.....	750.00
.....	44.00	10,706.00	.....	500.00
.....	90.00	21,837.00	.....	945.00
.....	91.00	22,939.00	.....	990.00
.....	92.00	24,042.00	.....	1,035.00
.....	94.00	25,147.00	.....	1,080.00
.....	36.00	10,547.00	.....	450.00
.....	.....	50,000.00	.....	2,500.00
$24,469.70	67.00	24,402.70	$156.00	.....
19,175.40	51.00	19,124.40	199.33	.....
9,599.40	25.00	9,574.40	78.00	.....
400.00	.....	2,700.00	.....	87.50
850.00	.....	3,700.00	.....	156.83
1,150.00	.....	92,050.00	.....	3,905.76
850.00	.....	414,800.00	.....	17,616.26
1,600.00	.....	68,050.00	.....	2,873.02
200.00	.....	94,150.00	.....	4,472.13
.....	.....	1,000.00	.....	.....
1,000.00	.....	1,000.00	.....	20.00
.....	1,000.00	1,000.00	.....	80.00
.....	1,000.00	1,000.00	.....	80.00
.....	.....	39,350.00	.....	2,000.00
$117,982.00	$8,139.00	$2,093,553.30	$1,229.49	$87,190.25
.....	.....	$48,500.00	.....	$3,750.00
.....	$375.00	50,000.00	.....	3,500.00
.....	.....	73,500.00	.....	4,500.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1921*
	INDUSTRIAL BONDS (*Continued*)			
$50,000	Armour & Company, Real Estate	4½%	1939	.....
144,000	Gen. Elec. Co., 20-Yr. Gold Deb.	6%	1940	$105,840.00
63,000	Gen. Elec. Co. Debenture	5%	1952	64,890.00
5,000	Mattagami Pulp & Paper Co., Ltd.	6%	1937	4,000.00
25,000	Swift & Co., 1st Sinking Fund	5%	1944	22,625.00
50,000	Union Twist Drill Co., 1st Mtge.	7%	1932	.....
119,000	U. S. Steel Corp., 10–60 Yr. Sink. Fd.	5%	1963	98,550.00
25,000	Western Electric Co., 1st Mtge.	5%	1922	24,875.00
$656,000	*Total, Industrial Bonds*			$493,155.00

Par Value	INDUSTRIAL STOCKS		*Shares*	
$5,000	American Sugar Refining Co. Pref.	7%	50	$5,900.00
33,000	Amoskeag Mfg. Co. Pref.	4%	330	27,471.50
34,200	Amoskeag Mfg. Co., Common	6%	342	25,285.50
2,500	Copper Range Company Capital	4%	100	6,700.00
60,000	Corning Glass Works Pref.	8%	600	59,124.58
50,000	Eastern Mfg., Pref.	7%	500	49,000.00
3,700	Fulton Iron Works, Common	4%	37	3,034.00
31,200	General Electric Company, Capital	13%	312	41,385.00
7,200	Goodyear Tire & Rubber Co., Pr. Pref.		72	.....
10,000	Goodyear Tire & Rubber Co., Pref.		100	10,000.00
8,400	Hamilton Woolen Company, Capital	6%	84	8,137.92
2,875	Lake Copper Company, Capital		115	1,610.00
8,300	Lancaster Mills, Capital	10%	83	9,642.64
7,800	Lincoln Mfg. Company, Capital	8%	78	7,800.00
50,000	Nashua Mfg. Company, Common		500	27,911.51
50,000	Norton Company Cumulative Pref.	7%	500	50,000.00
7,700	Pepperell Mfg. Co., Common	8%	77	6,845.50
6,300	Plymouth Cordage Company	10%	63	11,970.00
19,700	Pullman Company, Capital	8%	197	31,520.00
75	Pure Oil Company, Common	8%	3	.....
*5,000	Samson Cordage Company	8%	75	5,000.00
50,000	Sanford Mills, Preferred	7%	500	50,000.00
160,000	United Fruit Company, Capital	8%	1,600	127,362.50
50,000	U. S. Steel Corp., Cum. Pref.	7%	500	55,162.50
25,000	U. S. Worsted Company, 1st Pref.	7%	250	25,000.00
1,000	Utah Consolidated Mining Co.		200	2,800.00
5,000	Westinghouse Elec. & Mfg. Co., Pref.	8%	100	6,393.90

*No par value.

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest, etc.*	*Income Received*
$41,431.25	.....	$41,431.25	$852.77	$2,250.00
33,359.25	.....	139,199.25	453.33	7,680.00
.....	$63.00	64,827.00	.....	3,150.00
.....	.....	4,000.00	.....	.....
.....	.....	22,625.00	.....	1,250.00
48,875.00	.....	48,875.00	252.78	.....
27,593.50	4,467.00	121,676.50	668.61	6,150.00
.....	.....	24,875.00	.....	1,250.00
$151,259.00	$4,905.00	$639,509.00	$2,227.49	$33,480.00
.....	.....	$5,900.00	.....	$350.00
.....	.....	27,471.50	.....	1,485.00
.....	.....	25,285.50	.....	2,052.00
.....	.....	6,700.00	.....	100.00
.....	.....	59,124.58	.....	4,800.00
.....	.....	49,000.00	.....	3,500.00
.....	.....	3,034.00	.....	148.00
$1,420.50	.....	42,805.50	.....	3,884.91
5,764.12	$4.12	5,760.00	.....	.....
.....	.....	10,000.00	.....	.....
.....	.....	8,137.92	.....	504.00
.....	.....	1,610.00	.....	.....
.....	.....	9,642.64	.....	830.00
.....	.....	7,800.00	.....	624.00
.....	.....	27,911.51	.....	.....
.....	.....	50,000.00	.....	3,500.00
.....	.....	6,845.50	.....	616.00
.....	.....	11,970.00	.....	787.50
.....	.....	31,520.00	.....	1,576.00
75.00	.....	75.00	.....	6.00
.....	.....	5,000.00	.....	600.00
.....	.....	50,000.00	.....	3,500.00
.....	.....	127,362.50	.....	12,800.00
.....	.....	55,162.50	.....	3,500.00
.....	.....	25,000.00	.....	.....
.....	.....	2,800.00	.....	.....
.....	.....	6,393.90	.....	400.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Shares*	*Balance June 30, 1921*
	INDUSTRIAL STOCKS (*Continued*)			
$9,400	Westinghouse Elec. & Mfg. Co., Com.	8%	188	$9,106.54
50,000	Winnsboro Mills, Preferred	7%	500	51,000.00
2,500	Winona Copper Company, Capital . . .		100	611.99
$755,850	*Total, Industrial Stocks*			$715,775.58

Par Value	PUBLIC UTILITY BONDS		*Maturity*	
$115,000	Am. Tel. & Tel. Co., Col. Trust . .	4%	1929	$114,025.00
3,000	Am. Tel. & Tel. Co., Col. Trust . . .	5%	1946	.....
500	Beaumont Gas Lt. Co., 1st Mtge. Gold	5%	1944	500.00
50,000	Blackstone Valley Gas & El. Co. Mtge	5%	1939	50,184.00
1,000	Boston Elevated Railway Co. Deb. .	4½%	1941	.....
70,000	Brooklyn Rapid Tr. Co. Ctf. of Dep.	7%	1921	70,000.00
30,000	Cedar Rapids Mfg. & P. Co., 1st Mtge.	5%	1953	.....
25,000	Chesapeake & Potomac Tel. Co. S. F.	5%	1943	24,500.00
50,000	Chicago City Railway Co., 1st Mtge.	5%	1927	49,750.00
100,000	Cleveland Elec. Ill. Co., 1st Mtge. .	5%	1939	101,630.00
20,000	Commonwealth Edison Co., Col. Gold	7%	1925	20,000.00
50,000	Commonwealth Electric Co., 1st Mtge.	5%	1943	.....
50,000	Connecticut Lt. & Power Co., Mtge.	7%	1951	47,250.00
25,000	Consolidation Coal Co., 1st Mtge. . .	5%	1950	.....
68,000	Con. Gas, Elec. Lt. & Power Co., Mtge.	4½%	1935	63,630.00
50,000	Consumers Power Co. 1st L. & Ref. .	5%	1936	50,000.00
100	Continental Gas & Elec. Corp. . . .	5%	1927	100.00
51,000	Cumberland Tel. & Tel. Co., Mtge. .	5%	1937	50,305.75
25,000	Detroit Edison Co., 1st Mtge. . . .	5%	1933	25,370.00
50,000	Detroit Edison Co., 1st & Ref. Mtge.	5%	1940	50,100.00
30,000	Duquesne Light Co. 1st Mtge. . . .	6%	1949	.....
125,000	Edison Elec. Ill. Co., 3 Year Notes .	5½%	1925	.....
1,850	East. Mass. St. Ry. Co., Ref. Mtge. .	6%	1948	1,750.00
35,000	East. Mass. St. Ry. Co., Ref. Mtge.	4½%	1948	35,000.00
17,000	Elec. Securities Corp. Col. Tr. S. F. .	5%	1940	16,830.00
1,000	Elec. Securities Corp. Col. Tr. S. F. .	5%	1942	990.00
25,000	Elec. Securities Corp. Col. Tr. S. F. .	5%	1943	25,000.00
25,000	Em. Gas & El. Co. & Em. Coke Co. Jt.	5%	1941	18,250.00
5,000	Empire Gas & Fuel Co. 1st Mtge. . .	6%	1926	4,475.00
47,000	Georgia Ry. & El. Co., 1st Cons. Mt.	5%	1932	47,710.00
1,000	Georgia & Southern Utilities Co. . .	8%	1922	1,000.00
100	Georgia & South. Utilities, 1st Mtge.	6%	1932	100.00
50,000	Great Lakes Power Co., Ltd., 1st Mtge.	6%	1943	.....

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$9,106.54	.....	$752.00
.....	.....	51,000.00	.....	3,500.00
.....	.....	611.99	.....	.....
$7,259.62	$4.12	$723,031.08	.....	$49,815.41
.....	.....	$114,025.00	.....	$4,600.00
$2,900.00	.....	2,900.00	.....	150.00
.....	.....	500.00	.....	30.00
.....	$11.00	50,173.00	.....	2,500.00
1,000.00	.....	1,000.00	.....	45.00
.....	.....	70,000.00	.....	.....
27,975.00	.....	27,975.00	$208.33	.....
.....	.....	24,500.00	.....	1,250.00
.....	.....	49,750.00	.....	2,500.00
.....	96.00	101,534.00	.....	5,000.00
.....	.....	20,000.00	.....	1,400.00
47,937.50	.....	47,937.50	1,076.39	1,250.00
.....	.....	47,250.00	.....	3,500.00
21,656.25	.....	21,656.25	288.20	625.00
.....	.....	63,630.00	.....	3,060.00
.....	.....	50,000.00	.....	2,500.00
.....	.....	100.00	.....	5.00
.....	.....	50,305.75	.....	2,550.00
.....	34.00	25,336.00	.....	1,250.00
.....	5.00	50,095.00	.....	2,500.00
30,748.75	28.00	30,720.75	281.93	.....
123,937.50	.....	123,937.50	1,515.91	.....
100.00	.....	1,850.00	.....	304.37
.....	.....	35,000.00	.....	1,575.00
.....	.....	16,830.00	.....	850.00
.....	.....	990.00	.....	50.00
.....	.....	25,000.00	.....	1,250.00
.....	.....	18,250.00	.....	1,250.00
.....	.....	4,475.00	.....	300.00
.....	71.00	47,639.00	.....	2,350.00
.....	.....	1,000.00	.....	50.00
.....	.....	100.00	.....	6.00
43,187.50	.....	43,187.50	841.67	3,000.00

Schedule H *(Continued)*

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1921*
	PUBLIC UTILITY BONDS *(Continued)*			
$50,000	Hydraulic Power Co. of Niagara Falls	5%	1951	$42,500.00
7,000	Illinois Gas Co., 1st Mtge. Gold . .	6%	1933	5,460.00
50,000	Interboro Rapid Transit Co. Mtge. .	5%	1966	49,562.50
10,000	Intermountain Ry. Lt. & Power Co. .	8%	1922	10,000.00
2,000	Iowa Falls Electric Co., 1st Mtge. Gold	6%	1922	1,959.00
50,000	Laurentide Power Co., Ltd., 1st Mtge.	5%	1946	5,740.00
100,000	Massachusetts Gas Co., Consolidated	4½%	1931	96,812.50
66,000	Milwaukee Gas Light Co., 1st Mtge.	4%	1927	61,932.50
50,000	Minneapolis Gen. Elec. Co., Mtge. .	5%	1934	50,355.00
25,000	Mississippi River Power Co., 1st Mtge.	5%	1951	18,531.25
50,000	New England Tel. & Tel. Co., Deb. .	5%	1932	50,175.00
50,000	New England Tel. & Tel. Co., Deb. .	4%	1930	50,665.00
55,000	New York Telephone Co., 1st Mtge. .	4½%	1939	53,130.86
25,000	Northwestern Bell Tel. Co., 1st Mtge.	7%	1941	24,151.88
75,000	Pacific Tel. & Tel. Co., 1st Mtge. . .	5%	1937	73,915.10
25,000	Portland Gen. Electric Co., 1st Mtge.	5%	1935	25,355.00
50,000	Salmon River Power Co., 1st Mtge. .	5%	1952	.....
19,000	Seattle Electric Co., Cons. Mtge. . .	5%	1929	18,430.00
50,000	Shawinigan Water & Power Co., Mtge.	6%	1950	.....
100,000	Southern Bell Tel. & Tel. Co., Mtge.	5%	1941	101,137.00
45,000	Southern Calif. Edison Co., Mtge. . .	5%	1939	44,550.00
5,000	Southern Utilities Co., 1st Mtge. S. F.	6%	1933	3,900.00
25,000	Terre Haute Tract. & Light Co., Mtge.	5%	1944	25,000.00
100,000	Turner's Falls Power & Elec. Co. . .	7%	1925	100,000.00
8,000	United Gas & Elec. Corp., Col. Tr. .	6%	1945	4,240.00
75,000	Western Tel. & Tel. Co., Col. Tr. . .	5%	1932	75,700.00
$2,363,550	*Total, Public Utility Bonds* . . .			$1,861,652.34

Par Value	PUBLIC UTILITY STOCKS		*Shares*	
$20,000	American Tel. & Tel. Co., Capital . .	9%	200	$9,216.05
19,800	Boston Elevated Ry. Co., Common . .	5½%	198	16,636.00
15,500	Cambridge Gas Light Co., Capital . .	13%	155	34,875.00
5,000	Mass. Gas Companies, Preferred . . .	4%	50	4,100.00
3,600	New England Tel. & Tel. Co., Capital.	7%	36	4,682.97
8,600	Salem Gas Light Co., Common . . .	8%	86	17,200.00
200	West End Street Ry. Co., Preferred .	8%	4	1,125.00
*3,000	Western Power Corp., Common . . .	...	100	.....
$75,700	*Total, Public Utility Stocks*			$87,835.02

*No par value.

Schedule H *(Continued)*

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$42,500.00	.....	$2,500.00
.....	.....	5,460.00	.....	.....
.....	.....	49,562.50	.....	2,500.00
.....	.....	10,000.00	.....	800.00
.....	.....	1,959.00	.....	120.00
$39,990.00	.....	45,730.00	$298.61	350.00
.....	.....	96,812.50	.....	4,500.00
.....	.....	61,932.50	.....	2,640.00
.....	$30.00	50,325.00	.....	2,500.00
.....	.....	18,531.25	.....	1,250.00
.....	21.00	50,154.00	.....	2,000.00
.....	66.00	50,599.00	.....	2,500.00
.....	.....	53,130.86	.....	2,475.00
.....	.....	24,151.88	.....	1,750.00
.....	.....	73,915.10	.....	3,750.00
.....	27.00	25,328.00	.....	1,250.00
47,625.00	.....	47,625.00	795.14	.....
.....	.....	18,430.00	.....	950.00
51,190.00	43.00	51,147.00	519.66	.....
.....	60.00	101,077.00	.....	5,000.00
.....	.....	44,550.00	.....	2,250.00
.....	.....	3,900.00	.....	300.00
.....	.....	25,000.00	.....	1,250.00
.....	.....	100,000.00	.....	7,000.00
.....	.....	4,240.00	.....	480.00
.....	70.00	75,630.00	.....	3,750.00
$438,247.50	$562.00	$2,299,337.84	$5,825.84	$97,565.37
$13,669.76	.....	$22,885.81	.....	$1,107.00
.....	.....	16,636.00	.....	1,089.00
.....	.....	34,875.00	.....	2,170.00
.....	.....	4,100.00	.....	200.00
.....	.....	4,682.97	.....	288.00
.....	.....	17,200.00	.....	688.00
180.00	$1,125.00	180.00	.....	68.00
3,000.00	.....	3,000.00	.....	.....
$16,849.76	$1,125.00	$103,559.78	.....	$5,610.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1921*
	RAILROAD BONDS			
$75,000	Atch., Top. & S. F., Cal. & Ariz. Lines	4½%	1962	$73,143.75
75,000	Atch., Top. & Santa Fe Gen. Mtge.	4%	1995	72,000.00
54,000	Baltimore & Ohio R.R. Co. S.W. Div.	3½%	1925	48,890.00
40,000	Balt. & Ohio Co., S.W. Div. Reg.	3½%	1925	37,600.00
2,000	Campbell's Creek R.R. Co., 1st Mtge.	5%	1924	2,000.00
50,000	Cen. Pacific Ry. Co., Short Line Mtge.	4%	1954	40,918.75
93,000	Chesapeake & Ohio Ry. Co. Mtge.	5%	1939	98,887.00
48,000	Chicago, Burlington & Quincy Mtge.	4%	1958	47,307.00
50,000	Chicago Junc. Rys. & Un. St. Yards	4%	1940	49,250.00
35,000	Chicago Junc. Rys. & Un. St. Yards	5%	1940	34,743.75
55,000	Chic., Mil. & St. Paul Conv. Mtge.	5%	2014	56,054.00
25,000	Chic., Milwaukee & St. Paul R.R. Deb.	4%	1934	23,406.25
100,000	Chicago & No'western Ry. Co., Mtge.	4%	1987	96,500.00
65,000	Chicago Union Station, 1st Mtge.	4½%	1963	65,437.00
25,000	Cleveland & Pittsburg R.R. Co. Mtge.	4½%	1942	25,594.00
100,000	Delaware & Hudson Co., 20-Yr. Con.	5%	1935	104,817.00
17,000	Delaware & Hudson Co., 1st Mtge.	4%	1943	17,210.00
75,000	Illinois Central R.R. Co., Sec. Gold	4%	1952	67,875.00
59,000	Ill. Cen. R.R. Co., West. Lines Mtge.	4%	1951	54,526.25
9,000	Ill. Cen. R.R. Co., West. Lines Mtge.	4%	1951	8,291.25
25,000	Indianapolis Un. Ry. Co., Gen. Mtge.	5%	1965	24,906.25
7,000	Kan. City, Clinton & Springfield Co.	5%	1925	6,289.21
8,500	Kan. City, Mem. & Birm. Co., Mtge.	4%	1934	8,287.50
37,000	Kan. City, Mem. & Birm. Co. In. Mtge.	5%	1934	34,225.00
50,000	Kan. City, Ft. Scott & Mem. Co. Mtge.	6%	1928	52,181.00
50,000	Kansas City Terminal Co., 1st Mtge.	4%	1960	44,187.50
18,000	Kentucky Central Railway Co. Mtge.	4%	1987	17,910.00
85,000	Lake Shore & Michigan South. Co.	4%	1931	84,087.50
50,000	Long Island R.R. Co., Unified Mtge.	4%	1949	48,068.75
50,000	Long Island R.R. Co., Un. Mtge. Reg.	4%	1949	48,068.75
75,000	Maine Central R.R. Co., 1st Mtge.	4½%	1935	75,068.00
100,000	Minn., St. Paul & S. St. Marie Ry.Co.	4%	1938	93,425.00
21,000	Miss. & Ill. Bridge & Belt Co. Mtge.	4%	1951	13,650.00
14,000	New York Central R.R. Co. Conv.	6%	1935	12,180.00
52,000	New York Cen. R.R. Co., Cons. Mtge.	4%	1998	46,046.65
100,000	New York Connect. R.R., 1st Mtge.	4½%	1953	98,625.00
31,200	N. Y., N. H. & Hart. Co., Con. Deb.	6%	1948	34,290.00
100,000	No. Pac., Gt. No. Chic., Bur. & Q. Jt.	6½%	1936	96,500.00
75,000	No. Pacific R.R. Co., Prior Lien Ry.	4%	1997	67,875.00

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest etc.*	*Income Received*
.....	.....	$73,143.75	.....	$3,375.00
.....	.....	72,000.00	.....	3,000.00
.....	.....	48,890.00	.....	1,890.00
.....	.....	37,600.00	.....	1,400.00
.....	.....	2,000.00	.....	100.00
.....	.....	40,918.75	.....	2,000.00
.....	$347.00	98,540.00	.....	4,650.00
.....	.....	47,307.00	.....	1,920.00
.....	.....	49,250.00	.....	2,000.00
.....	.....	34,743.75	.....	1,750.00
.....	11.00	56,043.00	.....	2,750.00
.....	.....	23,406.25	.....	1,000.00
.....	.....	96,500.00	.....	4,000.00
.....	10.00	65,427.00	.....	2,925.00
.....	30.00	25,564.00	.....	1,125.00
.....	370.00	104,447.00	.....	5,000.00
.....	10.00	17,200.00	.....	680.00
.....	.....	67,875.00	.....	3,000.00
.....	.....	54,526.25	.....	2,360.00
.....	.....	8,291.25	.....	360.00
.....	.....	24,906.25	.....	1,250.00
.....	.....	6,289.31	.....	350.00
.....	.....	8,287.50	.....	340.00
.....	.....	34,225.00	.....	1,850.00
.....	364.00	51,817.00	.....	3,000.00
.....	.....	44,187.50	.....	2,000.00
.....	.....	17,910.00	.....	720.00
.....	.....	84,087.50	.....	3,400.00
.....	.....	48,068.75	.....	2,000.00
.....	.....	48,068.75	.....	2,000.00
.....	5.00	75,063.00	.....	3,375.00
.....	.....	93,425.00	.....	4,000.00
.....	.....	13,650.00	.....	840.00
.....	.....	12,180.00	.....	840.00
.....	.....	46,046.65	.....	2,080.00
.....	.....	98,625.00	.....	4,500.00
.....	119.00	34,171.00	.....	1,872.00
.....	.....	96,500.00	.....	3,270.00
.....	.....	67,875.00	.....	3,000.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1921*
	RAILROAD BONDS (*Continued*)			
$84,000	Oregon R.R. & Nav. Co., Cons. Mtge.	4%	1946	$82,668.25
50,000	Oregon Short Line R.R. Co., Ref.	4%	1929	48,500.00
14,500	Oregon Short Line R.R. Cons. Mtge.	5%	1946	15,211.00
18,000	Pennsylvania R.R. Co., Cons. Mtge.	4½%	1960	18,570.00
100,000	Penn. R.R. Co., Gen. Mtge.	4½%	1965	101,006.00
117,900	Pere Marquette Ry., 1st Mtge.	5%	1956	104,719.59
51,000	Rio Grande Western Ry. Co. Mtge.	4%	1939	49,935.00
16,000	St. Louis & San Fran. R.R. Co. Pr. Lien	4%	1950	9,600.00
32,000	St. Louis & San Fran. R.R. Co. Pr. Lien	5%	1950	32,000.00
16,000	St. Louis & San Fran. Adj. Mtge.	6%	1955	16,000.00
1,000	Somerset Ry. Co., 1st & Ref. Mtge.	4%	1955	850.00
25,000	So. Ry. Co., St. Louis Div., 1st Mtge.	4%	1951	24,875.00
100,000	Term. R.R. Asso. of St. Louis, Mtge.	4½%	1939	100,290.00
100	Toledo Term. R.R. Co., 1st Mtge.	4½%	1957	75.00
100,000	Un. Pac. R.R. Co., 1st Mtge. & L. Gr.	4%	1947	100,948.00
1,000	Washington Co. Ry. Co., 1st Mtge.	3½%	1954	750.00
10,000	Western Pacific R.R. Co., 1st Mtge.	5%	1946	8,000.00
50,000	Winston Salem South. Ry. Co., Mtge.	4%	1960	43,875.00
$2,787,200	*Total, Railroad Bonds*			$2,688,194.95

Par Value	RAILROAD STOCKS	*Shares*	
$33,600	Atchison, Topeka & Santa Fe Co. Pref. 5%	336	$25,200.00
60,800	Atchison, Topeka & Santa Fe Co. Com. 6%	608	51,680.00
34,000	Boston & Albany R.R. Co., Capital 9%	340	68,921.50
19,200	B. & M. Co., Class A, 1st Pref.	192	14,699.00
3,200	Delaware & Hudson R.R. Co., Cap. 9%	32	3,104.00
500	Great Northern Ry. Co., Preferred 7%	5	.....
10,100	Maine Central R.R. Co., Capital	101	9,740.00
17,600	Minn., St. Paul & S. St. Marie Co. Pref. 4%	176	9,680.00
6,500	New York Central R.R. Co., Capital 5%	65	5,760.63
8,800	Old Colony R.R. Co., Capital 7%	88	12,050.00
14,400	Pere Marquette Ry. Co., Pr. Pref. 5%	144	8,640.00
10,000	Union Pacific R.R. Common 10%	100	12,235.00
22,400	Wisconsin Central Ry. Co., Common	224	7,168.00
$241,100	*Total, Railroad Stocks*		$228,878.13

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest etc.*	*Income Received*
.....	.....	$82,668.25	.....	$3,360.00
.....	.....	48,500.00	.....	2,000.00
.....	$30.00	15,181.00	.....	725.00
.....	15.00	18,555.00	.....	810.00
.....	23.00	100,983.00	.....	4,500.00
.....	.....	104,719.59	.....	5,895.00
.....	.....	49,935.00	.....	2,040.00
.....	.....	9,600.00	.....	640.00
.....	.....	32,000.00	.....	1,600.00
.....	.....	16,000.00	.....	960.00
.....	.....	850.00	.....	40.00
.....	.....	24,875.00	.....	1,000.00
.....	17.00	100,273.00	.....	4,500.00
.....	.....	75.00	.....	4.50
.....	38.00	100,910.00	.....	4,000.00
.....	.....	750.00	.....	35.00
.....	.....	8,000.00	.....	500.00
.....	.....	43,875.00	.....	2,000.00
.....	$1,389.00	$2,686,805.95	.....	$120,581.50
.....	.....	$25,200.00	.....	$1,680.00
.....	.....	51,680.00	.....	3,648.00
.....	.....	68,921.50	.....	2,975.00
.....	.....	14,699.00	.....	.....
.....	.....	3,104.00	.....	504.00
$355.00	.....	355.00	.....	17.50
.....	.....	9,740.00	.....	.....
.....	.....	9,680.00	.....	704.00
.....	.....	5,760.63	.....	325.00
.....	.....	12,050.00	.....	616.00
.....	.....	8,640.00	.....	720.00
.....	.....	12,235.00	.....	1,000.00
.....	.....	7,168.00	.....	.....
$355.00	.....	$229,233.13	.....	$12,189.50

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1921*
	REAL ESTATE BONDS			
$2,500	Ellicott Sq. Co. of Buffalo, N. Y., Mtge.	5%	1935	.....
499,000	Equit. Office Build. Corp., 35-Yr. Deb.	5%	1952	.....
1,000	Quincy Market Real. Co. Tr., 1st Mtge.	5%	1964	$1,000.00
400	Technology Club of New York W. F.	5%	....	200.00
98,000	Trinity Building Corp. of N. Y. Mtge.	5½%	1939	47,250.00
$600,900	*Total, Real Estate Bonds*			$48,450.00
	REAL ESTATE STOCKS		*Shares*	
$58,800	Alaska Building Trust	2½%	588	$58,800.00
68,000	Boston Real Estate Trust Capital . .	5%	68	71,661.64
$126,800	*Total, Real Estate Stocks*			$130,461.64
	MISCELLANEOUS STOCKS			
$10,000	Beacon Trust Company, Capital .	15%	100	$25,000.00
2,500	Federal Trust Company, Capital . .	6%	25	3,450.00
300	Nat. Grand Bank of Marblehead, Cap.	8%	3	324.00
$12,800	*Total, Miscellaneous Stocks*			$28,774.00
	Miscellaneous Stocks and Bonds Sold during Year			$432,128.03
	MORTGAGE NOTES		*Maturity*	
$35,500	William H. Agry, Trustee	6%	1923	.....
4,500	E. V. and C. T. Bigelow	5%	1923	$4,500.00
30,000	Cambridge Tobacco Co.	6%	1924	30,000.00
75,000	Samuel Carr *et al.*, Trustees	6%	....	75,000.00
75,000	Harry A. Henderson	6½%	1924	75,000.00
50,000	Chester J. O'Brien	6½%	....	50,000.00
250,000	The Park Sq. Real Estate Trust . .	6½%	1924	250,000.00
7,000	W. H. Partridge	5%	....	7,000.00
25,000	W. J. Stober	6%	1922	.....
30,000	W. J. Stober	5%	1925	.....
32,000	W. H. Agry, Trustee	6%	1923	.....
50,000	Edward F. Kakas & Sons Inc. . . .	6½%	1924	.....
44,000	F. J. Holderreid (2)	6%	1927	.....
$708,000	*Total, Mortgage Notes*			$491,500.00
	Mortgage Notes Sold during Year			$165,500.00
	REAL ESTATE			
$75,732.55	Avon Street Land and Building, Equity		....	$75,732.55
135,364.53	Franklin St. Land and Build., Equity .		....	135,364.53
34,100.00	Huntington Ave. Land and Building		....	34,100.00
3,000.00	Nashua, N. H., Land and Building .		....	.....
200.00	Dorchester Land and Building . . .		....	200.00
$248,397.08	*Total, Real Estate*			$245,397.08
	Real Estate Sold during Year			$122,003.35

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest, etc.*	*Income Received*
$2,500.00	.....	$2,500.00	.....	$125.00
500,000.00	$1,000.00	499,000.00	.....	1,175.00
.....	.....	1,000.00	.....	50.00
200.00	.....	400.00	.....	20.00
47,500.00	.....	94,750.00	$1,177.92	5,390.00
$550,200.00	$1,000.00	$597,650.00	$1,177.92	$6,760.00
.....	$548.78	$58,251.22	.....	$921.22
.....	.....	71,661.64	.....	3,400.00
.....	$548.78	$129,912.86	.....	$4,321.22
.....	$4,198.64	$20,801.36	.....	$1,875.00
.....	.....	3,450.00	.....	150.00
.....	.....	324.00	.....	24.00
.....	$4,198.64	$24,575.36	.....	$2,049.00
$9,708.17	$441,836.20	.....	.....	$19,463.43
$35,500.00	.....	$35,500.00	.....	.....
.....	.....	4,500.00	.....	$225.00
.....	.....	30,000.00	.....	1,800.00
.....	.....	75,000.00	.....	4,500.00
.....	.....	75,000.00	.....	4,875.00
.....	.....	50,000.00	.....	3,250.00
.....	.....	250,000.00	.....	10,000.00
.....	.....	7,000.00	.....	350.75
25,000.00	.....	25,000.00	.....	750.00
30,000.00	.....	30,000.00	.....	.....
32,000.00	.....	32,000.00	.....	.....
50,000.00	.....	50,000.00	.....	1,625.00
44,000.00	.....	44,000.00	.....	.....
$216,500.00	.....	$708,000.00	.....	$27,375.75
$27,000.00	$192,500.00	.....	.....	$9,291.00
.....	.....	$75,732.55	$7,992.25	$9,086.36
.....	.....	135,364.53	16,974.58	17,075.55
.....	.....	34,100.00	2,276.06	2,433.40
$3,000.00	.....	3,000.00	431.74	143.82
.....	.....	200.00	160.61	.....
$3,000.00	.....	$248,397.08	$27,835.24	$28,739.13
$121,330.88	$243,334.23	.....	$5,436.36	$8,402.80

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Percent of Total 1922*	*Percent of Total 1921*	*Balance June 30, 1921*
	Recapitulation, General Investments			
$2,052,700.00	Government and Municipal Bonds	20.00	21.32	$1,983,710.30
656,000.00	Industrial Bonds	6.10	5.06	493,155.00
755,850.00	Industrial Stocks	6.91	8.30	715,775.58
2,363,550.00	Public Utility Bonds	21.90	21.45	1,861,652.34
75,700.00	Public Utility Stocks	.99	.91	87,835.02
2,787,200.00	Railroad Bonds	25.60	27.64	2,688,194.95
241,100.00	Railroad Stocks	2.19	2.62	228,878.13
600,900.00	Real Estate Bonds	5.71	.50	48,450.00
126,800.00	Real Estate Stocks	1.24	1.34	130,461.64
12,800.00	Miscellaneous Stocks	.23	.32	28,774.00
708,000.00	Mortgage Notes	6.47	6.76	491,500.00
248,397.08	Real Estate	2.66	3.78	245,397.08
.....	Investments Sold during Year	....	....	719,631.38
$10,628,997.08	*Total, General Investments*	100.00	100.00	$9,723,415.42

Par Value	**Investments, Malcolm Cotton Brown Fund**			
$15,000	Metro. West Side Elev. Ry. Co., Mtge.	4%	1938	$6,750.00
10,000	Metro. West Side Elev. Ry. Co., Mtge.	4%	1938	4,100.00
$25,000	*Total*			$10,850.00

	Investments, Frank Harvey Cilley Fund			
$10,000	New York, City of, Corp. Stock	4¼%	1964	$10,410.00
5,000	Cedar Rapids Mfg. & Power Co. Mtge.	5%	1953	4,075.00
8,000	Elec. Securities Corp., Col. Tr. S. F.	5%	1940	7,960.00
5,000	St. Louis Iron Mt. & So. R.R., Mtge.	4%	1933	4,812.50
			Shares	
3,000	Edison Electric Ill. Co., Capital	12%	30	7,959.00
7,500	Mass. Gas Companies Pref.	4%	75	6,825.00
1,250	Springfield Ry. Com. Pref.	8%	25	2,125.00
2,500	West End Street Ry. Co., Common	7%	50	3,600.00
4,000	Boston & Albany R.R. Co., Capital	9%	40	8,000.00
5,000	B. & M. R.R. Co., Class A, 1st Pref.	——	50	5,000.00
1,000	Boston & Providence R.R. Corp.	10%	10	2,500.00
5,000	N. Y., N. H. & H. R.R., Capital	——	50	4,700.00
*1	South American Properties	——	....	1.00
1,600	Mortgage Note, Isabella Aznive	6%	....	1,600.00
2,400	Mortgage Note, E. and A. Orlogski	5%	....	2,400.00
$61,251	*Total*			$71,967.50

Book Value

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest, etc.*	*Income Received*
$117,982.00	$8,139.00	$2,093,553.30	$1,229.49	$87,190.25
151,259.00	4,905.00	639,509.00	2,227.49	33,480.00
7,259.62	4.12	723,031.08	.....	49,815.41
438,247.50	562.00	2,299,337.84	5,825.84	97,565.37
16,849.76	1,125.00	103,559.78	.....	5,610.00
.....	1,389.00	2,686,805.95	.....	120,581.50
355.00	.....	229,233.13	.....	12,189.50
550,200.00	1,000.00	597,650.00	1,177.92	6,760.00
.....	548.78	129,912.86	.....	4,321.22
.....	4,198.64	24,575.36	.....	2,049.00
216,500.00	.....	708,000.00	.....	27,375.75
3,000.00	.....	248,397.08	27,835.24	28,739.13
158,039.05	877,670.43	.....	5,436.36	37,157.23
$1,659,691.93	$899,541.97	$10,483,565.38	$43,732.34	$512,834.36
.....	.....	$6,750.00	.....	$600.00
.....	.....	4,100.00	.....	400.00
.....	.....	$10,850.00	.....	$1,000.00
.....	$10.00	$10,400.00	.....	$425.00
.....	.....	4,075.00	.....	250.00
.....	.....	7,960.00	.....	400.00
.....	.....	4,812.50	.....	200.00
.....	75.26	7,883.74	.....	360.00
.....	.....	6,825.00	.....	300.00
.....	.....	2,125.00	.....	100.00
.....	.....	3,600.00	.....	175.00
.....	.....	8,000.00	.....	350.00
.....	.....	5,000.00	.....	.....
.....	.....	2,500.00	.....	100.00
.....	4,100.00	600.00	.....	.....
.....	.....	1.00	.....	.....
.....	.....	1,600.00	.....	96.00
.....	.....	2,400.00	.....	120.00
.....	$4,185.26	$67,782.24	.....	$2,876.00

SCHEDULE H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1921*
	INVESTMENTS EBEN S. DRAPER FUND			
$16,000	Georgia Ry. & Elec. Co. 1st Mtge.	5%	1932	$16,180.00
20,000	New York Tel. Co., 1st & Gen. Mtge.	4½%	1939	19,395.00
20,000	Wilmington City Elec. Co., 1st Mtge.	5%	1951	19,600.00
20,000	Chicago, Mil. & St. Paul, Conv. Gold	5%	2014	20,372.00
24,000	Indianapolis Un. Ry. Co., Gen. Mtge.	5%	1965	23,880.00
$100,000	*Total*			$99,427.00
Par Value	INVESTMENTS, JOY SCHOLARSHIP FUND			
$5,000	Cedar Rapids Mfg. & Power Co. Mtge.	5%	1953	$4,075.00
5,000	Mass. Hospital Life Insurance Co.	5%	....	5,000.00
$10,000	*Total*			$9,075.00
	INVESTMENTS, M. I. T. EDUCATIONAL ENDOWMENT FUND			
			Shares	
*$4,000,000	Eastman Kodak Co., Common	5%	50,000	$4,000,000.00
Par Value	INVESTMENTS, WILLIAM BARTON ROGERS MEMORIAL FUND			
			Maturity	
$40,000	Cedar Rapids Mfg. & Power Co., Mtge.	5%	1953	$32,600.00
4,000	United Electric Securities Co., S. F.	5%	1940	4,024.00
25,000	Atch., Top. & Santa Fe Co., Mtge.	4%	1995	24,470.00
6,000	Baltimore & Ohio S.W. Div., Mtge.	3½%	1925	5,310.00
7,000	Chesapeake & Ohio Cons., 1st Mtge.	5%	1939	7,543.00
1,000	Chicago, Burlington & Quincy, Mtge.	4%	1958	1,000.00
40,000	Chi. Jt. Rys. & Un. St. Yds. Co., Mtge.	5%	1940	39,400.00
35,000	Fort St. Union Depot Co., 1st Mtge.	4½%	1941	34,825.00
31,000	New York Central & Hudson River	4%	1934	30,225.00
37,500	Pere Marquette Ry. Co., 1st Mtge.	4%	1956	37,500.00
24,000	Rome, Watertown, Ogdensburg Mtge.	5%	1922	24,000.00
$250,500	*Total*			$240,897.00
	INVESTMENTS, RICHARD LEE RUSSEL FELLOWSHIP FUND			
$2,000	Trinity Build. Corp. of N. Y., 1st Mtge.	5½%	1939	$2,000.00
	INVESTMENTS, SUSAN H. SWETT SCHOLARSHIP FUND			
$10,000	Mass. Hospital Life Insurance Co.	5%	....	$10,000.00

*No par value

SCHEDULE H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest, etc.*	*Income Received*
.....	$18.00	$16,162.00	.....	$800.00
.....	.....	19,395.00	.....	900.00
.....	.....	19,600.00	.....	1,000.00
.....	4.00	20,368.00	.....	1,000.00
.....	.....	23,880.00	.....	1,200.00
.....	$22.00	$99,405.00	.....	$4,900.00
.....	.....	$4,075.00	.....	$250.00
.....	.....	5,000.00	.....	250.00
.....	.....	$9,075.00	.....	$500.00
.....	.....	$4,000,000.00	.....	$187,500.00
.....	.....	$32,600.00	.....	$2,000.00
.....	$2.00	4,022.00	.....	200.00
.....	.....	24,470.00	.....	1,000.00
.....	.....	5,310.00	.....	210.00
.....	32.00	7,511.00	.....	350.00
.....	.....	1,000.00	.....	40.00
.....	.....	39,400.00	.....	2,000.00
.....	.....	34,825.00	.....	1,575.00
.....	.....	30,225.00	.....	1,240.00
.....	.....	37,500.00	.....	1,500.00
.....	.....	24,000.00	.....	1,200.00
.....	$34.00	$240,863.00	.....	$11,315.00
.....	.....	$2,000.00	.....	$110.00
.....	.....	$10,000.00	.....	$500.00

SCHEDULE H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1921*
	INVESTMENTS, JONATHAN WHITNEY FUND			
$25,000	Montreal, City of, Canada	5%	1936	$25,000.00
25,000	New York, City of, Corporate Stock	4¼%	1964	26,088.00
25,000	United States of America 3d Lib. Ln.	4¼%	1928	25,000.00
25,000	American Thread Co., 1st Mtge.	6%	1928	26,874.00
25,000	General Electric Co., Gold Deb.	6%	1940	23,625.00
25,000	Swift & Co., 1st Sinking Fund	5%	1944	22,625.00
25,000	Detroit Edison Co., 1st Mtge.	5%	1933	25,329.00
25,000	Georgia Rail. & Elec. Co., 1st Mtge.	5%	1932	25,419.00
25,000	N. Y. Tel. Co., 1st & Gen. Mtge.	4½%	1939	24,150.39
21,000	United Elec. Securities Co., Tr. S. F.	5%	1940	21,074.00
25,000	Western Tel. & Tel. Co., Col. Tr.	5%	1932	25,470.00
25,000	Atch., Top. & S. F., Cal. & Ariz. Lines	4½%	1962	24,381.25
35,000	Chicago Union Station, 1st Mtge.	4½%	1963	35,236.00
25,000	Illinois Cen. R. R. Co., Sec. Gold	4%	1952	22,625.00
25,000	Maine Cen. R.R. Co., 1st & Ref. Mtge.	4½%	1935	25,021.00
150,000	Mortgage Note, M. I. T. Dormitory	5¾%	1924	150,000.00
$531,000	*Total*			$527,917.64
$15,618,748.08	*Grand Total, All Investments, (Schedule D)*			$14,695,549.56

SCHEDULE H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1922*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$25,000.00	.....	$1,250.00
.....	$26.00	26,062.00	.....	1,062.50
.....	.....	25,000.00	.....	1,062.50
.....	313.00	26,561.00	.....	1,500.00
.....	.....	23,625.00	.....	1,500.00
.....	.....	22,625.00	.....	1,250.00
.....	29.00	25,300.00	.....	1,250.00
.....	41.00	25,378.00	.....	1,250.00
.....	.....	24,150.39	.....	1,125.00
.....	4.00	21,070.00	.....	1,050.00
.....	47.00	25,423.00	.....	1,250.00
.....	.....	24,381.25	.....	1,125.00
.....	5.00	35,231.00	.....	1,575.00
.....	.....	22,625.00	.....	1,000.00
.....	2.00	25,019.00	.....	1,125.00
.....	.....	150,000.00	.....	7,798.00
.....	$467.00	$527,450.64	.....	$26,173.00
$1,659,691.93	$904,250.23	$15,450,991.26	$43,732.34	$747,708.36

SCHEDULE J

EDUCATIONAL PLANT

Land, Buildings and Equipment

Land, Boylston, Clarendon and Newbury Streets, Boston	$1,500,000.00
Rogers Building, Boylston Street, Boston	204,534.76
Walker Building, Boylston Street, Boston	150,000.00
Land and Improvements, New Technology, Cambridge	1,119,266.67
Main Educational Building Group, Cambridge	4,071,492.13
Pratt School of Naval Architecture, Cambridge	674,971.70
Mechanic Arts Building, Cambridge	83,658.89
Power Plant (inc. Machinery and Equipment), Cambridge	262,026.08
Educational Equipment, Cambridge	1,806,414.29
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	19,815.14
Summer Camp, East Machias, Maine	102,558.00
Walker Memorial Building, Cambridge	575,111.50
Walker Memorial Building, Equipment	139,475.52
Dormitories, Cambridge, ($331,357.67 less mortgage $150,000)	181,357.67
Dormitories, Equipment	20,707.57
New Service Building, Cambridge	37,837.42
Boat House, Cambridge	15,000.00
New Gas Engine Laboratory, Cambridge	11,000.00
Miscellaneous and Undistributed	271,500.62
Total, June 30, 1922 (Schedule D)	$11,434,460.02

SCHEDULE K

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	169,080.60
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	675,150.00
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 Charles C. Drew Fund	230,000.00
Appropriation of Lucius Tuttle Fund for New Equipment	50,000.00
Appropriation of Frank E. Peabody Fund	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.	1,552,641.75
Total, June 30, 1922 (Schedule D)	$11,423,691.97

SCHEDULE P

ENDOWMENT FUNDS FOR GENERAL PURPOSES

Restricted	*Funds June 30, 1921*	*Investment Income*	*Other Increases*	*Expenditures*	*Funds June 30, 1922*
George Eastman Building Fund	$2,500,000.00	$115,500.00	.....	$115,500.00	$2,500,000.00
Educational Endowment Fund	5,998,253.29	289,833.00	$775,695.50	289,833.00	6,773,948.79
General Endowment Fund	1,527,549.00	70,547.40	.....	70,547.40	1,527,549.00
Anonymous	.....	115.50	5,000.00	115.50	5,000.00
George Robert Armstrong	5,000.00	231.00	.....	231.00	5,000.00
Charles Choate	33,932.63	1,617.00	1,925.52	1,617.00	35,858.15
Eben S. Draper	100,000.00	4,900.00	.....	4,900.00	100,000.00
Martha Ann Edwards	30,000.00	1,386.00	.....	1,386.00	30,000.00
William Endicott	25,000.00	1,155.00	.....	1,155.00	25,000.00
Jonathan French	25,212.48	1,155.00	.....	1,155.00	25,212.48
James Fund	163,654.21	7,576.80	.....	7,576.80	163,654.21
Katharine B. Lowell	5,000.00	231.00	.....	231.00	5,000.00
M. I. T. Alumni Fund	9,210.45	508.20	7,442.87	.....	17,161.52
Richard Perkins	50,000.00	2,310.00	.....	2,310.00	50,000.00
John W. and Belinda L. Randall	83,452.36	3,834.60	.....	3,834.60	83,452.36
William B. Rogers	250,225.00	11,315.00	.....	11,315.00	250,225.00
*Saltonstall Fund	49,988.07	2,310.00	.....	1,732.50	50,565.57
Samuel E. Sawyer	4,764.40	217.14	.....	217.14	4,764.40
Andrew Hastings Spring	.....	1,524.60	50,000.00	1,524.60	50,000.00
Seth K. Sweetser	25,061.62	1,155.00	.....	1,155.00	25,061.62
William J. Walker	23,663.59	1,108.80	.....	1,108.80	23,663.59
Albion K. P. Welch	5,000.00	231.00	.....	231.00	5,000.00
Unrestricted					
Sidney Bartlett	$10,000.00	462.00	.....	462.00	10,000.00
A. F. Bemis	10,000.00	462.00	.....	462.00	10,000.00
Stanton Blake	5,000.00	231.00	.....	231.00	5,000.00
Helen Collamore	12,483.97	554.40	.....	554.40	12,483.97
Charles C. Drew	75,171.52	3,465.00	.....	3,465.00	75,171.52
Maria A. Evans	.....	831.60	61,192.55	831.60	61,192.55
Arthur T. Lyman	5,000.00	231.00	.....	231.00	5,000.00
James McGregor	2,500.00	115.50	.....	115.50	2,500.00
Albert K. Munsell	7,378.24	323.40	.....	323.40	7,378.24
Margaret A. Munsell	1,105.32	46.20	.....	46.20	1,105.32
Nathaniel C. Nash	10,000.00	462.00	.....	462.00	10,000.00
Moses W. Oliver	8,220.49	415.80	3,000.00	415.80	11,220.49
Frank E. Peabody	2,238.89	92.40	.....	92.40	2,238.89
Frances M. Perkins	16,525.00	785.40	.....	785.40	16,525.00
Robert E. Rogers	7,680.77	369.60	.....	369.60	7,680.77
Richard B. Sewall	30,000.00	1,386.00	.....	1,386.00	30,000.00
Horace W. Wadleigh	2,143.14	92.40	.....	92.40	2,143.14
Charles G. Weld	15,000.00	693.00	.....	693.00	15,000.00
Alexander S. Wheeler	30,000.00	1,386.00	.....	1,386.00	30,000.00
	$11,165,414.44	$531,166.74	$904,256.44	$530,081.04	$12,070,756.58

*One-fourth net income added to fund.

SCHEDULE Q
ENDOWMENT FUNDS FOR DESIGNATED PURPOSES

Invested Funds	*Funds June 30, 1921*	*Investment Income*	*Other Increases*	*Expenditures*	*Funds June 30, 1922*
FUNDS FOR SALARIES:					
Samuel C. Cobb For General Salaries . . .	$36,000.00	$1,663.20	.....	$1,663.20	$36,000.00
Sarah H. Forbes For General Salaries . . .	500.00	23.10	.....	23.10	500.00
George A. Gardner For General Salaries . . .	20,000.00	924.00	.....	924.00	20,000.00
James Hayward Professorship of Engineering	18,800.00	868.56	.....	868.56	18,800.00
William P. Mason Professorship of Geology .	18,800.00	868.56	.....	868.56	18,800.00
Henry B. Rogers For General Salaries . . .	25,000.00	1,155.00	.....	1,155.00	25,000.00
Nathaniel Thayer Professorship of Physics .	25,000.00	1,155.00	.....	1,155.00	25,000.00
Totals	$144,100.00	$6,657.42	.....	$6,657.42	$144,100.00
FUNDS FOR LIBRARY, READING ROOMS, AND GYMNASIUM:					
Cilley	$76,930.18	$2,876.00	.....	$6,230.22	$73,575.96
Charles Lewis Flint Library .	5,000.00	231.00	.....	231.00	5,000.00
William Hall Kerr Library .	2,155.57	92.40	.....	80.00	2,167.97
Arthur Rotch Architectural Library	5,000.00	231.00	.....	231.00	5,000.00
John Hume Tod	2,750.80	129.36	.....	168.31	2,711.85
Technology Matrons' Teas	2,094.67	106.26	$4,000.00	94.67	6,106.26
Edna Dow Cheney for Margaret Cheney Reading Room	13,419.82	600.60	700.00	1,450.84	13,269.58
Totals	$107,351.04	$4,266.62	$4,700.00	$8,486.04	$107,831.62
FUNDS FOR DEPARTMENTS:					
George Eastman for Chemistry and Physics	$400,000.00	$18,480.00	.....	$18,480.00	$400,000.00
William P. Atkinson	13,082.20	600.60	.....	600.60	13,082.20
Frank W. Boles Memorial .	17,107.95	739.20	.....	1,844.50	16,002.65
Samuel Cabot (Industrial Chemistry)	66,315.66	3,003.00	.....	2,900.00	66,418.66
Wm. E. Chamberlain. . . .	7,309.77	323.40	.....	323.40	7,309.77
Chem. Eng. Practice	282,772.97	13,074.60	.....	38,074.60	257,772.97
Susan E. Dorr	95,955.67	4,435.20	.....	4,435.20	95,955.67
George H. May Chem. Dept.	5,000.00	231.00	.....	231.00	5,000.00
Pratt Naval Architectural .	456,166.07	20,097.00	.....	80,097.00	396,166.07
Arthur Rotch Architectural	25,000.00	1,155.00	.....	1,155.00	25,000.00
*Edmund K. Turner	212,673.03	9702.00	.....	7,786.50	214,588.53
Totals	$1,581,383.32	$71,841.00	.....	$155,927.80	$1,497,296.52

Schedule Q (*Continued*)

Invested Funds	*Funds June 30, 1921*	*Investment Income*	*Other Increases*	*Expenditures*	*Funds June 30, 1922*
FUNDS FOR RESEARCH :					
Ellen H. Richards Research	$16,625.82	$739.20	.....	$1,155.74	$16,209.28
Charlotte B. Richardson (Industrial Chemistry)	37,378.78	1,709.40	.....	1,709.40	37,378.78
Technology Plan Research	9,121.98	554.40	$4,100.00	972.64	12,803.74
Whitney	45,532.72	2,125.20	.....	.....	47,657.92
Totals	$108,659.30	$5,128.20	$4,100.00	$3,837.78	$114,049.72
FUNDS FOR FELLOWSHIPS:					
Malcolm Cotton Brown	$11,850.00	$1,000.00	.....	$500.00	$12,350.00
Collamore	12,391.08	508.20	.....	1,170.00	11,729.28
Dalton Graduate Chemical	5,784.82	263.34	.....	200.00	5,848.16
du Pont Fellowship	.....	.....	$1,500.00	750.00	750.00
Moore	6,498.67	295.68	.....	250.00	6,544.35
Willard B. Perkins	9,502.20	415.80	.....	1,250.00	8,668.00
Monsanto	*232.00	.....	500.00	318.00	*50.00
Richard L. Russel	2,466.57	110.00	.....	250.00	2,326.57
Henry B. Rogers	10,804.68	739.20	10,057.03	450.00	21,150.91
Henry Saltonstall	10,820.80	462.00	.....	1,166.88	10,115.92
James Savage	13,761.10	462.00	.....	3,794.00	10,429.10
Susan H. Swett	11,020.45	500.00	.....	1,400.00	10,120.45
Totals	$94,668.37	$4,756.22	$12,057.03	$11,498.88	$99,982.74
FUNDS FOR SCHOLARSHIPS:					
Elisha Atkins	$5,383.45	$249.48	.....	$250.00	$5,382.93
Billings Student Fund	52,873.22	2,448.70	.....	2,500.00	52,821.92
Jonathan Bourne	10,613.39	508.20	.....	450.00	10,671.59
Lucius Clapp	5,286.10	244.86	.....	250.00	5,280.96
Lucretia Crocker	61,578.50	2,818.20	.....	390.00	64,006.70
Isaac W. Danforth	5,454.16	249.48	.....	250.00	5,453.64
Ann White Dickinson	43,136.19	1,986.60	.....	2,000.00	43,122.79
Farnsworth Fund	5,437.90	249.48	.....	250.00	5,437.38
Charles Lewis Flint	5,510.15	254.10	.....	250.00	5,514.25
Sarah S. Forbes	3,633.65	166.32	.....	150.00	3,649.97
George Hollingsworth	5,321.00	244.86	.....	250.00	5,315.86
T. Sterry Hunt	3,284.79	152.46	.....	150.00	3,287.25
William F. Huntington	5,463.00	249.48	.....	250.00	5,462.48
Joy Scholarships	10,000.00	500.00	.....	500.00	10,000.00
Income Joy Scholarships	5,184.60	.....	$500.00	300.00	5,384.60
Letter Box Fund	143.46	4.62	.....	.....	148.08
William Litchfield	5,483.64	254.10	.....	250.00	5,487.74
Elisha T. Loring	5,493.43	254.10	.....	250.00	5,497.53
George H. May	5,011.67	231.00	.....	225.00	5,017.67
James H. Mirrlees	3,073.07	138.60	.....	150.00	3,061.67
Nichols Fund	5,437.90	249.48	.....	250.00	5,437.38
Charles C. Nichols	5,483.93	254.10	.....	250.00	5,488.03
John Felt Osgood	5,428.90	249.48	.....	250.00	5,428.38
George L. Parmelee	.....	693.00	17,641.69	.....	18,334.69
Richard Perkins	56,829.70	2,633.40	.....	3,000.00	56,463.10
Thomas Sherwin	5,492.64	254.10	.....	250.00	5,496.74
Susan Upham	1,075.90	46.20	.....	50.00	1,072.10

*Overdraft.

Schedule Q (*Continued*)

Invested Funds	*Funds June 30, 1921*	*Investment Income*	*Other Increases*	*Expenditures*	*Funds June 30, 1922*
Ann White Vose	$65,694.02	$3,049.20	.....	$3,700.00	$65,043.22
Louis Weissbein	4,225.35	184.80	.....	200.00	4,210.15
Frances Erving Weston	1,410.00	64.68	$200.00	180.00	1,494.68
Samuel Martin Weston	200.00	9.24	200.00	200.00	209.24
Totals	$398,643.71	$18,892.32	$18,541.69	$17,395.00	$418,682.72
Funds for Prizes:					
Robert A. Boit	$5,056.80	$231.00	.....	$150.00	$5,137.80
Arthur Rotch Prize Fund in Architecture	5,323.17	244.86	.....	200.00	5,368.03
Arthur Rotch "Special" Prize Fund in Architect.	6,406.11	295.68	.....	200.00	6,501.79
Totals	$16,786.08	$771.54	.....	$550.00	$17,007.62
Funds for Relief:					
Architectural Society	$1,447.25	$64.68	.....	$75.00	$1,436.93
Edward Austin	416,871.59	19,219.20	.....	10,539.38	425,551.41
Thomas Wendall Bailey	2,346.90	110.88	$81.10	125.00	2,413.88
Levi Boles	11,762.98	554.40	.....	600.00	11,717.38
Bursar's Fund	6,008.78	467.60	865.61	746.00	6,595.99
Mabel Blake Case	26,272.36	1,201.20	.....	1,000.00	26,473.56
Dormitory Fund	3,123.72	138.60	.....	.....	3,262.32
Charles Tidd Baker	.....	138.60	20,000.00	.....	20,138.60
Norman H. George	75,130.24	3,465.00	.....	3,500.00	75,095.24
Teachers' Fund	121,634.97	5,359.20	.....	11,639.86	115,354.31
Jonathan Whitney	542,689.70	26,173.00	.....	17,698.22	551,164.48
Morrill Wyman	77,981.57	3,603.60	.....	3,500.00	78,085.17
Totals	$1,285,270.06	$60,495.96	$20,946.71	$49,423.46	$1,317,289.27
Recapitulation					
Funds for General Purposes	$11,165,414.44	$531,166.74	$904,256.44	$530,081.04	$12,070,756.58
Funds for Salaries	144,100.00	6,657.42	.....	6,657.42	144,100.00
Funds for Libraries, Reading Rooms and Gymnasiums	107,351.04	4,266.62	4,700.00	8,486.04	107,831.62
Funds for Departments	1,581,383.32	71,841.00	.....	155,927.80	1,497,296.52
Funds for Research	108,659.30	5,128.20	4,100.00	3,837.78	114,049.72
Funds for Fellowships	94,668.37	4,756.22	12,057.03	11,498.88	99,982.74
Funds for Scholarships	398,643.71	18,892.32	18,541.69	17,395.00	418,682.72
Funds for Prizes	16,786.08	771.54	.....	550.00	17,007.62
Funds for Relief	1,285,270.06	60,495.96	20,946.71	49,423.46	1,317,289.27
Grand Totals	$14,902,276.32	$703,976.02	$964,601.87	$783,857.42	$15,786,996.79

SCHEDULE R

MINOR FUNDS

Name	Balance June 30, 1921	Income	Other Increases	Expenditures Salaries	Expenditures Other	Balance June 30, 1922
Aeronautics	$1,445.32	$11,063.30	§12,000.00	$10,474.67	$12,761.82	$1,272.13
A. T. & T. Library	2,572.85	2,000.00	.....	1,202.92	800.91	2,569.02
Business Research	1,600.00	.....	.....	.....	1,600.00	.....
Chem. Eng. Cabot Fund (2)	159.01	.....	.....	.....	49.00	110.01
Chem. Eng. Cabot Fund (3)	202.00	.....	.....	.....	202.00	.....
Chem. Eng. Cabot Fund (4)	.....	.....	†2,900.00	.....	1,140.81	1,759.19
Course XV	111.90	135.00	‡2.00	.....	36.00	212.90
Dining Service Reserve	.....	.....	‖4,793.79	.....	.....	4,793.79
Division Fund	.....	500.00	.....	.....	.....	500.00
Elec. Eng. Research	2,635.21	10,000.00	§8,000.00	7,709.20	12,288.88	637.13
Elec. Ry. Traffic Research	1,635.66	.....	.....	.....	1,635.66	.....
Food Engineering Research	.....	1,000.00	†13.33	.....	.....	1,013.33
Hale Spectroscopic Fund	.....	.....	§2,793.36	.....	.....	2,793.36
Math.-Phys. Journal	.....	193.25	§2,000.00	.....	1,773.60	419.65
Maclaurin Memorial	1,496.00	.....	‡30.00	.....	.....	1,526.00
Mech. Eng. Special (2)	.....	.....	¶602.71	.....	.....	602.71
Medical Dept. Special	5,393.48	.....	‡100.00	.....	507.60	4,985.88
Paper Insul. Cable Research	.....	600.00	.....	60.00	739.90	*199.90
Petroleum	398.65	.....	.....	.....	102.63	296.02
Presidents	212.42	.....	.....	.....	.....	212.42
Research Lab. App. Chem.	16,176.93	60,549.45	§9,000.00	43,855.45	18,222.63	23,648.30
Research Lab. Ind. Physics	3,340.53	662.50	§8,000.00	3,286.69	.....	8,716.34
Research Lab. Phy. Chem. Royalties Account	.....	.....	366.55	.....	.....	366.55
Research on Explosives P.O. 34161	.....	5,000.00	.....	.....	.....	5,000.00
Roentgen Ray	1,750.31	.....	‡32.00	.....	172.68	1,609.63
Sargent Fund	.....	1,000.00	.....	.....	.....	1,000.00
Spec. Res. No. 6003	*16.00	3,000.00	**710.00	6.36	3,739.28	*51.64
Spec. Res. No. 13101	11,532.25	2,000.00	.....	.....	4,962.68	8,569.57
Tractive Resistance of Roads	.....	3,000.00	*†1,635.66	851.84	3,886.39	*102.57
Tractive Resistance of Roads No. 2	.....	.....	.....	.....	376.96	*376.96
Torpedo Research No. 53712	.....	3,000.00	.....	6.36	230.95	2,762.69
U. S. Merchant Marine	887.37	3,000.00	.....	.....	3887.37	.....
Women Students' Hospitality Fund	309.96	.....	.....	.....	262.79	47.17
	$51,843.85	$106,703.50	$52,979.40	$67,453.49	$69,380.54	$74,692.72

* Overdraft.
† Appropriation from Cabot Fund.
‡ Interest.
‖ From Dining Service Earnings.
§ Appropriation from Current Funds.
¶ Transfer of Merchant Marine Balance.
** Transfer from Physics and Chemistry.
*† Transfer from Elec. Ry. Traffic Research.

SCHEDULE S

Current Surplus

Balance, July 1, 1921	$59,276.10
Net Decrease, (Schedule A)	12,436.04
Balance, June 30, 1922, (Schedule D)	$46,840.06

Detail of Profit and Loss Account

Losses and Charges:	
Accounts Receivable, charged off	$554.38
Students' Fees and Deposits (previous years), charged off	2,056.28
Loss on sale of Stocks, Bonds, Real Estate, etc.	10,438.76
Stocks charged off	5,629.50
Expense 93–95 Newbury Street, charged off	3,500.24
Stock Inventory, charged off	5,370.33
Adjustment of Physical Chemistry, Royalties Account	366.55
Total Losses	$27,916.04
Gains and Credits:	
Architectural Supply Room	$421.46
Gain on sale of Stocks, Bonds, Real Estate, etc.	14,827.30
Students' Fees and Deposits (previous years)	381.17
Bursar's Checks Outstanding, cancelled	25.32
Total Gains	$15,655.25
Profit and Loss. Net Loss, (Schedule A)	$12,260.79

Publications of the Massachusetts Institute of Technology

BULLETINS

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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