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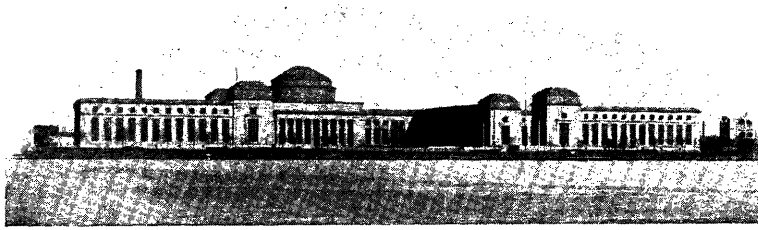

Massachusetts Institute of Technology

President's Report January, 1920

Cambridge, Massachusetts
1920

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

REPORTS

OF THE

PRESIDENT AND TREASURER

THE TECHNOLOGY PRESS
CAMBRIDGE, MASSACHUSETTS
1920

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†Address correspondence to Professor Allyne L. Merrill, Secretary of the Faculty

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REPORT OF THE PRESIDENT

An outline by James P. Munroe, Secretary of the Corporation

At the annual meeting of the Corporation, on October 8, 1919 President Maclaurin stated that he purposed placing, later, in the hands of the members, a formal printed report covering the activities of the Massachusetts Institute of Technology during the fiscal year, 1918-19; but that he would at this meeting depart from the usual custom of reading such a report and, instead, would speak, quite informally, of those activities and particularly of the critical situation of the Technology Educational Endowment Fund.

He then reviewed, in a most interesting way, the services which the Institute had been able to render to the Government during the crisis of the World War, and suggested the many opportunities for effective service which lie before it in the period of reconstruction. He reported upon the astonishing rise in numbers seeking admission to the Institute and analyzed the significance of the distribution of those three thousand students among the four years. He also called attention to the inadequacy of the existing buildings for such an increased number.

He reported briefly upon the status of the Pratt bequest and upon the immediate plans for erecting the building for the department of Naval Architecture made possible by that bequest. He spoke of the coming retirement of Professor Peabody as head of the department, and spoke with enthusiasm of the coming of Mr. Jack from Glasgow to strengthen the personnel.

President Maclaurin explained at some length the manner in which the students returning to the Institute after their notable war service had been aided towards early graduation through summer sessions, etc., and praised the devotion of the members of the teaching staff in co-operating, at much personal sacrifice, in this plan. He touched upon certain far-reaching changes in the curriculum and in methods of teaching (and explained, in outline, the "Technology Plan" for an alliance between the Institute and certain of the industries in the solving of such technical problems as might be presented and as the Institute might properly undertake.)

Finally the President, after calling attention to the greatly increased cost of maintaining the Institute's physical plant, the

need for immediate enlargement of that plant, the added burden of educating a student body increased by fifty per cent, the impending loss of the State subsidy, and the enforced severing of the helpful relations between Technology and Harvard, made clear the absolute impossibility of retaining a teaching staff adequate and competent to the ordinary, to say nothing of the extraordinary, demands which the Institute must meet unless the scale of compensation is materially advanced. He sketched the progress of the Technology Educational Endowment Fund to date and reminded the Corporation that little more than two months remained in which to secure the three million dollars required to meet the conditions of "Mr. Smith's" generous promise of four million dollars. He urged every member of the Corporation to give earnest thought to the problem and active support to the committee charged with the raising of the fund.

Because of his strenuous work in carrying the fund not only to the three million mark before December 31, but to the four million mark before January 10, President Maclaurin found no opportunity to fulfil before his untimely and profoundly lamented death on January 15, 1920 his promise of preparing for the Corporation a formal report of his presidency during the tenth year of his notable service. Therefore there can be offered only the imperfect record, made wholly from memory, of his illuminating verbal presentation, supplemented by the following transcript of the speech read, in his enforced absence, by Professor Sedgwick at the dinner of the Alumni Association on the evening of January 10. At the end of the speech as read, Mrs. Maclaurin having modestly declined to make the public announcement, General du Pont stated in a few appreciative words that the "Mr. Smith" whose generosity had been so unbounded, and whose identity had been so long hidden, is Mr. George W. Eastman, of Rochester, N. Y.

Professor Sedgwick said, "I have been requested by Dr. Maclaurin, in his absence and on his behalf, to read the message which but for illness he would himself have given to us this evening. It is a matter of profound regret that Dr. Maclaurin is unable to be with us, and in what I am about to read I beg you to hear, not the voice of the reader, but the words of our beloved President, who lies seriously ill at his home only a few hundred yards away."

Address of President Maclaurin at Alumni Banquet Boston, January 10, 1920

This is an occasion for general congratulations to the great host of Technology men throughout the country and to the even greater army of Technology's friends outside the circle of the

alumni. The campaign for endowment has gone forward according to schedule and within the time limit set we are over the top and have secured the eight million dollars that we set out to seek. Most of the leading colleges in the country have embarked on similar campaigns. We, I believe, are the first to have won complete victory and I hope that our success will encourage and strengthen all the others. Many men and many minds have contributed to this great accomplishment, notably, of course, the members of the committees of the Corporation and of the alumni. A very special meed of praise is due to Mr. Emerson and his able and enthusiastic assistants. We must not forget, too, how much is due to work done quietly and effectively all through the country by loyal sons of Technology, men who have put business and pleasure aside and worked whole-heartedly for their Alma Mater. The record of the student body in this respect is remarkable and wholly admirable.

Where so many have contributed to a great result it might be invidious to single out a few names, and yet with your permission I am going to say a few words with reference to the special contributions that have been made by three of the Institute's supporters. These three men are in some ways strikingly different in temperament, in training, and in experience, but they have at least one great quality in common — a largeness of vision, a belief in doing things thoroughly, and a determination to carry things forward always on a broad gauge. Their attitude towards Technology should encourage all its friends to have the highest view of its character and destiny and to make it one of the greatest factors in the nation's welfare.

The first of these is the president of the Alumni Association, Coleman du Pont. I hope that Technology men will never forget how large a part he has played (always with characteristic modesty) in the development of the Institute. When I first came to Technology and had had time to take observations I found that the Institute was in the doldrums. It wanted to move but couldn't get a move on. It was clear that some one was needed to give a real push and so, after consultation with my colleagues, I went to describe the situation to Coleman du Pont. That was nine years ago, but I remember the incidents of my visit as if it had happened yesterday. I arrived in Wilmington early in the morning and although du Pont was at that time a very sick man he was up to greet me and greeted me cheerfully. We got to business immediately and it was all settled in ten minutes. I described the broad features of our condition and said that we must move to a new site. He asked what sites were under consideration and wanted a brief description of each. The first one I mentioned was twenty-five acres in area. He said, "Can't you double it?" and I said, "Not this particular site." "Well," he said, "I don't

like the look of twenty-five acres. It seems to me too small. Almost invariably when a man comes to me to approve plans of a new factory"— Mr. du Pont was then president of the Powder Company—"I tell him to double the size of everything, and almost invariably I wish afterward that I had used a larger factor of safety. Technology will occupy a great position in the future and must have room to grow. I don't feel much attracted by twenty-five acres, but I should be interested in fifty." I agreed with his policy, but told him, of course, that the main obstacle was cost. "What would fifty acres cost?" he asked. I told him "Three-quarters of a million," and he said that he would contribute half a million. That was the egg from which so much has grown within the last nine years.

The second man is "Smith." It is not likely that I shall forget the main incidents of my first visit to him now nearly eight years ago. Early in 1912 the Institute had secured options on its present magnificent site of fifty acres bordering on the Charles River Basin in the heart of Greater Boston. At this time I visited the principal of "Mr. Smith's" plants. "Mr. Smith" himself was away but I met a number of leading men in his business and spent a day in looking over the plant. I was greatly impressed with the evidences on all sides of interest in scientific methods, by the number and high quality of the scientific men who were employed not only as technical experts but as executives, and by the careful plans that were made for utilizing scientific improvements at every stage of the company's growth. This evidence of high intelligence everywhere and of appreciation in an unusual degree of the value of scientific men suggested to me that "Mr. Smith" himself might be interested in Technology. Consequently, on his return I wrote to him telling him something of our problems and indicating that I would welcome an opportunity of explaining them more fully at a personal conference. He replied suggesting a date for our meeting and we dined and spent an evening together in New York going over the whole matter carefully and making the best estimates that were possible at that early stage as to the probable cost of the various portions of our undertaking. At this meeting, as at many another since, I could not fail to be impressed with "Mr. Smith's" capacity to go to the heart of a problem quickly and see immediately what the main points are and to keep to those points in later discussion. He was interested in Technology's problem, but made it clear that his continued interest would depend on its problems being attacked in a bold way and in a liberal spirit. He, like Mr. du Pont, believed that Technology had only to embrace its destiny to rise to a position of transcendent usefulness and his only anxiety has been lest at any time narrower views should prevail. He has, as you know, been extraordinarily liberal towards the Institute, always ready

to help it in any important forward movement. He likes things done well, but does not think they are well done unless they are done economically. On the occasion of the dedication of our buildings in 1916 he said: "I heartily congratulate the Corporation and you not only upon the broad-mindedness but upon the conservatism and economy with which the building plans have been carried out. Naturally, I feel great satisfaction in being instrumental in helping you to carry out such far-seeing plans for the development of the Institute, as I feel very strongly that the progress of this country is to be affected greatly by the men who are turned out of the Massachusetts Institute of Technology."

The third man is Rogers — William Barton Rogers, the first President and real founder of the Institute. Technology men generally, although they hold Rogers' name in reverence, do not appreciate sufficiently how much the Institute and the world owe to him. A prophet is not without honor save in his own country and before the war I learned from high technical authorities in Germany how much Rogers' early contributions to the theory and practice of higher technical education were appreciated in Germany. According to one authority there, the extraordinary development of industry in Germany depending so largely on scientific applications was due more to the ideas that the American Rogers expounded in the early days than to those of any German. The most striking thing about Rogers was the breadth of his vision and the large view that he had of the Institute's place in the industrial development of America. It was, of course, a very small thing in his day, but he looked forward with clear vision to its future growth. Observe that he saw the Massachusetts Institute of Technology as much more than a school of industrial science and that he had incorporated in its charter a statement that it was founded for the purpose of instituting and maintaining a school of industrial science and "aiding generally by suitable means the advancement, development and practical application of science in connection with arts, manufactures and commerce." It may seem a far cry from Rogers' day to the so-called Technology Plan about which there is much discussion and some controversy in these days. I hope, however, you will agree that the Technology Plan is a natural outgrowth of Rogers' conception of the Institute and that it presents today one of the "suitable means" whereby the Institute can aid "the advancement, development and practical application of science in connection with arts, manufactures and commerce." The fundamental idea of the Technology Plan is that although the primary purpose of Technology is to train men, Technology itself is much more than a school. Physically, it consists of a vast group of buildings with an extraordinary variety of technical equipment representing almost every branch of applied science outside

the field of medicine. On its human side it consists of a notable group of professors and instructors, between three and four hundred able men competent to deal with the immense variety of scientific knowledge comprised within the limits of the Institute's courses, a great group of students over three thousand in number coming to Technology from every part of the United States and of the world, and an army of alumni over ten thousand strong, rich in experience and power. This, I say, is the Institute, and the purpose of the Institute as Rogers expounded it was to "aid generally by suitable means the advancement, development and practical application of science." The Technology Plan enables the Institute to do this by setting up the right kind of organization to give industrial corporations the information that they want regarding men and scientific processes that are applicable to their industry. A mere school might not be able to do this, but an institution conceived so broadly as Technology is well adapted for this great end.

I seem to have wandered a long way from the subject with which I began and in the short time that remains to me I must return to "Mr. Smith." Nearly eight years ago when he made his first great gift of two and one-half millions to Technology he expressed the wish that his name be withheld. He is a man who instinctively wishes to avoid all fuss and prefers to do things quietly and unostentatiously. He gets infinitely more satisfaction in doing things than in having people talk about them. He would prefer to remain anonymous, but the great gift that he has just made to Technology has been made by transferring to the Institute stock that he owns in the company that he directs. The annual report of the treasurer of the Institute has to be published and in this report the assets of the Institute must be listed, so that it could only be a short time before "Mr. Smith's" identity must be revealed. Knowing how much pleasure it would give Tech men to be told at this time who he is, "Mr. Smith" has consented to a public statement tonight regarding his association with Technology. You will remember that the announcement of "Mr. Smith's" first gift to the Institute in 1912 started a great guessing competition that ran the rounds of the newspapers of the country and that this competition has been revived as a popular pastime on every occasion when another substantial contribution from him to Technology has been announced. At the time of the dedication of our new buildings suspicion centered on two New York millionaires each of whom strongly suspected the other. It is said that they dined together to have it out, but separated without having discovered any secrets, each with enlarged respect for the bluffing powers of the other. As a matter of fact, neither was "Mr. Smith." In another center a man, not "Mr. Smith," claimed to be he and in still another a woman made it known to

her friends that she was certain that "Mr. Smith" was her husband, although she was in error.

The secret has been kept for nearly eight years. Latterly a good many have been told and now I am glad to reward Technology alumni for the manner in which they have responded to "Mr. Smith's" offer by removing all doubt as to his identity. I am often asked a recipe for keeping a secret. It is, after all, very simple. Tell it to no man and to very few women. I have told it to two — my secretary, Miss Miller, and my wife.

Professor Sedgwick continued, "Thus ends Dr. Maclaurin's message. And here he would have disclosed to this impatient audience and a waiting world the name of our munificent benefactor whose personality has so long been a mystery. It would not be fitting that the privilege should be mine of revealing our great magician's name when there is here present another friend of the Institute, another great donor of splendid gifts, and especially when that friend is the president of our Alumni Association. I therefore call upon General du Pont to make, on behalf of Dr. Maclaurin, the long awaited announcement."

REPORTS OF ADMINISTRATIVE OFFICERS

REPORT OF THE LIBRARIAN

The increased use of the Library has been marked during the year 1918-19. No record has been kept of the number of persons using the Library during school hours, but frequently during the winter months the reading room in the Rotunda was so well filled that practically all the chairs at the tables were occupied and students were to be found reading also at the tables in the book stack. With the return to normal conditions at the beginning of January, the reading room was kept open from 5 until 7 P.M. and the attendance was recorded. During the 110 days from January 2 to June 30 the total attendance from 5 to 7 P.M. was 2472, and from 7 to 10 P.M., 1062; the average being 22 persons for the first period and 10 for the second, as compared with 16 and 8 for the corresponding periods of the previous year. The experiment has also been tried of keeping the Library open Saturday afternoon until four o'clock. On 15 Saturdays the average attendance was 31, as compared with 27 last year.

The increase in the circulation of books has kept pace with the increased attendance. The total circulation of books from the Central Library for the period from January 1, 1918, to June 30, 1919, was 9693 volumes, an increase of 1256 over the previous year. It is rather curious that the circulation of unbound periodicals has decreased during the year, the total number having been 739, a decrease of 202 from the previous record. Naturally the circulation varies under the different conditions which occur during different times of the year. The records show that during the period of war conditions, from July 1 to December 31, the average circulation was 25 volumes *per diem*. With the return of normal conditions and full schedule of studies the circulation rose during the period from January 2 to June 14 to 41 volumes *per diem*. During the period of vacation and summer school from June 14 to September 25 the average was 19 volumes *per diem*. From the Departmental Libraries is reported that 270 books circulated during the year from the Geological Department, and 769 from the Mining Department.

The Library has as usual responded favorably whenever possible to requests from other institutions for loans. The number of books lent on inter-library loans has been 70, and we have borrowed 2.

The total accessions to the Library by purchase have been 1646 items, by binding 903, and by gift 2602, of which 1527 are volumes and 1075 are pamphlets and maps, making a total of 5151 accessions. After making allowances for books counted twice and deducting books which have been worn out or lost, the net increase of the Libraries of the Institute has been 4044 volumes, 931 pamphlets, and 82 maps. So that at the end of the fiscal year the total contents of the Libraries was 136,965 volumes and 50,564 pamphlets and maps.

The number of periodicals received by the Institute has always been a large one. During the year a total of 801 titles were on our list. Of these 378 were paid for from the Periodical Fund, 187 from Departmental Funds, and 236 were gifts. The distribution of these periodicals among the several departments, and the cost of the same, are shown in the following table.

Periodicals Received During The Year 1918-1919

CLASSIFIED BY DEPARTMENTS AND METHODS OF PAYMENT

Libraries	Number Received				Estimated Cost		
	Per.	Dept.	Gift	Total	Per.	Dept.	Total
Central Library							
Bibliographical	7	6	4	17	$50.85	$56.98	$107.83
Educational	3	2	6	11	7.25	13.00	20.25
Scientific	2	0	11	13	10.00	.....	10.00
Miscellaneous	2	3	42	47	7.00	12.50	19.50
Department Biology	35	3	14	52	240.00	8.50	248.50
Civil Engineering	42	23	36	101	191.96	102.38	294.34
Electrical Engineering	17	43	12	72	87.47	122.86	210.33
English	16	0	0	16	70.89	.....	70.89
History	8	2	0	10	26.00	10.50	36.50
Mechanical Engineering	27	11	16	54	81.33	30.99	112.32
Modern Languages	7	0	0	7	68.77	.....	68.77
Departmental Libraries							
Architecture	31	2	3	36	154.94	9.00	163.94
Chemistry	34	25	23	82	232.80	130.15	362.95
Economics	26	23	33	82	99.34	77.78	177.12
Geology	17	3	5	25	88.84	15.99	104.83
Mathematics	17	3	2	22	72.25	15.50	87.75
Mining	40	5	14	59	198.69	14.67	213.36
Modern Languages	8	0	1	9	29.57	.....	29.57
Naval Architecture	11	20	3	34	36.99	84.53	121.52
Physics	28	0	9	37	122.17	.....	122.17
Others	0	4	0	4	.....	7.75	7.75
Margaret Cheney Room	0	9	2	11	.....	31.63	31.63
Totals	378	187	236	801	$1,877.11	$744.71	$2,621.82

Until the end of the fiscal year direct trade with Germany was prohibited. The importation of German periodicals however was permitted to a limited extent by license granted to the Committee on Importations of the American Library Association. The Institute is greatly indebted to this committee, of

which Dr. M. L. Raney, Librarian of the Johns Hopkins University, was the secretary and the most active member. Dr. Raney was untiring in his efforts to obtain the periodicals for us and acted as our representative on two trips which he made to Europe to further these ends. As a result of his efforts we have received not only most of the German periodicals to which we subscribed during the years 1918 and 1919, but also books which were ordered prior to the participation of the United States in the war and which had been held in Rotterdam.

The cost of additions to the Library and maintenance, exclusive of salaries, as shown by bills approved, amounts to $8350.82, of which $5784.98 was spent for books and binding, and $1193.11 for subscriptions to periodicals. The accounts to which these different sums were charged are shown on the following table.

BILLS APPROVED 1918-1919

For Books and Binding

Department of Architecture	$183.88
Department of Biology and Public Health	184.03
Department of Chemistry	638.96
Department of Civil and Sanitary Engineering	611.78
Department of Economics	344.01
Department of Electrical Engineering	200.44
Department of English	17.55
Department of Geology	172.54
Department of History	201.60
Margaret Cheney Room	30.30
Department of Mathematics	72.03
Department of Mechanical Engineering	193.20
Department of Mining and Metallurgy	281.17
Department of Modern Languages	38.17
Department of Naval Architecture and Aeronautics	308.49
Department of Physics	165.42
Vail Library	629.55
Walker Memorial	702.47
Flint Fund	34.73
Todd Fund	202.49
General	572.17
Total for Books and Binding	$5,784.98
Periodical Account: Subscriptions	$1,983.11
Office Supplies, Trucking and Repairs	582.74
Total	$8,350.83

The number of cards added to the catalogue was 5708, and 579 were removed. The Central Catalogue at the end of the year contained therefore 151,275 cards.

During the year there were issued for the purchase of books 1729 orders, and for binding 1064 orders.

The Vail Library has been enlarged by the addition of 496 books and 54 pamphlets which were a part of the original Dering Collection. These books had been detained in London, and were sent to us as soon as transportation was available at the close of the war. In addition to these, the Library has been increased by 281 volumes, of which 250 were purchased, 21 were added by binding, and ten were gifts, 630 books and 33 pamphlets of the Vail Library were catalogued and 1500 cards were added to the catalogue. The binding and lettering of the volumes was continued, 882 orders having been issued for this purpose. At the close of the year the Library was moved from temporary quarters in the basement into a more commodious and well lighted room on the third floor of the central building.

Miss Almy having resigned Miss Dorothy G. Bell, S.B. (Simmons), was appointed assistant in charge of the Vail Library. Since her graduation from college Miss Bell had been librarian in the Technical Electrical Engineering Library of Messrs. D. C. and W. B. Jackson.

Among the many gifts received in the Library of the Institute during the year, one that is of special interest is a collection of publications by Professor Henri Bouasse, head of the Laboratoire de Physique in the Université de Toulouse. Professor Bouasse has very kindly sent these with his compliments to the Institute. Chief among the publications is a complete set of the chapters in the second part of his "Courbes de Déformation des Fils," which were originally printed in the Annales de la Faculté de Toulouse.

Among the other gifts, the one of probably the greatest personal interest is a collection of Technology Memorabilia, mementoes which had been gathered by Theodore Grover in course of the many years during which he was a loyal and much respected employee of the Institute. He died August 28, 1918, and these interesting objects, many of them rare photographs of early members of the Institute, have been very kindly donated by his widow.

The Earl of Camperdown has very kindly continued to supply the Institute with the current volumes of several important British publications. Professor George F. Swain has given nine volumes on engineering subjects and a number of pamphlets. Professor D. R. Dewey has contributed many valuable books and pamphlets, and Colonel E. T. Cole has given a large number of books from his private library to the Walker Memorial, including 18 volumes of

British poets. From Mrs. Currier we have received 54 volumes, chiefly public documents which Professor Currier had used in preparation of his course on Government. Other gifts specially worthy of mention are the following:

Donors	Gifts
Major Richard Strong	Report on Trench Fever
Dr. John W. Farlow	Farlow, History of the Boston Medical Library
Technology Monthly and Harvard Engineering Journal Editors	Technology Monthly, 5 bound volumes
Prof. C. E. Fuller and W. A. Johnston:	Fuller and Johnston, Applied Mechanics
Dr. J. C. Warren	Howe: The Human Society
J. E. Gregg	Peabody: Education for Life
Major S. C. Prescott	Examination of Tropical Soils
Messrs. Fay, Spofford and Thorndike:	Report on Public Pier at Portland, Me.
Francisco Lobos, '19	Canto: Chile
Miss Sarah E. Stevenson	Four Mathematical Works
W. E. Hingston	Forgeries and false entries
Charles Storrow, Esq.	Rogers: Commandery of Massachusetts, 1868-1918
G. H. Payne	Payne: The Child in Human Progress
Charles P. Smith, '87	Wery: Assainissement des Villes
R. B. MacMullin, '20	Langer and MacMullin: With "E" of the First Gas
J. E. Stone, '73 and H. H. Edes	Stone: Register of Charlestown Men during Civil War 1861-65
Prof. W. Lindgren	Mineral Deposits, Ed. 2
Prof. A. T. Robinson	Miscellaneous books. 38 Vols., 4 Pamphlets
Prof. C. E. Turner	Collection of war posters
Librarian Botanical Garden, Rio de Janeiro, Brazil	Correa: Fabras Texters e Cellulose

Robert P. Bigelow,

Librarian.

REPORT OF THE REGISTRAR

The opening of the school year because of the epidemic of influenza was postponed three weeks, from September 23 to October 14. The number of students at the opening date was the lowest for many years, but on November 1 enough more had entered to raise the registration to 1821, 123 more than the year before. The number of students usually drops during the last half of the year, but during the past year it rose to 1860. At one time during the year the registration almost reached the 2000 mark in spite of the fact that there was no senior class. A large majority of the senior class completed their work for graduation in October, 1918, just before the school year began — a few remained to graduate later. The number of foreign students was larger than ever and the proportion of such students among the student body rose to 7%.

Because of the war and the Student Army Training Corps a war time curriculum was followed during the first term. The school year was divided into three terms instead of two as for many years. At the end of the first term a transition program was organized to permit returning to a peace time basis.

The new curriculum is arranged for a school year of three terms of ten weeks each; the former consisted of two terms of fifteen weeks each.

In January, 1918, the Faculty arranged for the entrance of a group of students who, although in many instances they had not graduated from the preparatory schools, were students with records of distinction and were prepared to undertake the work of the Institute in the middle of the school year. Again in 1919 a junior section of the first year class was admitted. In 1918 the class was limited to 100, but during the past year about 200 entered this special class. The students who carried on the work from January to June successfully continued work during the summer and if again successful were admitted at the beginning of the new school year as second year students. By this program students were able to save a half year in preparatory school and a half year at college, — a year in their educational program.

As the Student Army Training Corps was organized throughout the whole country with similar programs for technical schools, it might have been expected that fewer students would come to the Institute from the more distant parts of the country. On examining the geographical distribution of our student body for the past year there is found to be very little variation from that of the recent years.

The increase in the proportion of the foreign students would have been expected upon the assumption that the greatest loss of students because of military service would be among the American students. The gain in proportion of foreign students was, however, made both by the loss in number of domestic students and an actual gain in the number of foreign students.

The temporary drop in the number of students from other colleges is accounted for by the sacrifices made in their educational programs by the American college men who not only were drafted into service but volunteered their services to the nation.

The number in the graduating class of 1919, graduated as a mat er of fact in October, 1918, was somewhat lower than usual, but the number of members of this class eventually to receive the degree will be larger. Already a number of members of this class have returned from service to complete their requirements for graduation.

The Scholarship Committee, because of the unusual conditions such as intensive summer work for the class of 1919 and a junior grade section of the class of 1923, recommended awards from the scholarship funds for the summer term of 1918. This would have been a very heavy drain upon the resources available, had it not been for the Student Army Training Corps which provided tuition for such a large proportion of the student body for the school year up to January, 1919. For the second and third terms the awards were reappropriated to meet the changed conditions.

THE CORPS OF INSTRUCTORS

NOVEMBER 1	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18
Professors Emeriti	..	1	1	1	1	1	1	1	1	1	3	3	3	4	4	4	5	5
Retired	..	..	..	..	..	..	1	1	1	1	3	3	3	4	5	7	7	6
Non-Resident	..	2	2	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2
Research (Not counted elsewhere)	..	..	..	..	..	..	..	..	..	..	4	3	1	1	..	..	..	..
Total	..	3	3	4	4	4	5	5	5	5	13	12	10	12	12	13	14	13
Professors	29	27	27	25	32	36	39	39	43	43	40	47	46	59	63	61	59	58
Associate Professors	9	12	14	17	14	17	17	17	14	18	17	16	23	23	23	30	32	29
Assistant Professors	25	25	25	19	24	21	24	32	31	30	33	35	33	36	31	31	33	33
Assistant Professors in Chem. Eng. Practice	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	5	..
Active Faculty	53	64	66	61	69	74	80	88	88	91	90	98	102	118	117	127	129	120
Instructors	50	54	66	67	72	69	72	62	69	66	64	67	74	70	79	90	70	67
Assistants	36	46	51	56	53	52	52	50	51	55	50	49	54	52	58	54	38	35
Faculty, Instructors and Assistants	139	164	187	184	184	215	204	200	208	212	204	214	230	240	254	271	237	222
Research Associates	..	..	..	..	6	8	8	6	12	8	5	3	1	3	3	5	4	1
Research Assistants	..	..	..	..	4	3	3	1	1	5	6	7	8	15	11	14	7	5
Lecturers	40	39	41	33	39	31	32	31	18	21	25	16	19	23	28	31	29	13
Total Members of Staff	179	203	228	217	332	257	247	238	239	246	240	240	258	281	296	321	277	241

YEARLY REGISTRATION SINCE THE FOUNDATION OF THE INSTITUTE

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

THE STUDENTS, 1918-1919

Registration by Classes	Total
Candidates for advanced degrees	14
Fourth year	196
Third year	256
Second year	518
First year	835
Total	1,819

CLASSIFIED AND UNCLASSIFIED STUDENTS BY COURSES* FOR THE YEAR, 1918-1919

Year	Civil Engineering	Mechanical Engineering	Mining Engineering and Metallurgy	Architecture	Chemistry	Electrical Engineering	Electrical Engineering VIa	Biology and Public Health	Physics	General Science	Chemical Engineering	Sanitary Engineering	Geology and Geological Engineering	Naval Architecture	Naval Construction	Electrochemical Engineering	Engineering Administration	Aeronautical Engineering	Mathematics	Total
Graduate	4	1	—	—	2	4	—	—	—	—	—	—	—	—	—	1	—	1	1	14
Fourth year	4	6	8	—	7	10	7	26	2	—	4	1	1	31	6	—	3	80	—	196
Third year	40	43	12	14	10	41	—	5	—	—	46	4	—	12	—	9	20	—	—	256
Second year	63	122	20	13	14	73	—	18	4	—	105	4	—	32	—	6	44	—	—	518
Total	111	172	40	27	33	128	7	49	6	—	155	9	1	75	6	16	67	81	1	984
First Year																				835
																				1819

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

TOTALS OF THE SAME CLASSIFICATION* SINCE 1906

Year	Engineering Courses											Total of Engineering Courses	Architecture	Science Courses				Total of Science Courses	General Science	Mathematics
	Civil Engineering	Mechanical Engineering	Mining Engineering	Electrical Engineering	Chemical Engineering	Sanitary Engineering	Naval Architecture	Naval Construction	Electrochemical Engineering	Engineering† Administration	Aeronautical Engineering			Chemistry	Biology	Physics	Geology			
1906–07	210	214	100	193	55	32	43	18	—	—	—	865	102	51	10	18	2	81	0	—
1907–08	210	227	118	202	59	39	37	16	—	—	—	908	84	53	17	21	0	91	2	—
1908–09	197	197	104	209	71	52	41	13	—	—	—	884	91	60	20	19	2	101	4	—
1909–10	207	204	99	203	84	60	41	14	14	—	—	926	109	44	22	4	1	71	4	—
1910–11	220	198	90	210	128	46	26	9	26	—	—	953	113	44	19	7	0	70	2	—
1911–12	217	214	79	203	129	57	19	8	35	—	—	961	112	56	20	4	2	82	3	—
1912–13	212	243	50	201	149	55	29	6	42	—	—	987	127	60	33	5	2	100	4	—
1913–14	209	279	37	196	141	65	31	7	38	—	—	1,003	130	78	36	12	3	129	3	—
1914–15	197	271	34	205	146	61	25	16	46	57	—	1,057	157	66	44	10	3	123	5	—
1915–16	188	279	46	235	157	60	28	23	50	99	—	1,165	163	59	48	14	4	125	4	—
1916–17	172	270	55	233	173	31	38	26	42	139	—	1,179	142	60	61	11	9	144	4	—
1917–18	160	210	40	186	164	21	40	—	37	119	6	983	80	45	37	10	3	95	1	1
1918–19	111	172	40	135	155	9	75	6	16	67	81	867	27	33	49	6	1	116	—	1

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

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

This table includes first year students

	1913	1914	1915	1916	1917	1918	1919
Engineering Courses							
Civil	264	263	251	234	225	212	240
Mechanical	331	365	329	337	340	270	400
Mining	61	58	49	56	67	63	78
Electrical	244	250	271	282	290	224	252
Chemical	181	205	192	200	267	258	350
Sanitary	80	90	78	69	40	22	16
Naval Architecture	42	52	49	62	74	83	78
Electrochemical	57	53	65	63	55	44	43
Engineering Administration	—	—	102	146	199	150	228
Aeronautical	—	—	—	—	—	—	2
Total Engineering	1,260	1,336	1,386	1,449	1,557	1,326	1,687
Architecture	148	160	183	173	163	74	67
Science Courses							
Chemistry	73	82	82	72	66	52	58
Biology	31	41	51	51	63	35	19
Physics	9	8	16	15	11	12	15
Geology	2	3	6	5	7	3	4
Total Science Courses	110	134	155	143	147	102	96
General Science	3	5	5	4	5	2	2
Special and No Course Classification	18	10	18	17	20	130	8
Grand Total	1,544	1,645	1,747	1,786	1,892	1,634	1,860

RESIDENCE OF STUDENTS

NUMBER OF STUDENTS IN EACH YEAR, FROM 1907, COMING FROM EACH STATE OR TERRITORY

States and Territories	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918
North Atlantic:	1,116	1,126	1,118	1,152	1,212	1,279	1,394	1,434	1,502	1,316	1,436
Connecticut	31	32	33	45	44	45	55	61	69	49	59
Maine	22	20	24	25	24	25	32	23	32	26	34
Massachusetts	839	852	840	860	890	954	1,032	1,060	1,110	1,005	1,020
New Hampshire	24	27	27	29	28	34	34	27	30	26	28
New Jersey	14	14	18	33	34	38	48	54	53	47	58
New York	99	99	106	90	108	102	113	121	122	101	140
Pennsylvania	53	46	37	39	43	42	42	46	57	31	58
Rhode Island	28	30	27	25	33	34	31	35	17	19	26
Vermont	6	6	6	6	8	5	7	7	12	12	11
South Atlantic:	51	44	41	49	45	66	66	72	81	43	50
Delaware	—	1	1	1	2	2	3	5	4	7	3
District of Columbia	10	8	5	13	12	21	18	19	27	10	14
Florida	6	5	1	2	3	5	2	5	7	1	6
Georgia	3	4	5	3	3	4	3	5	5	3	2
Maryland	17	12	14	8	8	16	18	13	9	4	7
North Carolina	1	—	—	1	2	4	2	4	5	4	2
South Carolina	—	2	1	3	—	5	6	9	9	4	3
Virginia	11	10	12	15	13	8	11	8	8	6	9
West Virginia	3	2	3	3	2	1	3	4	7	4	4
South Central:	38	37	37	48	46	43	50	54	49	42	41
Alabama	3	5	4	6	3	5	5	5	5	6	5
Arkansas	1	2	2	2	2	1	2	1	1	—	—
Kentucky	4	4	2	8	7	10	10	8	9	6	5
Louisiana	3	2	5	4	4	5	5	7	7	5	5
Mississippi	3	3	6	8	7	5	6	5	2	4	2
Tennessee	8	8	5	3	2	2	5	5	8	3	3
Texas	16	13	13	17	21	15	17	23	17	18	21
North Central:	121	123	140	141	137	115	115	152	146	124	118
Illinois	23	24	33	30	25	15	27	37	31	27	19
Indiana	9	11	10	9	10	9	7	12	5	9	10
Iowa	14	5	4	9	8	11	10	12	6	1	5
Kansas	4	6	9	7	8	3	4	2	3	1	3
Michigan	7	10	9	9	7	12	14	15	16	14	19
Minnesota	8	10	8	7	14	15	6	5	6	4	5
Missouri	6	7	13	12	13	3	5	10	18	15	14
Nebraska	2	4	6	8	8	8	5	5	5	3	1
North Dakota	3	3	3	3	3	2	3	3	1	—	—
Ohio	30	27	33	37	32	25	28	44	43	42	34
South Dakota	3	5	3	2	2	2	1	3	1	1	—
Wisconsin	12	11	9	8	7	10	5	4	11	7	8
Western:	54	59	53	57	65	63	72	59	52	46	42
Alaska	—	—	—	—	1	1	—	—	—	1	—
Arizona	—	—	1	1	1	—	—	—	1	—	1
California	20	25	21	23	22	23	30	25	22	16	14
Colorado	5	6	9	11	14	13	14	11	8	7	7
Idaho	1	—	—	—	—	1	2	1	2	1	—
Montana	2	3	2	2	4	4	3	2	1	3	6
Nevada	1	—	—	—	—	—	—	—	—	—	—
New Mexico	1	1	—	—	1	1	1	1	—	—	—
Oklahoma	1	—	—	—	1	2	—	—	1	—	2
Oregon	4	7	8	11	14	11	10	5	6	6	7
Utah	5	5	3	3	2	2	—	5	5	5	—
Washington	13	11	9	6	6	5	10	7	4	4	5
Wyoming	1	1	—	—	—	—	—	2	2	3	—

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918
Districts	9	11	15	11	6	6	5	4	5	4	5
Canal Zone	1	1	1	—	—	—	—	—	—	—	1
Hawaii	1	2	2	3	2	1	2	1	—	1	1
Philippine Islands	1	1	4	3	1	2	1	1	2	—	—
Porto Rico	6	7	8	5	3	3	2	2	3	3	3
Total for the United States	1,389	1,400	1,404	1,458	1,511	1,572	1,702	1,775	1,835	1,575	1,692

NUMBER OF STUDENTS IN EACH YEAR, FROM 1908, COMING FROM EACH FOREIGN COUNTRY

	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918
Foreign Countries	72	79	102	101	100	113	114	125	122	123	127
Albania	—	—	—	—	—	—	—	—	—	1	—
Argentine Republic	2	4	5	2	1	—	—	1	1	1	—
Armenia	2	—	—	—	—	—	—	—	—	—	2
Australia	—	—	—	1	—	—	—	—	—	—	—
Austria-Hungary	—	—	2	1	2	1	2	1	1	1	—
Belgium	—	—	—	—	—	—	—	—	—	—	—
Brazil	3	1	2	3	5	7	4	1	1	4	2
Bulgaria	—	1	—	—	—	—	—	1	—	—	—
Canada	15	20	18	19	13	14	15	14	16	10	10
Cape Colony	1	—	—	1	—	—	1	—	—	—	—
Central America	1	—	—	—	2	—	2	—	—	—	—
Chile	1	1	3	1	—	1	—	—	8	10	6
China	10	11	27	36	37	42	46	49	40	42	38
Colombia	—	—	—	—	—	1	3	4	3	2	4
Costa Rica	3	2	1	1	—	1	—	—	1	1	1
Cuba	2	7	5	3	6	7	3	2	8	6	5
Cyprus, Island of	—	—	—	—	—	—	—	1	—	—	—
Denmark	—	—	1	1	—	2	1	1	1	3	1
Ecuador	2	1	1	1	1	1	—	—	1	1	4
Egypt	2	1	1	2	1	1	1	1	1	1	—
England	3	—	1	1	—	—	1	1	1	—	—
Finland	—	—	1	—	—	—	—	—	—	—	—
France	—	—	2	2	3	4	2	—	—	—	—
Germany	—	1	1	2	3	2	2	3	1	—	—
Greece	—	—	—	1	1	1	1	—	—	2	3
Guatemala	—	—	1	—	—	1	1	1	—	1	—
Honduras	1	3	3	2	—	1	1	2	3	3	—
India	2	1	—	—	2	1	2	2	1	—	—
Ireland	1	—	—	—	—	—	—	—	—	—	—
Italy	1	1	1	—	—	—	—	1	2	—	—
Jamaica	1	1	1	1	—	—	—	—	—	—	—
Japan	4	4	4	3	—	1	1	6	8	11	15
Korea	—	—	—	—	2	—	—	—	—	—	—
Mexico	6	10	9	5	4	7	7	10	9	5	5
Newfoundland	—	—	—	1	1	1	—	—	—	—	—
New Zealand	—	1	1	2	1	—	—	—	—	—	—
Nicaragua	—	—	—	—	—	—	—	2	—	—	—
Norway	—	—	1	—	—	—	—	2	3	6	12
Paraguay	1	1	1	1	1	1	1	—	—	—	—
Peru	2	1	2	1	—	2	3	3	—	2	—
Poland	—	—	—	—	—	—	—	—	—	—	—
Portugal	—	—	1	—	—	1	—	1	—	—	—
Russia	2	2	2	3	4	4	5	2	2	1	10
Salvador	—	—	1	—	—	1	—	3	1	—	—
Scotland	—	—	—	—	—	1	1	—	—	—	—
Siam	—	—	—	—	—	—	—	1	1	—	—
South African Republic	—	—	—	—	1	1	—	1	—	—	1
Spain	—	—	—	—	—	—	—	—	—	2	4
Straits Settlements	—	—	—	—	—	—	—	—	—	—	1
Sweden	—	—	—	—	—	—	—	—	—	2	—
Switzerland	—	1	1	1	—	—	—	—	1	—	—
Syria	—	—	1	2	3	2	2	—	—	—	—
Transvaal	2	1	2	—	—	—	—	—	1	—	—
Turkey	1	2	2	1	5	3	6	8	6	5	1
Uruguay	1	—	—	—	—	—	—	—	—	5	2
Total in School	1,461	1,471	1,506	1,559	1,611	1,685	1,816	1,900	1,957	1,698	1,819

WOMEN STUDENTS, 1918–1919

Year and Classification			Course						
			Architecture	Chemistry	Biology and P.H.	Elect. Engin.	Electrochemical Engin.	Total
First Year	Classified	5	—	—	—	—	—	5
	Unclassified	—	—	—	—	—	—	
Second Year	Classified	—	—	—	—	—	—	15
	Unclassified	—	—	—	—	—	—	
	Special	15	5	—	10	—	—	
Third Year	Classified	1	—	—	—	—	1	4
	Unclassified	—	—	—	—	—	—	
	Special	3	2	1	—	—	—	
Fourth Year	Classified	1	—	1	—	—	—	20
	Unclassified	—	—	—	—	—	—	
	Special	19	—	—	19	—	—	
Graduate		1	—	—	—	1	—	1
Total		45	7	2	29	1	1	45

TOTAL REGISTRATION AND NUMBER OF NEW STUDENTS, 1918-1919

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

Graduate Students, 1918-1919

American Colleges and Universities Represented

	1913-14	1914-15	1915-16	1916-17	1917-18	1918-19
Akron	—	—	—	—	3	—
Alabama	2	2	1	2	2	—
Alabama Polytechnic Inst.	1	—	1	2	1	—
Albany Medical	—	—	1	—	—	—
Alfred	—	—	—	—	1	—
Allegheny	1	1	—	—	1	—
Amherst	7	8	6	10	3	1
Arizona	—	—	—	—	1	—
Armour Institute of Tech.	—	—	—	2	1	—
Baldwin	1	—	—	—	—	—
Baltimore Medical	—	1	—	—	—	—
Bates	3	3	—	4	3	—
Baylor	1	2	1	1	—	—
Bellevue	—	1	—	1	—	—
Bellevue Hospital, Medical	—	—	1	—	—	—
Beloit	3	2	1	2	2	—
Bethany	—	—	—	—	1	—
Boston College	2	2	—	3	1	1
Boston University	2	—	1	4	2	1
Bowdoin	4	2	—	4	—	1
Brooklyn Polytechnic Inst.	—	—	—	2	1	—
Brown	4	2	1	2	2	—
Bryn Mawr	—	—	—	—	—	—
Bucknell	1	—	—	—	—	—
Buffalo	—	—	—	—	1	—
California	1	2	3	7	4	—
Canisius	—	—	—	1	—	1
Carnegie Institute of Technology	—	1	—	1	1	—
Case School of App. Science	—	1	—	6	1	—
Catholic University of Am.	—	1	—	5	3	1
Charleston	1	1	2	1	—	—
Chicago	1	1	—	1	1	—
Cincinnati	—	1	1	1	1	1
City of New York	1	2	2	3	7	—
Clark	4	3	2	1	1	2
Clemson Agricultural	1	1	—	—	—	—
Colby	2	1	1	3	2	—
Colgate	1	1	2	2	3	1
Colorado Agricultural	—	—	1	1	—	—
Colorado College	—	1	1	1	—	—
Colorado School of Mines	—	2	—	1	1	—
Colorado University	—	1	—	1	1	—
Columbia	2	3	4	6	3	4
Cooper Union	—	—	—	1	—	—
Cornell University	—	1	2	9	8	5
Cornell (Iowa)	—	—	1	—	1	—
Cotner	—	—	—	1	—	—
Creighton	1	1	1	—	—	—
Dakota Wesleyan	—	—	1	—	—	—
Dartmouth	7	7	4	22	15	1
Davidson	—	—	—	—	1	1
Davis and Elkins	—	—	—	1	1	—
Delaware	—	—	—	—	1	—
Denison	2	2	4	2	2	—
Denver	—	—	—	2	1	—
Doane	—	1	—	—	—	—
Drake	1	—	—	1	—	—
Drury	—	—	—	2	—	—
Earlham	—	1	—	—	—	—
Fargo	—	—	—	1	—	—
Franklin and Marshall	1	—	—	1	—	—
Furman	1	1	1	—	1	—
Geneva	—	—	—	1	—	—
Georgetown	2	1	1	2	1	—
George Washington	—	—	—	—	1	—
Georgia	1	—	1	1	—	—
Georgia School of Tech.	2	1	1	4	2	—
Gonzaga	1	2	2	1	—	—
Goucher	—	—	—	—	—	1
Grinnell	—	—	2	2	—	—
Hamilton	3	3	3	4	2	—
Hamline	1	—	—	—	—	—
Harvard	11	23	44	46	27	4
Haverford	—	—	—	3	—	—
Highland Park	1	—	—	—	—	—
Hobart	1	—	1	1	—	—
Holy Cross	3	1	1	1	3	—
Hospital College of Medicine	—	1	—	—	—	—
Indiana Medical College	—	—	—	—	1	—
Illinois	2	2	3	5	4	1
Iowa State	1	—	1	2	—	1
Jefferson Medical	—	1	—	—	—	—
John B. Stetson	—	—	—	2	—	—
Johns Hopkins	3	1	2	1	—	—
Juniata	—	1	—	—	—	—
Kalamazoo	—	—	—	2	2	—
Kansas	—	—	1	2	4	—
Kentucky	—	1	1	1	1	1
Kenyon	—	1	—	—	—	—
Lafayette	1	2	—	1	—	—
Lake Forest	—	—	1	1	2	—
Lawrence	—	—	—	1	1	—
Lehigh	—	—	—	4	5	—
Leland Stanford Junior	—	1	1	2	1	—
Lincoln	—	—	—	1	—	—
Lombard	—	—	1	1	1	—
Louisiana State	—	—	—	1	1	—
Louisville	—	—	—	1	—	—
Loyola	—	1	1	1	1	—
McMaster University	—	—	—	—	1	—
Maine	1	—	3	7	2	1
Manhattan	—	—	—	—	1	1
Marietta	—	1	1	—	—	—
Maryville	—	—	1	1	1	—
Massachusetts Agricultural	—	1	1	6	3	—
Mass. Institute of Tech.	22	32	3	16	14	8
Mercer	—	—	—	—	1	—
Miami	—	1	2	2	3	—
Michigan	6	3	4	4	2	2
Michigan Agricultural	—	1	1	—	—	—
Michigan College of Mines	—	—	1	1	—	1
Middlebury	3	2	1	2	—	1
Millsaps	—	—	—	—	1	—
Minnesota	1	1	2	3	2	1
Mississippi	—	—	—	—	1	—
Mississippi Agricultural and Mechanical	2	3	3	2	—	—
Missouri	—	—	1	3	2	—
Monmouth	—	—	1	1	—	—
Montana	1	—	—	—	1	—
Montana School of Mines	—	—	—	—	1	—
Moore's Hill	—	—	1	1	1	—
Mount Holyoke	—	2	—	1	—	1
National Univ. Law School	—	—	1	—	—	—
Nebraska	1	—	—	1	1	—
Newberry	—	—	—	1	—	—
NewHampshire Agricultural and Mechanical	—	—	—	1	1	—
New Mexico	1	1	—	—	—	—

GRADUATE STUDENTS, 1918-1919—*Continued*

American Colleges and Universities Represented

	1913–14	1914–15	1915–16	1916–17	1917–18	1918–19
New York University	3	1	—	2	1	—
North Carolina	2	—	2	6	4	—
North Dakota Agricultural	1	—	—	—	—	—
Northwestern	1	1	—	3	1	—
Norwich	—	—	—	4	1	—
Notre Dame	—	—	—	2	4	1
Oberlin	3	1	2	5	—	—
Occidental	2	—	1	1	2	—
Ogden	1	1	2	1	—	—
Ohio Northern	—	1	—	—	—	—
Ohio State	—	—	2	2	—	—
Ohio University	—	—	2	1	—	—
Ohio Wesleyan	—	1	1	1	1	—
Oklahoma Agr. and Mech.	1	—	—	1	—	1
Oregon	1	1	1	—	1	1
Oregon Agricultural	—	1	1	1	3	2
Otterbein	—	—	—	—	—	—
Park	1	1	—	—	—	—
Pennsylvania (Gettysburg)	—	—	1	2	—	—
Pennsylvania Military	1	1	—	—	—	—
Pennsylvania State	1	1	1	3	—	2
Pennsylvania University	—	3	2	10	5	—
Pittsburgh	—	1	1	—	1	1
Pomona	—	—	—	—	1	—
Princeton	6	6	6	9	4	2
Purdue	3	3	3	3	2	1
Radcliffe	1	—	2	4	4	7
Randolph-Macon	—	1	—	—	—	—
Reed	—	—	1	1	—	—
Rensselaer Polytechnic Inst.	—	—	—	3	1	1
Rhode Island State	—	—	1	1	1	—
Rice Institute	—	—	—	1	1	—
Rochester	—	1	3	7	4	—
Rose Polytechnic Institute	—	—	—	—	4	1
Rutgers	—	—	—	1	—	—
Rush Medical College	—	—	—	—	1	—
Saint Anne	—	—	—	1	—	—
St. Anselm	—	—	—	1	1	—
Saint Francis Xavier	—	—	—	1	1	—
Saint Francis Xavier (Antigonish, N. S.)	—	—	—	—	2	—
St. Joseph's (Philadelphia)	—	—	—	—	—	1
Saint Louis	—	—	—	—	—	—
Saint Mary's	1	1	—	—	—	—
Saint Olaf	1	1	—	1	—	—
Simmons	—	—	—	—	—	1
Simpson	2	2	—	—	—	—
Smith	2	1	2	—	1	1
South Carolina	—	—	—	2	—	—
South Carolina Military	—	2	1	3	3	—
South Dakota State	—	—	—	—	—	—
Southern California	1	1	—	—	—	—
Southwestern	1	1	—	—	—	1
Spring Hill	4	2	3	1	—	2
Stevens Institute of Tech.	—	1	—	—	3	1
Syracuse	1	3	1	2	1	—
Tennessee	1	2	2	1	1	—
Texas	3	4	2	3	4	1
Texas, Agr. & Mech. Coll. of	1	—	4	4	2	—
Throop	—	—	—	2	—	—
Trinity (Hartford, Conn.)	—	3	2	—	1	—
Trinity (Washington, D.C.)	—	—	2	2	1	—
Trinity (N. C.)	—	—	1	—	—	—
Tufts	—	3	1	14	7	—
Tulane	—	—	1	1	1	—
Union	1	1	1	2	3	—
U. S. Military Academy	1	—	—	3	1	—
U. S. Naval Academy	8	10	15	22	1	6
University of the South	—	—	—	1	—	—
Ursinus	1	1	1	1	—	—
Utah	—	—	—	2	3	—
Utah Agricultural	—	—	—	1	—	—
Valparaiso	—	1	—	1	1	—
Vanderbilt	—	—	—	1	1	1
Vermont	1	—	—	2	3	—
Virginia	1	5	4	3	3	—
Virginia Military	—	3	7	5	4	1
Virginia Polytechnic Inst.	1	—	1	—	—	—
Washburn	—	1	1	3	—	—
Washington	—	1	—	6	2	—
Washington (St. Louis)	—	—	—	—	1	—
Washington and Jefferson	1	1	—	2	1	—
Washington and Lee	1	1	2	4	3	6
Washington State	—	—	—	1	—	—
Wellesley	—	—	1	—	2	2
Wesleyan	—	1	1	7	5	2
Western Reserve	—	1	—	1	1	—
West Virginia	—	—	1	—	—	—
Whitman	1	1	1	—	1	—
William Jewell	—	1	1	—	1	—
William and Mary	1	2	1	1	—	—
Williams	11	10	12	10	5	—
Wisconsin	2	1	2	4	4	1
Wittenberg	—	—	1	—	—	—
Wofford	—	—	—	1	—	1
Wooster	2	2	3	3	1	—
Worcester Polytechnic	1	—	—	9	11	2
Wyoming	—	—	1	2	4	—
Yale	8	19	25	21	10	1

GRADUATE STUDENTS, 1918-1919—*Continued*

Foreign Colleges and Universities Represented

	1913-14	1914-15	1915-16	1916-17	1917-18	1918-19
Acadia University	—	—	—	2	—	—
Aix la Chapelle	—	—	—	—	1	—
Alexander-Kharxoff Inst.	—	—	—	—	—	1
Anhui Provincial (China)	2	—	—	—	—	—
Belgian Institute (Liege)	—	—	—	2	—	—
Cambridge (England)	—	—	—	1	—	—
Cape Town University	—	—	—	—	—	1
Central Technical	—	—	1	—	—	—
Central Turkey	1	1	1	3	—	—
Central University of Quito	—	—	—	1	1	1
Chalmers Institute of Technology (Sweden)	—	—	—	—	1	—
Chile	1	—	—	2	4	—
Chi-li Provincial (China)	1	1	1	—	—	—
Chinese Naval	4	4	4	4	2	—
Christiania	—	—	—	—	1	—
Colegio Mayor de Unestra del Rosario	—	—	1	1	1	—
Dalhousie	1	1	—	1	—	—
Dulwich College	—	—	—	—	1	—
Durham	—	—	3	—	—	—
Ecole Polytechnique (Montreal)	—	—	1	—	—	—
Escuela Industrial (Buenos Ayres)	—	—	—	—	—	—
Euphrates (Turkey)	—	—	—	1	2	1
France	1	—	—	—	—	—
Gymnasium of Salonica	—	1	—	—	—	—
Havana	2	—	—	2	2	2
Hong Kông	—	—	—	—	2	—
Imperial German Naval Col.	—	—	—	1	—	—
Imperial Polytechnic (Shanghai)	8	7	2	—	—	—
Imperial Technical School (Moscow)	—	—	—	—	1	—
Inst. National of Honduras	—	—	—	2	1	—
Institute National Central (Salvador)	—	—	2	1	—	—
Japanese Naval Engineering (Tokio)	1	—	—	1	1	—
Knarof Imperial University	—	—	—	—	1	—
Kiang Nan Provincial	1	1	1	—	—	—
Kông. Techn. Hochschule	—	—	1	—	—	—
Kynshn Imperial University	—	—	—	—	—	1
Kyoto Imperial	—	—	1	2	1	—
London University	—	—	1	1	—	—
McGill (Montreal)	1	—	—	4	1	—
McGill (Vancouver)	—	—	—	1	1	—
Mackenzie College	—	—	—	—	1	—
Madrid	—	—	—	—	1	—
Manitoba	—	2	1	2	—	—
Meizi College of Technology	—	—	—	1	1	—
Montevideo	—	—	—	—	1	—
Nanyang	—	—	—	4	6	—
National (Paraguay)	1	1	—	—	—	—
Naval Academy (Chile)	—	—	—	6	6	1
Naval College (Canton)	—	—	3	1	—	—
Naval College (Cheetoo)	—	—	1	—	—	—
Norges Techniske Hoiskole	—	—	—	—	—	1
Norway	—	—	—	—	—	1
Osaka Technical	—	—	—	—	2	—
Paris	—	—	—	2	—	—
Pei-Yang	—	—	—	—	2	—
Pekin	—	—	1	1	—	—
Petrograd Naval College	—	—	—	—	—	1
Petrograd Polytechnic	—	—	—	—	—	1
Philippines	—	1	—	1	—	—
Porto Algere School of Engineering	—	—	—	—	1	—
Presidency (Calcutta)	1	1	1	—	—	—
Robert College (Turkey)	—	—	—	1	—	—
Royal Inst. of Technology (Stockholm)	—	—	—	—	1	—
Royal Tech. (Copenhagen)	1	—	—	—	1	—
St. Francis	—	—	—	—	—	3
Saint John's University (Shanghai)	2	2	3	2	2	1
Santa Clara (Cuba)	—	1	1	2	2	—
Syrian Protestant	3	3	4	3	2	—
Tangshan Engineering	—	—	—	—	—	2
Technical Hochschule (zu Darmstadt)	—	—	—	2	1	—
Technical Hochschule (Karlsruhe)	—	—	—	1	1	—
Technical Hochschule (zu-Sachen)	—	—	—	1	1	—
Technical School of Athens	—	—	—	—	1	1
Tokio Imperial	—	—	4	2	2	1
Tomsk Institute of Tech.	—	1	—	—	—	—
Tong-Shan Eng. College	—	—	—	1	3	—
Toronto	1	2	—	1	1	—
Tsing Hua	—	2	2	11	6	—
Turin	—	—	—	1	1	—
Union Medical (Pekin)	—	—	1	—	—	—
Universidad National	—	—	—	1	—	—
Waseda University	—	—	—	—	1	1
Wuchang (China)	1	1	—	—	—	—

Graduates who are candidates for Advanced Degrees	14
Graduates who are pursuing undergraduate work	103
American Colleges and Universities represented	65
Foreign Colleges and Universities represented	17
Total	**199**

NEW STUDENTS FROM OTHER COLLEGES BY YEARS, 1918-1919

Class Joined at Institute	Years Spent at College				Total
	One	Two	Three	Four, or more	
First year	45	15	7	8	75
Second year	23	32	6	13	74
Third year	3	11	13	10	37
Fourth year	1	5	20	66	92
Graduate year					
Total	72	63	46	97	278

COLLEGE STUDENTS AMONG THE COURSES, 1918-1919

Graduates and Students from Colleges. 20% of the Total Student Body	First Year	Civil Engineering	Mechanical Engineering	Mining Engineering	Architecture	Chemistry	Electrical Engineering	Biology and Public Health	Physics	General Science	Chemical Engineering	Sanitary Engineering	Geology	Naval Architecture	Electrochemical Eng.	Engineering Administration	No Course Classification	Aeronautical Engineering	Mathematics	Total
Graduates	10	9	8	6	1	8	9	12	—	—	6	1	1	13	1	1	9	20	2	117
Non-graduates	79	16	26	10	8	7	22	2	1	—	34	2	—	11	2	20	10	7	—	257
Total	89	25	34	16	9	15	31	14	1	—	40	3	1	24	3	21	19	27	2	374

SUMMER SCHOOL

	1918	1919
Number from other colleges and schools attending	145	351
Number not referring to any other school or college	6	44
Number from Massachusetts Institute of Technology	356	496
	507	891
Registrations for failures or deficiencies	143	399
Registrations to anticipate work	578	1382
Number who attended Summer School but did not return for Registration	185	72

NUMBER OF STUDENTS REGISTERED IN EACH OF THE COURSES OF THE SUMMER SCHOOL FOR THIS YEAR AND THE YEAR BEFORE

	1918	1919
Algebra B	36	94
Applied Mechanics	26	108
Bacteriology, Elements of	23	0
Chemistry, Inorganic and Analytical	175	223
Chemistry, Theoretical	0	23
Constructive Design	0	2
Descriptive Geometry	47	81
Design, Architectural	1	0
Economic Geology, Adv.	1	0
Electrical Engineering, Elements of	1	47
Electrical Engineering Lab.	1	48
Electrical Engineering, Prin. of	0	33
Electrochemistry	1	0
Electrochem. Lab.	1	0
English	7	26
Epidemiology and Industrial Hygiene	2	0
Forging	4	9
French	21	39
German	21	28
Hydraulics, Theoretical	0	11
Machine Tool Work	0	30
Mathematics	50	121
Mechanic Arts	23	33
Mechanical Drawing	23	58
Mechanical Eng. Draw.	10	45
Mechanism	13	41
Metallography	1	0
Organic Chemical Laboratory	0	18
Physical Laboratory	14	0
Physics and Lab.	22	0
Physics	0	124
Physics Entrance	38	110
Precision of Measurements	14	0
Public Health Lab. Methods	27	0
Public Health Practice	1	0
Railroad Drafting	0	14
Shades and Shadows	2	0
Solid Geometry	56	110
Structures	0	21
Surveying	49	23
Vise and Bench Work	0	7
Vital Statistics	1	0
Woodwork and Pattern Making	0	7
Surveying Camp		
Railroad Field Work, 120.	65	85
Surveying, 103	7	12
Surveying, Geodetic and Topographic, 108	65	84
Surveying, Hydrographic, 160	65	85
Surveying, Plane, 107	65	84
Surveying, Underground, 104	7	15

GRADUATES BY YEARS AND COURSES

Year	Civil Engineering	Mechanical Engineering	Mining Eng. and Metallurgy	Architecture	Chemistry	Electrical Engineering	Natural History or Biology	Physics	General Course	Chemical Engineering	Sanitary Engineering	Geology	Naval Architecture	Electrochemical Engineering	Engineering Administration	Total	Total by Decades
1868	6	1	6	—	—	—	—	—	1	—	—	—	—	—	—	14	
1869	2	2	—	—	1	—	—	—	—	—	—	—	—	—	—	5	
1870	4	2	2	—	1	—	—	—	1	—	—	—	—	—	—	10	29
1871	8	2	5	—	2	—	—	—	—	—	—	—	—	—	—	17	
1872	3	1	5	—	3	—	—	—	—	—	—	—	—	—	—	12	
1873	12	2	3	1	7	—	—	—	1	—	—	—	—	—	—	26	
1874	10	4	1	1	—	—	—	—	2	—	—	—	—	—	—	18	
1875	10	7	6	1	1	—	—	1	2	—	—	—	—	—	—	28	
1876	12	8	8	—	5	—	2	3	4	—	—	—	—	—	—	42	
1877	12	6	8	4	2	—	—	—	—	—	—	—	—	—	—	32	
1878	8	2	2	3	3	—	—	—	1	—	—	—	—	—	—	19	
1879	6	8	3	1	3	—	1	1	—	—	—	—	—	—	—	23	
1880	3	—	3	—	1	—	—	—	1	—	—	—	—	—	—	8	225
1881	3	5	6	3	8	—	1	—	2	—	—	—	—	—	—	28	
1882	2	5	5	3	6	—	1	1	1	—	—	—	—	—	—	24	
1883	3	7	5	1	3	—	—	—	—	—	—	—	—	—	—	19	
1884	5	6	13	—	12	—	—	—	—	—	—	—	—	—	—	36	
1885	4	7	8	2	4	2	—	—	1	—	—	—	—	—	—	28	
1886	9	23	7	1	7	10	1	—	1	—	—	—	—	—	—	59	
1887	10	17	8	1	9	8	1	1	3	—	—	—	—	—	—	58	
1888	11	25	4	5	10	17	3	1	1	—	—	—	—	—	—	77	
1889	14	24	5	3	8	17	1	1	2	—	—	—	—	—	—	75	507
1890	25	28	3	5	13	18	3	2	6	—	—	—	—	—	—	103	
1891	18	26	4	6	11	23	3	3	1	7	—	1	—	—	—	103	
1892	22	26	4	13	7	36	6	1	7	4	6	1	—	—	—	133	
1893	25	30	5	2	8	41	2	—	6	8	—	2	—	—	—	129	
1894	21	31	4	14	11	33	1	3	5	12	3	—	—	—	—	138	
1895	25	30	3	15	14	33	—	2	4	11	4	—	5	—	—	144*	
1896	26	34	10	24	17	48	3	3	7	7	4	3	5	—	—	190*	
1897	25	40	7	16	20	33	2	3	7	12	4	1	9	—	—	179	
1898	32	41	7	29	25	33	3	4	6	9	3	—	7	—	—	199	
1899	30	37	9	22	22	32	2	2	1	10	1	—	8	—	—	173*	
1900	32	34	21	21	19	23	3	3	5	11	4	—	9	—	—	185	1,573
1901	37	39	18	21	17	25	1	1	6	14	4	1	16	—	—	200	
1902	24	46	14	18	14	35	5	3	3	9	7	—	14	—	—	192	
1903	26	37	27	15	13	39	1	3	1	10	4	1	12	1†	—	190	
1904	34	45	32	24	15	34	3	5	5	7	2	1	17	8†	—	232	
1905	46	54	26	12	23	31	3	—	3	13	5	1	24	3†	—	244	
1906	47	69	38	22	21	37	2	4	—	10	6	—	19	3†	—	278	
1907	37	52	22	21	10	32	—	—	—	14	3	2	10	5†	—	208	
1908	48	61	19	19	16	38	4	—	—	15	2	—	5	2†	—	229	
1909	51	41	30	18	12	42	5	3	—	13	9	—	5	3	—	232	
1910	57	57	24	18	10	36	3	—	2	18	12	—	11	3	—	251	2,256
1911	46	49	17	10	12	49	1	1	2	19	15	—	6	5	—	231*	
1912	55	47	21	21	7	52	4	2	1	31	14	—	3	3	—	260*	
1913	58	50	20	26	12	43	2	1	—	30	15	—	4	8	—	269	
1914	60	65	17	19	9	51	6	1	4	37	19	—	8	8	—	301*	
1915	49	69	5	30	23	42	3	3	2	33	12	—	7	10	—	286*	
1916	45	84	5	37	11	56	5	3	2	32	18	—	9‡	14	—	318*	
1917	48	62	14	26	12	44	10	1	5	43	17	2	9†	10	37	338*	
1918	43	54	6	24	10	42	3	3	3	31	3	1	2	9	17	250*	
1919	38	45	6	12	6	40	8	2	1	34	6	—	7	4	17	224*	
Totals	1,282	1,553	549	584	516	1,170	108	71	118	504	202	17	231	99	71	7,067*	

Names counted twice, students graduating in two different years	24
Bachelors of Science	7,043*
Masters of Science, not including 161 counted above	197
Doctors of Philosophy and of Engineering, not including 16 counted above	23
Total	7,263*

*Deducting names counted twice (students graduating in two courses).
†Prior to 1909 this Course was designated as Option 3 (Electrochemistry) of Course VIII.
‡Two received the degree in XIIIB in 1916 and three in 1917.

DOCTOR OF PHILOSOPHY

Year	Biology	Chemistry	Geology	Physics	Physical Chemistry	Total
1907	—	—	—	—	3	3
1908	—	1	—	—	2	3
1909	—	—	—	—	—	—
1910	—	—	1	—	1	2
1911	1	—	—	—	—	1
1912	—	3	3	—	—	6
1913	—	1	—	—	—	1
1914	—	2	—	—	—	2
1915	—	2	—	—	—	2
1916	—	1	1	1	—	3
1917	—	3	1	—	—	4
1918	—	3	1	—	—	4
1919	—	—	—	1	—	1
Total	1	16	7	2	6	32

DOCTOR OF ENGINEERING (*Discontinued after 1918*)

Total	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

Master of Science	Civil Engineering	Mechanical Engineering	Mining Engineering	Architecture	Chemistry	Electrical Engineering	Biology and Pub. Health	Physics	General Science	Chemical Engineering	Sanitary Engineering	Geology	Naval Architecture	Naval Constr'n, U. S. N.	Naval Construction, Foreign Students	Aeronautical Engineering	Electrochemical Eng.	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	5	1	—	—	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	—	—	—	—	—	—	—	—	—	2	1	1	—	16
Total	28	26	8	84	33	43	11	6	1	20	10	3	3	63	5	17	3	1	1	366

WALTER HUMPHREYS,
Registrar and Recorder.

REPORTS OF DEPARTMENTS

DEPARTMENT OF CIVIL AND SANITARY ENGINEERING

The activities of the Department during the past year were carried on under unusual conditions. The graduation of the fourth year class in mid-September, and the establishment of the Student Army soon thereafter resulted in little undergraduate work being required of our staff for students above the third year, except for small classes composed of foreign students and students physically unqualified for military service. After the first of January, however, with the abolition of the Student Army and the return to more normal conditions, practically all the usual courses were offered, special classes in third and fourth year subjects being voluntarily held by members of the regular Institute staff and by Professors George F. Swain and Lewis J. Johnson of Harvard, for such former students as were discharged from the service promptly and were able to return to their studies.

Members of the instructing staff have been promoted to assistant professorships during the year as follows:

Howard B. Luther, S.B., Dipl. Ing., assistant professor of Civil Engineering; John B. Babcock, 3d, S.B., assistant professor of Railroad Engineering; Hale Sutherland, A.B., S.B., assistant professor of Structural Engineering.

Mr. Luther, who has been a member of our instructing staff for eight years, was graduated from the Civil Engineering course in 1908. Following graduation he served as assistant in Civil Engineering for two years. He then went abroad and spent two and one-half years at the Technische Hochschule in Dresden, from which he received the degree of Dipl. Ing. in February, 1913. During this period he held a fellowship from the Institute, being for a portion of the time classified as a Russel Fellow and for the remainder of the time as an Austin Fellow. Upon his return he was appointed instructor in Civil Engineering, which position he has held since. From June, 1917, to March, 1919, he was on leave of absence, serving first as lieutenant, junior grade, and then as lieutenant, in the United States Navy. During the latter part of this period he was in charge of the Engineering Section of the Aircraft Division, Bureau of Construction and Repair, and was entrusted with the duty of reviewing the designs submitted by manufacturers, making preliminary studies for experimental designs, and supervising structural tests. Following

the signing of the armistice, he resigned from the Navy and returned to the Institute in March, 1919.

Mr. Babcock entered upon professional practice in 1910 immediately following his graduation from our Civil Engineering course, and was continuously engaged in engineering work until February, 1916. During this period his work was largely in railroad engineering, which included service as resident engineer upon railroad construction, and as assistant secretary of the Boston Terminal Commission. He also served for a year as resident engineer upon the construction of a hydraulic power plant, and following this was for a while designing engineer for a hydraulic dam company. Since February, 1916, he has held the position of instructor in Railroad Engineering at the Institute. During this period he has kept in close touch with professional practice, having made numerous reports upon railway engineering matters, and having served in 1917-1918 as statistician and clerk for the Street Railway Investigation Commission, reporting to the Massachusetts Legislature.

Mr. Sutherland was graduated from Harvard University with the degree of A.B. in 1906. After one and one-half years' business experience in California, he came to Technology as a student and was graduated from our Civil Engineering course in 1911, having served during the last year of that time as part-time assistant in Mechanical Drawing. He was then engaged in professional practice until September, 1913, when he was appointed instructor in Civil Engineering at the Institute, serving continuously in that capacity until entering the Army in the spring of 1917. From April, 1917, to August, 1919, he was with the United States Engineers, holding the commission of first lieutenant and serving in France for twelve months.

Assistant Professor James M. Barker, who was appointed an instructor in Civil Engineering in 1914, and promoted to the grade of assistant professor in 1916, resigned in August to enter the employ of the First National Bank of Boston. While connected with the department, Professor Barker was in charge of the instruction in Structural Engineering to third year students, and in Bridge Design to fourth year students, a field in which he showed marked ability. It is to be regretted that the department was not able to retain his services for a longer period.

H. L. Bowman, M.S., and W. A. Liddell, S.B., have been appointed as instructors for the coming year.

Mr. Bowman was graduated from Pennsylvania State College in June, 1911. He was engaged in professional practice from that date until September, 1913, when he came to the Institute for a year of graduate study, receiving our degree of Master of Science in Civil Engineering in June, 1914. He then returned to professional work and has since been continuously engaged in

structural engineering practice except from February to June, 1915, when he acted as instructor in Structural Engineering at Purdue University.

Mr. Liddell was graduated from our Civil Engineering course in 1916. He served as an assistant in the Department from August, 1916, to August, 1917, during which time classes were continuous. From August, 1917, to May, 1918, and from January to October, 1919, he was employed in the Engineering Department of the American Telephone and Telegraph Company. From May to December, 1918, he was in service in the United States Army.

The following graduates of the Department served as assistants during the whole or a portion of the academic year: Charles T. Kennedy, S.B., Hall Nichols, A.B., S.B., and Henry E. Wilson, S.B. Other necessary assistants were obtained by the temporary employment of students, and during the period of the Student Army by the assignment, for this purpose, by the military authorities of members of the Student Army.

Of the graduates of the Department up to and including the class of 1919, 365 are known to have been in active military or naval service, of whom 293, or 80.3%, held commissions. Two hundred non-graduates are also recorded as having been in active service, of whom 135, or 67.5%, held commissions. Several graduates and former students served in the Canadian and British armies. The Department records also show that 57 graduates were attached to either the Army or Navy in a civilian capacity.

With sincere appreciation and deepest honor for their services to the country, the names of former students of this Department who died in service during the Great War are included in this report.

Alexander, E. P., '14	Died of disease, in France, September 5, 1918
Arey, R., '13	Lost at sea, December 23, 1918
Bascom, E. D., '15	Killed in action, November, 1918
Bryant, C. D., '14	Died of disease in France, January, 1918
Chidsey, H. C., '20	Died of disease at Fort Monroe, November, 1918
Fellows, R. H., '09	Killed in action at Chateau Thierry, July 17, 1918
Ingraham, F. T., '16	Died of disease in United States, April, 1918
Jones, G. R., '07	Died of disease at Camp Benning, Ga., December 21, 1918
Kelly, J. G., Jr., '14	Killed in accident in France, early in 1918
Malcolm, R. R., '15	Died of disease en route to United States early in 1919
Mayers, H. P., '16	Killed in No Man's Land, July 31, 1918
Miller, E. T., '14	Killed in accident at St. Paul, Minn., October 13, 1918
Milliken, A. S., '14	Killed in action, March 30, 1918
Parsons, A. M., '18	Killed in accident at Taliaferro Field, Texas, July 3, 1918
Rideout, P. A., '11	Killed in action near Verdun, October, 1918
Ware, E. A., '09	Died of disease in France, previous to November, 1918

The marked heroism and distinguished ability shown during the war by our past students is clearly indicated by the following list of those who received distinguished honors for military service:

ALDRICH, E. H., '20	Divisional Citation
	Croix de Guerre
	American Field Service Medal
BENTON, C. R., '10	Citation
COHEN, S. K., '10	Company Citation
DREW, C. D., '99	Cited by General Pershing
	Military Cross (British)
FALLON, N., '06	Citation from Royal Navy and from the United States Navy
FELTON, S. M., '73	Distinguished Service Medal
FOX, C. E., '14	Two decorations from Serbian Government
KENNEY, G. C., '11	Distinguished Service Cross
LONGLEY, F. F., '05	Distinguished Service Medal
MCVICKAR, L., '18	Distinguished Service Cross
	Divisional Citation
MAYERS, H. P., '16	Recommended for Distinguished Service Cross
MENDENHALL, F. D., '14	Distinguished Service Cross
POLAND, W. B., '90	Given Cross of Chevalier of Legion of Honor by President Poincaré. Later commissioned Commander of the Legion of Honor
RIDEOUT, P. A., '11	Distinguished Service Cross
SAUL, T. M., '10	Distinguished Service Cross
STUBBS, A. R., '15	Recommended for Distinguished Service Cross

The eighth session of the Summer Surveying Camp was held during the summer from August 4 to September 26, inclusive. The attendance consisted of ninety-eight students. Eighty-seven of these students were from Courses I, III, XI, and XV, Option 1, in which attendance is required, the remainder coming from miscellaneous courses at the Institute and from other institutions.

The instructing staff included Professors A. G. Robbins, G. L. Hosmer, J. W. Howard, H. B. Luther, and J. B. Babcock, 3d, of the regular instructing force; Professor A. R. Cullimore, Dean of Delaware College, Mr. J. R. Griffith, B.S., and the following assistants: D. L. Starr, S.B., '18, Scott Keith, S.B., '19, R. J. Hole, G. W. McCreery, A. R. Frey, H. R. Kepner, Norman Dawson, G. K. French, and John Lucas.

It was again impossible to obtain a resident physician at the compensation available, but no illness or serious accidents occurred, and such medical attendance as was required was furnished by local doctors.

The expenses of the camp during the season were again high owing to the high cost of supplies and transportation, the total cost per student for meals and miscellaneous expenses necessary for the operation of the camp being $1.47 per day as compared with $1.41 per day in 1918. The total charge for these items for the camp session was $77.91 per man.

The class in Underground Surveying was held at the mine of the Vermont Copper Company at South Strafford, Vt., through the courtesy of Mr. N. O. Lawton, general manager of the company. The camp was in charge of Professor Howard, with Mr. Griffith as instructor. It was attended by fourteen students.

The demand for graduates of the Department has been extremely urgent since early spring, applications from employers being far in excess of the available supply. There is every evidence that this demand will continue to exist.

The thanks of the Department are due to the Holyoke Water Power Company for the use of the Holyoke testing flume by the graduate class in Water Power Engineering, and to the proprietors of Locks and Canals at Lowell for permission to occupy their stream gauging station.

C. M. Spofford.

DEPARTMENT OF MECHANICAL ENGINEERING

The total number in the instructing staff of the Mechanical Department was much smaller during the year '18-'19 than for many years. As there was no senior class the reduction in the size of the teaching staff did not affect the efficiency of instruction.

The classes in the second year Drawing room were abnormally large and it became necessary to call on the instructors in the laboratory to help out in the drawing rooms.

During the first part of the year six members of the Department, Professors Johnston and Swett, and Messrs. Dole, Peabody, Holmes, and Cowdrey, assisted the Mathematical Department by taking classes in Trigonometry, and Professors Haven and Swett and Mr. Yeaton gave instruction in Drawing of the first year to about one hundred twenty-five men who made use of the fourth year Mechanical Drawing room.

The Gas Engine Laboratory and the Refrigerating Laboratory, both used for military purposes during the war, have been turned back to the Department and effort is being made, during the summer, to get these laboratories into shape for use in the fall when an abnormally large fourth year class is expected.

The Gas Laboratory contained a number of small gas engines and small oil engines which have been taken back to Harvard University. These engines have been replaced by some new equipment; more, however, is needed.

A Galusha gas producer, presented by the manufacturers connected with a Nash gas engine with attached generator, purchased by the Department, has been erected and is now ready for use.

The Refrigerating Laboratory loses a five-ton ammonia compression machine and a three-ton carbonic acid machine, these being the property of Harvard University.

A five-ton Carbondale absorption machine is being installed, however, also brine coolers, ammonia condensers of different types, radiators, and special apparatus for use in experiments on heat transmission.

The large number of students in the various engineering courses, which call on the Mechanical Department for instruction in Mechanism, Drawing, Applied Mechanics, Heat Engineering, Engineering Laboratory, Testing Materials Laboratory and Machine Tool Work, can be taken care of by increasing the teaching staff except in the case of Machine Tool Work, where the number of tools limits the number which can be given instruction at one time. The regular classes taken in sections of thirty (30) (the present limit) call for 54 hours of instruction in a week of

39 hours. The extra classes to be sent here by the Army may, during some terms, bring the total to 66 hours.

To meet this condition the equipment of Machine Tools is being doubled so that sections of 50 to 60 men may receive instruction at the same time.

A demonstration room, capable of seating 95 men, has been fitted up in one end of this laboratory.

To provide space for this extension of the Machine Tool Laboratory, the Pattern Making Laboratory has been moved into the building on Vassar Street where it occupies the space formerly used by the Building and Power Department as a carpenter shop, the space used as a laundry, and also part of the space used as a pipe shop.

An Amsler Laffon compression machine of 1,000,000 pounds capacity, ordered just before the war and shipped from Switzerland just after the armistice was signed, has been erected in the Materials Testing Laboratory.

A Triad furnace No. 1, for use in the Heat Treatment Laboratory, has been presented the Department by the W. R. Bennet Company.

Messrs. A. J. Ferretti, B. R. Cleveland, F. Olson, H. V. du Pont, C. B. Sawyer, C. A. Rogers, D. M. Taylor, and D. A. Fales have resigned from the staff.

The following new appointments have been made:

Assistant Professor Thomas Smith, S.B., M.E., '95, University of Pennsylvania, Mr. A. L. Hamilton, S.B., M. I. T. '18, Mr. H. G. Morse, S.B., M. I. T. '16, Mr. Frederick A. Stearns, S.B., M.I.T. '17, Mr. H. L. Miller, S.B., M. I. T. '18, Mr. C. L. Svenson, S.B., M. I. T. '19, Mr. James M. Holt, S.B., M. I. T. '19, Mr. Elwood M. Manter, S.B., M. I. T. '18, Mr. Robert E. Cheney.

Instructors R. H. Smith and A. L. Holmes have been made assistant professors. Mr. C. H. Clark, who has served for a number of years as a part-time instructor, has been assigned to full-time work.

Professor J. C. Riley, who was given a commission of major in the Signal Corps of the United States Army, at the beginning of the war, has returned from overseas and resumes his work at the Institute in the fall.

Up to September 15, 1919, 806 men from Course II were in active service in either the Army or the Navy; 22 of these men died in service.

The school for training engineer officers for the Merchant Marine, established at Technology by the United States Shipping Board, has run continuously, with the exception of one month, since July, 1917; the total enrollment up to September, 1919, being 954.

EDWARD F. MILLER.

DEPARTMENT OF MINING ENGINEERING AND METALLURGY

Instruction in the academic year 1918-19 has been more or less upset by irregularities due mainly to the war.

The establishment of the Student Army Training Corps in October necessitated radical changes in the courses; in January these courses had to be revised to meet the demands of regular classes which followed after the Student Army Training Corps had been disbanded. The work during the fall term was not satisfactory. The opening of the Institute had to be postponed on account of the prevalence of influenza, and students found it difficult to combine barrack life and military requirements with regularity in class-room attendance and necessary preparation. It is not far from the truth to say that during the Student Army Training Corps period the results attained in the subjects studied were not over two-thirds of the normal.

After the abandonment of the Student Army Training Corps, work was carried during the school year on a modified course. In this period men mustered out from military service who desired to continue their studies were admitted to the regular classes; they received special instruction to make up the parts of the studies they had not had; were allowed to do the missing laboratory work; and were given special examinations.

During the spring term a general revision of the courses became necessary that they might conform to the changes necessitated by the decision of the Institute to divide the academic year into three terms instead of the former two, to strengthen the cultural side, and to harmonize general, scientific, and technical courses in the various departments; in addition the withdrawal of the Harvard co-operating professors from the Institute demanded a rearrangement of the subjects taught in the Department. It is believed that the changes made have greatly strengthened the course. The new permanent schedule will go into effect in full in 1920; transition schedules for 1919 have been prepared. In general, Option No. I retains its former character; the same is the case with Metallurgical Option No. II; Option No. III, which leaned more toward mining while the Institute co-operated with Harvard University, has been restored to its former status as the geological option for mining students. The chief departmental changes involve the transfer of Fire Assaying from the third to the second year; an increase in time to Mining Engineering and Metallurgical Laboratory; a co-ordination of metallurgical studies to avoid repetition of courses for the three options; beginning of Mining Engineering in the second term third year and its exten-

sion into the fourth year; and concentration of Metallurgy into the third year.

The large increase in number of students coming to the Institute has made it necessary to provide additional room for classes and laboratories. With the departure of the Harvard professors the Mining Department has been able to meet in part this need. The greater part of the fourth floor of the mining building has been surrendered for the present to the Chemical Department. This called for the abandonment of the museum and study room and the transfer of specimens and models, of the metallographic and iron and steel laboratories, and of the drafting room to other parts of the building. Metallography is taught in the former museum; heat treatment is carried on in a former research room; drawing and plotting has been assigned to an office which has been vacated; iron and steel and other heavy furnaces have been placed in the laboratories for fire metallurgy. The Department is therefore more crowded than is desirable. It is hoped that with the erection of a chemical building, some of the space relinquished will be restored to its original function. This appears especially desirable in view of the large classes registered for the first and second years, the prospective increase in the number of students, the changes in the mode of instruction which calls for increased use of the mining and metallurgical library by students, and the additional space required for the storage of ores and intermediary products.

In the laboratories there have been received new ores and several new apparatus.

Copper and gold ores have been obtained through the kindness of Mr. A. W. Tucker, class '99, and Professor F. H. Sexton, class '01. A large supply of asbestos board has been presented by Professor C. L. Norton. An Edison mimeograph has been acquired for the preparation of instruction sheets and laboratory reports.

The Mining Laboratory has received a Sullivan mounted Jackhammer drill, a Sullivan rotating Jackhammer drill, an Ingersoll-Sergeant Leyner mounted hammer drill, an Ingersoll-Sergeant rotating Jackhammer drill and an Ingersoll-Sergeant stoping drill. These acquisitions with the apparatus on hand furnish a complete modern drill equipment.

The Ore Dressing Laboratory has been able to install a Campbell magnetic separator through the kindness of Mr. J. B. Etherington; a Jones sampler and three sets of Tyler standard screens have been purchased; storage room has been increased by the erection of tiers to hold ores.

The laboratory for Fire Metallurgy has acquired a complete pyrometric equipment from the Wilson-Maeulen Company for measuring temperatures in the various ore furnaces. New bins

have been placed in the basement for the storage of ores and intermediary products. The Dwight-Lloyd sintering machine noted in last year's report has been tried out, and forms now one of the standard apparatus used regularly in the laboratory exercises.

The laboratory for Wet Metallurgy has acquired acid-proof stoneware crocks of different sizes and shapes in order to permit lixiviation with acids of base metal ores in different quantities. The Oliver Continuous Filter Company of San Francisco has presented to the Department a Standard Test Filter Plate, and a Continuous Filter with suction pump.

The laboratory for Iron and Steel and Metallography has in place gas muffle furnaces, and oil and lead-tempering kettles for the heat treatment of iron and steel. There have been purchased a Leeds and Northrup recorder, a Northrup pyrovolter, two General Electric A. C. ammeters, and two A. C. motors.

The Summer School of Underground Surveying, held the last few years at the Pike Hill mines in Vermont, has been transferred to the mine of the Vermont Copper Company near South Strafford, Vt., as the Pike Hill mine has been shut down. The Department is under great obligation to Mr. N. O. Lawton for the privilege. The school, in charge of Professor J. W. Howard, was attended by 13 men. No Traveling Summer School of Mines and Metallurgy was held. The general curtailment in mining throughout the country made it difficult to place men for summer work, but fortunately friends of the Department offered more openings than we had undergraduate students available; we are especially indebted to Mr. G. A. Joslin, class '09, who took six men.

The number of graduates and former students who entered the war service has reached 169; 10 men died in the service, viz., Orton W. Albee, '93; Malcolm B. Brownlee, Jr., '11; Henry Lamy, '13; Eric W. Mason, '14; August C. Metz, '11; George Roper, Jr., '17; Harold Schaffer, '09; Henry Souther, '87; Albert L. Stephens, '06; and James C. Wooten, '18.

The Class of 1919 was graduated in September, 1918, as noted in last year's report. This would have left the Department without a senior class, had it not been for a number of special, chiefly foreign, students who received instruction in senior subjects. Former students continue to come back from military service to finish their studies. The indications are that we shall have for 1919-20, in the fourth year 12 to 15 men, and in the third year about 25. It is difficult to estimate at present the number of students in the second year; it is, however, safe to count on at least 25 men. In addition, the Department gives instruction to a number of foreign students, mainly from China, Japan and Russia, and to candidates for advanced degrees.

Most of the men who left the Institute went into war service so that we had few recent graduates to place. An unexpected demand for men has developed which we are unable to meet. This demand is for men versed in the properties of metals and alloys and their treatment rather than in their production. It appears to be the outcome of the intense study of metals and alloys during the war, and shows the importance of this branch of metallurgy, represented largely by metallography in the broad sense of the term.

The Central Research Laboratory of the United States Smelting, Refining and Mining Company, established in the Department, suspended operation for a short time during the year. The field of investigation, which was rather broad as shown in last year's report, has been contracted so as to concentrate investigations on problems met in the ore-dressing and metallurgical plants of the company.

Changes in staff have been important. By the dissolution of the co-operative agreement between Harvard University and the Institute, and the establishment of an engineering school at Harvard, Professors H. L. Smyth, A. Sauveur, and G. H. Raymer have severed their connection with the Institute. The official reorganization of the courses of the Department, already noted, was taken in hand shortly after this reduction in staff. Professor C. E. Locke has been promoted from the position of assistant professor of Mining and Metallurgy to that of associate professor of Mining and Ore Dressing.

Because of the small number of students, a condition which the Department shared with all the mining and metallurgical schools of the country when the conditions in Mexico became unsettled, the Department has not had any regular assistants. When necessary, outside help and private assistants have been called in to fill the gaps. With the increased number of students who are entering the third and fourth years, it will be necessary to engage one or more regular assistants to help in the laboratory exercises and other work which has had to be suspended temporarily.

Professional work of the staff has not been as numerous and varied as in the years before the war. Professor Richards has continued his investigations on concentration of certain iron ores in Virginia, and has visited professionally several ore-dressing plants. Professor Hofman has studied the leading zinc plants of the country to familiarize himself with the latest progress that has been made in this branch of metallurgy. Professor Locke has been engaged in the solution of various ore-dressing problems. Professor Bugbee was absent during the first part of last year, having been appointed Assistant District Educational Director of the Student Army Training Corps with headquarters at Raleigh,

North Carolina. He has investigated the cost of smelting certain copper ores for an important copper mining company in Arizona. Professor Hayward has continued his investigation in the treatment of Cuban iron ores; this research, which has taken nearly five years and is now closed, has resulted in the development of an economic process for the recovery of nickel, cobalt, alumina and gypsum, and the production of a desirable iron ore for blast furnace smelting. He is also engaged in developing a method for extracting potash from slate, and a wet process for the recovery of copper from pyrite cinder.

The Department has been favored with several gifts. Professor Richards has continued his donation of the Mining and Scientific Press; the presentations of the Oliver Continuous Filter Company have already been noted; in addition supplies of ore have been received from various sources, and several apparatus already noted.

DEPARTMENT OF ARCHITECTURE

With the coming of the Student Army Training Corps last fall, the course in General Architecture for the time being practically ceased to exist. The Department was represented in the Student Army Training Corps only by the course in Architectural Engineering for which all the American male students in Architecture registered. No formal professional courses were offered during the first period of eleven weeks, but to accommodate a number of women students and others not eligible for service, informal instruction was given in Design, Freehand Drawing, Water Color, Office Practice, History of Architecture, History of European Civilization and Art, and Descriptive Geometry with the understanding that credit would be allowed for the work accomplished, at such time as the Department should return once more to a normal basis. During this first period, ten special students in the second and third years were registered for the work, seven of the number being women.

Fortunately, before the beginning of the second term, the signing of the armistice and the discontinuance of the Student Army Training Corps permitted the Department once more to open its doors to students of both options, and with a necessarily modified schedule, the task was begun of giving as nearly as possible in twenty-two remaining weeks of school the equivalent of a normal year. On the whole, the result was surprisingly satisfactory, due in part to the small number in each class and the consequent close relation between student and instructor.

During the second period, of 11 weeks, 43 students were registered in Course IV, 26 in General Architecture and 17 in Architectural Engineering. In the third period the registration increased to 48, 30 being in General Architecture and 18 in Architectural Engineering.

Fourth year and graduate subjects were not formally offered as the class of 1919 was graduated at the close of the previous summer. Arrangements were made, however, to carry on such instruction in senior work as was needed to complete the further requirements for the degree of 11 fourth year students, the majority of whom had just returned from service to finish the course in Architecture.

The confusion of the year has added much to the burden of the Instructing Staff which, reduced to a minimum, has remained unchanged since the report of last fall. The entire work in Architectural Design has been under the charge of Professors Cram and Gardner.

It is to be regretted that owing to exacting professional interests Professor Cram feels that he must sever his connection

with the Institute as a member of the Faculty. We are most fortunate, however, to have him still connected with the staff as a lecturer, and through his courses in Philosophy of Architecture and in History of Architecture he will continue to bring to the Department his vitalizing energy and personality.

The joint meetings, inaugurated in 1917, of the Instructing Staff of the Harvard School of Architecture, the Architectural Club and this Department have been held frequently during the year. To these meetings have been invited members of the architectural profession. There have been many discussions bearing on architectural education which have not only been helpful to the schools but have served to increase the interest of the profession in what the schools are attempting to do and to bring about a better understanding at least in this locality between the practitioners and the educators.

The Department was represented at the meeting of the Association of Collegiate Schools of Architecture which took place on May 29 at Nashville, Tennessee. The meeting was largely devoted to the consideration of the report of the Committee on Education of the American Institute of Architects. Two principal criticisms of the work of the schools were emphasized. First the lack of adequate preparation needed to make the student of immediate worth in an architect's office after graduation, and second the lack of intelligent co-operation between the profession and the schools. The first of these criticisms can easily be met, at least in a measure, by the schools. It is only a question of proportion, of how far we shall go in training a student as a draftsman, in fitting him to take charge of the office routine, at the expense of the broader fundamental training which is to fit him for an independent career in the profession of architecture. The different schools have answered this question in different ways and the proportion of time devoted to preparation for office routine varies greatly. In our own Department the course in Office Practice is planned to equip the student for this work. In the new schedules just adopted by the Faculty the time devoted to this course has been increased about one-third and I am personally inclined to believe it could be still somewhat further increased to advantage. There is, however, a considerable danger in going too far in this direction and attempting to teach in the school that which a student can only properly acquire through actual practice.

The second criticism referred to is admittedly quite as applicable to the profession as to the schools. We have, in Boston, always been fortunate in the active interest which the profession has taken in our school, and we believe the new plans which have been developed for the instruction in Design for the coming year will do much to refute this criticism. We believe these plans to

contain certain elements which are new and to promise developments of much interest. The instruction in Design has been placed in charge of Professor Gardner and the following special instructors have been appointed to act in association with him.

Mr. Stephen Codman, associate professor in this Department from 1916 to 1918; graduate of Harvard University, with the Class of '90; student at the École des Beaux Arts under Monsieur Blondel, 1889-1893. He was in independent practice from 1894 until 1905, and subsequent to 1905, has been a member of the firm of Codman & Despradelle. He is a member of the American Institute of Architects.

Mr. Edwin S. Dodge, graduate of Harvard, Class of 1895; graduate of the Massachusetts Institute of Technology, Architectural Department, Class of 1897; student at the École des Beaux Arts, 1898 to 1902. He studied in Italy from 1904 until 1912, and has since practised in New York and Boston. He is a member of the American Institute of Architects.

Ralph H. Doane, graduate of the Massachusetts Institute of Technology, Department of Architecture, 1912, where he was known as one of the most brilliant pupils under Professor Despradelle. He came to the Institute from the office of McKim, Meade & White and has had experience in various other leading New York offices. He was consulting architect to the Philippine government, in complete control of all government buildings, parks and city planning, in the towns, provinces, and insular government. He has recently acted as advisor to the mayor of this city on the new Housing Ordinances. At present, he is in practice for himself, associated with C. Howard Walker & Son. He is a member of the American Institute of Architects.

Harry C. Stearns, a student at the Massachusetts Institute of Technology, Department of Architecture, from 1914 to 1917, including two years of advanced design. He was formerly a member of the firm and head designer for Willis Polk, also head designer for the D. H. Burnham Company, in San Francisco. He has studied abroad, working under Monsieur Chifflot in Paris. During the war he was construction officer in the Navy. At present he is engaged in private practice and as a designer for Cram and Ferguson.

We believe all of these men have unusual qualifications for teaching, and their professional training has either directly or indirectly the background of the École des Beaux Arts. They have been selected with the view of organizing a teaching staff which shall have a common understanding of the aims and methods of school training in architecture, which will insure a spirit of co-operation, and which will give to the courses in design a degree of homogeneity and continuity never before realized.

The five instructors associated for a common purpose will

guarantee a breadth of view obtainable in no other way. They will form a committee with regular meetings one evening each week, to discuss matters relating to instruction and to act as a jury to grade and criticise the problems. All of the programs for all grades will be written by one member of the committee. This is a new feature, a most important one, which we believe will insure the correct relations among the programs and produce a more systematic course in design than is usual in American schools. For this particular work Mr. Codman has been selected because of his fitness, experience, and interest. He will in the main confine his services to the writing of the programs and to attending the committee and the jury meetings. Messrs. Dodge and Stearns will alternate in the instruction of the fourth and advanced years and Messrs. Doane and Stearns will deal similarly with the third year. Professor Gardner will take charge of the second year work in which he has been so successful in the past.

Since all of the new instructors will continue the active practice of their profession, we believe we have met, at least in part, the criticism that the schools lack contact with the actual practice of architecture. The new instructors are anticipating their duties with an enthusiasm which presages for the Department a return to the promising outlook which obtained before the outbreak of the war.

We hope to include in this scheme the occasional joint problems with the Harvard School and the Architectural Club which have proved so stimulating both to the students and the instructing staff.

During the present year five prizes have been awarded as follows: the Rotch prize for regular student to W. S. Frazier, Jr.; two Chandler prizes in Grade III both to W. S. Frazier, Jr.; one Chandler prize in Grade II to R. F. Flather; the Class of 1904 prize to W. C. Riley. The Travelling Fellowship in Architecture was not offered.

W. H. LAWRENCE.

DEPARTMENT OF CHEMISTRY AND CHEMICAL ENGINEERING

The outstanding features of the instructional problems of the past year have been the great increase in the size of the first year classes in Chemistry; the absence of senior students because of the completion of the work of the class of 1919 in September last; and the provisions for the reinstatement of former students released from the national service.

On the actual inauguration of the courses for the Student Army Training Corps, preparations for which were in progress at the time of submitting the last report, the entering class was found to number over eight hundred. To provide for these students it was necessary to allow two students to occupy each of the many laboratory desks and to transfer a few to other laboratories where places could be found. The members of the staff who are normally busy with third and fourth year classes co-operated heartily in the first year instruction and the emergency was met with apparent success. The number of students who dropped from the class when the Student Army Training Corps was discharged was closely balanced by those admitted to the Junior Grade first year at the opening of the second period on December 31, and the large total continued until the close of the term in June. A considerable number of students whose work had suffered seriously on account of the necessarily adverse conditions of the first period repeated the work in Chemistry with the Junior Grade students, and the entire group finished the subject, after six weeks of summer work, at the end of August.

The problems involved in the reinstatement of men from the service, returning, as many did, long after the opening of the second term, were nearly all different and individual. Opportunity to take up the work with classes already in progress was granted whenever it seemed possible for the work to be carried successfully and some extra summer courses were offered to meet special needs. A few members of the Class of 1919 who returned were enabled to complete their courses in June, and most of those who left during the third year of their courses will be able to take up the fourth year work at the opening of the next year in October. The omission of the usual senior subjects naturally complicated the situation considerably.

In common with all the courses, those of Chemistry and Chemical Engineering have undergone extensive revision and an adjustment to the new calendar providing for three ten-week terms. No change has been made in the fundamental character or objects of these courses. The decision of the Faculty to regard

Modern Languages as professional subjects has rendered it necessary to somewhat reduce the time devoted to these languages in order not to encroach too seriously upon the more obviously professional requirements, and to permit the same increase in assignments to Political Economy and to General Studies to be made, which have been made in all other courses. The most important changes in the Course in Chemistry are an increase in the time devoted to Mathematics, a reduction of the number of Research Problems from three to two, an increase in the time for optional subjects in the fourth year, and an experiment in supervised study hours in what has been known as "Theoretical Chemistry" and is now to be called "Chemical Principles."

The notable changes in the Course in Chemical Engineering are the introducing of a course in Applied Mathematics, the beginning of Applied Mechanics in the second year, and the transfer of Mechanism to the required summer course.

The five-year course in Chemical Engineering with the School of Chemical Engineering Practice, which was so successfully inaugurated (but necessarily suspended on account of the war), will be re-established with the coming year under the direction of Professor Walker. The schedule is now so arranged that students will complete the four years of the Chemical Engineering Course, as laid down for the degree of Bachelor of Science, and will leave the Cambridge buildings in June of the senior year, remaining in the Practice School until December, when they return to the Institute buildings for twenty weeks of graduate work, in which, as before, there will be full latitude of choice of subjects and research, and on the successful completion of this work the Master's Degree will be awarded.

The number of students electing the courses in Chemical Engineering continues to be unprecedentedly large, and, together with those taking Chemistry, reaches a total which will more than tax our accommodations for the upper classes; and if the first year instruction is to be adequately provided for, additional laboratory accommodations must be provided as early as practicable. New laboratories for the work in Organic Chemistry are being equipped at present, and an emergency laboratory of Industrial Chemistry is being built in one of the buildings formerly used as barracks. Plans for further extensions are under consideration to be developed as early as practicable.

Notwithstanding the release of so many men from war work, the demand for capable men has again outrun the supply. How long this will continue to hold true with the great prospective increase in the size of graduating classes is necessarily a matter for conjecture, but there can be no doubt that the provision of faculties for the training of men for the chemical profession, both for research and for plant operation and control, will be among

the most important opportunities of the Institute for the future.

One of the most notable events of the year is the re-establishment of the Research Laboratory of Applied Chemistry under the directorship of Dr. W. H. Walker, with Professor Robert E. Wilson as assistant director, an account of which is given by the director elsewhere. The renewal of the activities of this laboratory, as a branch of the Department, is of far-reaching importance to the Institute as a whole and to the Department in particular on account of its helpful and stimulatng influence on staff and students.

It is the good fortune of the Department to have again at their posts all of the members of the staff whose absence in national service was noted in the last report, except Captain Smythe, who resigned to enter the technical field. Colonel Walker's service has been recognized by the award of the Distinguished Service Medal, which was also awarded to a graduate from the Department, Colonel Bradley Dewey. Lieutenant-Colonel Norris was assigned to the duty of inspecting the chemical plants in the German territory occupied by the Allied forces, and brings back to us a valuable experience. To attempt to do justice to the achievements of the other members of the staff would far exceed the proper bounds of this report. It is a record in which the Department and the Institute may take great pride.

The instructing staff has been increased by the appointment of Captain William H. McAdams as assistant professor of Chemical Engineering, who comes to us with a record of unusual success in Chemical Warfare Service. He is a graduate from the University of Kentucky with a degree of Master of Science from the Institute. Messrs. Leicester F. Hamilton and Clark S. Robinson have been promoted respectively to assistant professorships in Analytical and Industrial Chemistry on the basis of ability and excellence of service. Major Robert E. Wilson has been promoted from an instructorship to be assistant professor of Chemical Engineering and is now assistant director of the Research Laboratory of Applied Chemistry.

The following junior members of the staff have resigned: C. E. Ruby, Walter T. Hall, J. F Maguire, C. L. Nutting, J. L. Parsons, E. E. Richardson, and C. T. White. The new appointees are: J. B. Barbehenn, L. C. Conner, A. W. Contieri, W. J. Finlay, V. O. Homerburg, C. E. Linscott, E. F. Perkins, P. M. Phillips, C. H. Sorum, Leo Weinberg, and L. W. Weymouth.

Miss Ruth M. Thomas has continued her work as research associate in Organic Chemistry, working under the direction of Professor F. J. Moore, a position which is again made possible through his generosity. Miss Hester S. Lewis has worked during the past year under the direction of Professor A. G. Woodman as research assistant under the Ellen H. Richards Fund. She

has recently resigned and her place is to be filled by Miss Charlotte S. Alling, a graduate of Northwestern University.

The investigation work carried on by Mr. Leighton B. Smith, as du Pont Fellow, has been successfully prosecuted and is referred to in the report of the Research Laboratory of Physical Chemistry. This scholarship has been generously renewed for the next year, to be awarded at the suggestion of the Department.

It is probable that no year in the history of the Department has called for more personal sacrifice or earnest service than the last on the part of the instructing staff and the personnel of the storerooms and laboratories. It is a duty and a pleasure to record my conviction that the service thus rendered by them was truly national and offered in the same spirit as that to which, in the nature of things, greater recognition is accorded.

H. P. TALBOT.

DEPARTMENT OF ELECTRICAL ENGINEERING

The past year has had an inestimable influence on the Department through the effect of the war. The two service flags of the Department, one for students and alumni of Course VI, and the other for the Department staff, respectively carry 557 stars and 14 stars, each signifying a man in the uniform of the Army, Navy or Marine Corps of the United States, and the armies and navies of the Allied nations. The service flags represent but one (the military) out of the four activities counted as "war service" by the editors of "The Book of Technology's War Service"; and if all four war service activities were marked on the flags, substantially all of the Department staff instead of one-half would be represented by stars, and also a large additional number of students and alumni.

This proud record in support of the patriotic sentiment of the Institute we all rejoice in with a rejoicing marred only by the sad evidence of the 18 gold stars on the flag of students and alumni, showing that 18 of them gave up their lives in the military service.

A department as active as the Electrical Engineering Department, which can lose nearly one-half of its staff for a year or more to the military service, and allow opportunities for other members to give time to government affairs or war industries as civilians, and which can continue its duty as a teaching and research unit with unabated zeal and reasonably maintained momentum, as this Department did while so many of us were away on military duty, has proved its sound qualities as no other test could prove them. Extended appreciation belongs to Professor Kennelly for his work as acting head of the Department during my absence overseas in military service, and to Professor Laws for his success in leading the Department while Professor Kennelly was also in Europe, and to all the other members of the staff who remained in the teaching which was so important a part of the nation's preparations for war.

After the hostilities were closed, the calls of the industries for men from our staff were larger than usual and consequently a number of our older men, in addition to the younger ones, have not returned to us. The cancellation of the joint arrangement with Harvard also recalled two professors and half time of a third from our staff. We therefore were, at the end of the last Institute year, short two professors, one associate professor and one assistant professor besides a number of instructors.

Since the Department has as a prime object, service to the engineering industries of the United States, we cannot seriously complain when the industries seek to employ members of our

staff as well as our students. In fact we may assume it to express confidence in the effectiveness of the personnel of our staff. But such procedure of the industrial companies imposes on us the necessity of continually maintaining a body of young men under training as understudies for the older men of the staff. As the work of the Department is large and rather easily subdivided into sections or specialties this is not wasteful of funds or difficult to accomplish; but I again urge the primary importance of making the salaries of these younger men reasonably adequate in order that the most gifted graduates of our course, and also those from other engineering schools, may be attracted toward our positions. With full appreciation of the importance of increased salaries for the older and well established posts in the staff, I wish to doubly emphasize the importance of larger salaries for instructors and the younger men of faculty rank.

Notwithstanding the loss of members of the staff above referred to, we have been fortunate in the new men secured, and in my opinion the Electrical Engineering staff is now stronger than ever before.

The additions to the already strong staff are: Colonel Theodore H. Dillon, appointed professor from the Engineer Corps, United States Army, graduated from West Point in 1904. Professor Dillon has had a varied and responsible engineering practice as well as military experience in the United States Engineer Corps. His duties as electrical engineer of the Panama Canal and some aspects of his duties as deputy chief engineer of our First Army in France were in the branches which he will particularly develop with us, namely, the electrical transmission of power and electric railway projects and practice.

Professor William H. Timbie, appointed associate professor, graduated from Williams College in 1901. He is widely known for his text-books and for his skill in teaching applied science. He will have direction of the details of Course VI-A and his past experience is believed to specially fit him for that undertaking.

Dr. Vannevar Bush received the Master of Science degree from Tufts College in 1913 and the Doctor of Engineering degree from us in 1916. His experience and reputation as a teacher and his mathematical skill promise a notable career. Besides important teaching for the classes in the Principles of Electrical Engineering, Professor Bush will give considerable of his time to the research affairs of the Department, in which he will be a desirable force, particularly as this year only one-half of Professor Kennelly's time is at our service.

Mr. Arthur L. Nelson, Technology 1914, with experience in electric power station design, construction and operation, now lieutenant in the United States Navy; Mr. Frederick Dellenbaugh, Columbia 1910, with experience in the design of electric machinery

and sales engineering for electrical manufacturing companies, recently captain in Signal Corps, United States Army, in France; Mr. H. B. Gardner, Technology 1917, with two years' experience teaching engineering subjects at Virginia Military Institute; Mr. F. B. Philbrick, Technology 1917, since graduation in the employ of the General Electric Company, and Mr. J. W. B. Kennard, Technology 1918, recently lieutenant in the United States Marine Corps service, have been appointed instructors in Electrical Engineering, with special duties provided in harmony with their experience. Mr. C. E. Lansil and Mr. C. E. Tucker have been promoted from the grade of assistant to the grade of instructor. Mr. E. J. Clogher, Technology 1918, and Mr. J. A. Carr, Virginia Military Institute 1919, have been appointed assistants.

The military situation resulted in recalling the Course VI-A men from Lynn in 1918, and those eligible for military duty joined the Student Army Training Corps or the Naval Unit at the Institute. A substantial special course was arranged for these men so that they could graduate in January after having completed a course essentially equivalent on the academic side to Course VI. The Student Army Training Corps interrupted Course VI-A (the co-operative course carried on in association with the works of the General Electric Company) but this important educational project has been re-established this year with various improvements in the arrangements which were suggested by the experience of 1917-18.

Arrangements have been made to facilitate the re-entrance in the Electrical Engineering course of students who left for war service, and for this object special instruction has been made available for students desiring to make up arrearages.

As the joint arrangement of the Institute with Harvard University has been terminated, that part of the Electrical Laboratory equipment belonging to Harvard has been returned to that institution, and it is being replaced in our laboratories by new apparatus.

Most of the young men in the Research Division went into war service during 1918 and the civilian activities of this division were much curtailed. Investigations have continued, however, on artificial electric lines and their relations to power transmission theory, the properties of oscillograph vibrators, skin effect in coils at high frequencies, transient conditions in artificial electric lines, and certain effects in telephone receivers. This division is again getting to its civilian basis and will continue to be a fruitful addition to our means of instruction as well as adding to general knowledge.

The Vail Library is now in a catalogued state and is ready for general use. It has been moved to convenient quarters and is in charge of an experienced librarian ambitious to make of it the

great influence in our educational processes that it merits. I am of the opinion that it will become one of the most important factors in the electrical engineering education of our students.

The publication list of the department is smaller than in most years but it may be remembered that many reports of a military nature have been written by members of the staff, but are not here included.

DUGALD C. JACKSON.

DEPARTMENT OF PHYSICS
(Including Electrochemical Engineering)

Appointments. Mr. N. C. Page, after many years of service as assistant, instructor, and assistant professor, with activities centering about the work in electricity for Sophomores, Juniors and Seniors, was promoted to Associate Professor of Electricity. Mr. D. L. Webster, Ph.D. (Harvard), assistant professor in the University of Michigan, captain, United States Army, widely known for his experimental and theoretical investigations in electromagnetism, particularly with X-Rays, was appointed Assistant Professor of Physics. Assistant Professor H. P. Hollnagel has resigned. A large number of promising young men have been made assistants and instructors.

Professor Thompson spent three or four months in the Research Department of the General Electric Company at Schenectady. Professor Wilson was elected a member of the National Academy of Sciences in the Section of Physics, and foreign, honorary member of the Benares Mathematical Society, India.

Educational. The operation of the Student Army Training Corps resulted in the abbreviation of instruction to Sophomores in mechanics and heat, with a contemplated similar reduction in electricity and optics; the demobilization of the Student Army Training Corps, while not affording a satisfactory opportunity to expand the work in mechanics and heat, did enable the Department to balance that loss by an unusually thorough treatment of electricity and optics.

The action of the Faculty in increasing for the future the past allotment of time to Physics and in distributing the work over the whole of the Freshman and Sophomore years puts the Department in a better position to teach the physics necessary as a foundation for the more technical scientific and engineering education of the upper two years. To meet the situation Professor Goodwin has revised his book on "Precision of Measurements," Professor Franklin has rewritten his texts on Mechanics and on Electricity and Magnetism, Professor Drisko has revised his Exercise-Book, and Professor Page has prepared brief Notes on Computation.

A greatly increased staff has been provided so that the regular Sophomore Course and the new Freshman Course may both be given to the very large classes indicated for next year (1919-20) without any falling off in the effectiveness of instruction.

Research. Despite the fact that the work of the Department has not yet become entirely normalized after the war, a considerable amount of original investigation has been accomplished and the portion already published is listed in the Bibliography.

EDWIN B. WILSON.

DEPARTMENT OF GEOLOGY AND GEOLOGICAL ENGINEERING

The year indicated above covers in part the reconstruction period following the establishment of the Student Army Training Corps arrangement. The year was subdivided into three terms; the first one being practically conducted under the auspices of the Student Army Training Corps, the results of this work were indifferent, and it was found difficult to obtain attention and thorough study. The two last terms proceeded in more normal manner although the conflict, owing to changed schedules, made it difficult in many cases to arrange the studies properly.

The unusual amount of teaching and the pressure of other duties during the past year have made it impossible for members of the staff to give any continuous attention to research work. This has resulted in postponing the completion of several lines of research work which were under way in our laboratories. It is hoped that these will soon be resumed, and the results published before long.

The number of students has increased considerably and the conditions are gradually getting more normal, culminating at the beginning of the present term in the admission of a larger number of students, both advanced and undergraduate.

Instructing Staff. In November, 1918, Professor F. H. Lahee resigned his position to undertake work in the oil fields of Texas. The resignation was accepted with regret as Dr. Lahee has throughout shown himself as a conscientious and excellent teacher and has indirectly brought credit on the Institute by publishing a most efficient handbook on "Field Geology."

Our instructor, Mr. J. G. Barry, was also absent on military duty. This naturally crippled the teaching staff and threw much work on the remaining professors. They were assisted, in part, by Mr. W. F. Jones, special lecturer on Coal and Petroleum, and by Mr. W. L. Dennen, as part-time assistant during the last term.

Course Scheme. The new course scheme for Course XII has been gradually tried out and amended, and finally was accepted by the Faculty in connection with the other courses approved.

Students. The students in Course XII were comparatively few, only three being registered during the two last terms. As to advanced students, there was one candidate for the degree of Doctor of Philosophy, and four special students. During the present year these conditions have changed in a gratifying degree.

Mr. J. G. Barry, who will return at the beginning of the year, is still registered as a candidate for the degree of Doctor of Philosophy.

Collections and Instruments. Many accessions have been received by purchase and donations. Two petrographical microscopes have been purchased, also two microscopes for metallographic work, as well as one new binocular microscope.

Library. The usual accessions of current publications were received by the Departmental Library. During the year, 270 books were taken out from the library, and 20 new books on geological subjects were purchased.

W. LINDGREN.

DEPARTMENT OF ENGLISH AND HISTORY

With the organization of a unit of the Student Army Training Corps at the Institute in September, 1918, the English Department became charged with the duty of conducting the course in War Issues which was required of all first and second year students. On account of the large size of the entering class it was found necessary to call upon members of the Faculty outside the Department for help in conducting sections. Professors F. E. Armstrong, A. A. Blanchard, A. E. Burton, H. R. Kurrelmeyer, E. F. Langley, L. M. Passano, H. W. Shimer, J. O. Sumner, H. P. Talbot, and Mr. Walter Humphreys offered their services and taught most acceptably under adverse conditions. Lectures were also given to the classes by Professors Ralph Adams Cram, Davis R. Dewey, and John O. Sumner of the Institute staff; and by Professor Albert Bushnell Hart of Harvard, Colonel A. W. Chilton of the United States Military Academy, and Mr. James P. Munroe. All of these men responded most patriotically to requests for their assistance, and the Institute returns them hearty thanks for their generous service.

The work of the Educational Reconstruction Committee, of which Professor Robinson was a member, resulted in recommendations vitally affecting the Department. The need of more time for English is a subject which graduates of the Institute had for many years been bringing to the attention of the Department and of the Institute authorities. It was not, however, till the general revision of the curriculum undertaken this year that it was found possible to surmount the difficulties in the way of accomplishing this end. The adoption by the Faculty of the committee's recommendations greatly increases the scope of the work of the Department and makes it possible to give better disciplinary value to the studies. The change in the system of General Studies in the upper years enables the Department to offer a series of attractive options under much better conditions than have prevailed heretofore.

With regard to the combination of instruction in History with that in English, which was in effect as a temporary measure last year, the Educational Reconstruction Committee, acting on the report of the Visiting Committee of the Corporation, presented a program in which the teaching of these subjects in correlation with each other in one Department was permanently provided for. In subject matter the courses, which will cover the first two years and will be required of all students, have been planned to present a survey of the development of social and political institu-

tions since the time of the French Revolution, and of the main currents of thought in the nineteenth century as interpreted by masterpieces of English literature. The instruction is to be given entirely in small sections, in which the freest discussion of the topics under consideration will be carried on under the guidance of the instructor in charge. The written work, which will form an integral part of the entire course, will be based on these discussions and on the student's reading. Thus the student will not be called upon to write till he has ideas which he can express; furthermore, as a result of the class discussions he will be stimulated to put forth his best efforts. The conference system which has proved so valuable in the past will be continued.

In consequence of these changes the title of the Department has been made "Department of English and History" and the staff has been strengthened by the appointment of six instructors in History. The Department now has a better opportunity than ever before to play its part in helping to turn out men with the all-round training and broad point of view which Institute graduates must have if they are to perform all the many-sided duties that the country expects from them as professional men and as citizens.

In the course of the year, members of the Department did war work as follows: Professor Robinson served with the United States Efficiency Bureau; Professor Aydelotte was director of the War Issues Course; Professor Seaver was supply sergeant of H Company, Eleventh Regiment, Massachusetts State Guard. Messrs. Marks and Crosby, who left in June, 1918, in order to enter the army, returned in January, 1919. Mr. Marks, who entered the Department in 1915, has since resigned, as has also Mr. Blood, who came in February of the present year. Both men have contributed materially to the strength of the Department. Appointments for the coming year are as follows: Ralph Morris, A.B., instructor in English; Harold U. Faulkner, Ph.D., Eugene P. Chase, A.B., France Vinton Scholes, A.B., Alexander Baltzly, A.M., Howard W. Boal, A.B., instructors in History.

During the entire year Professor H. W. Shimer of the Department of Geology conducted the work of one section. The success of his teaching gives ground for hope that a similar arrangement may be tried in other years. Such co-operation between departments is from all points of view extremely beneficial.

By special arrangement the Institute had the benefit during the academic year of the presence of Professor Fred P. Emery, who for many years has been head of the Department of English in Dartmouth College. Associated with the Department of English here some thirty years ago, Professor Emery has retained his interest in Technology and in Tech men. This keen interest in the work of the Institute, and his wisdom and skill as a teacher,

made him a welcome and valuable member of the Department. He leaves behind him many new friends, besides those of longer standing, and takes with him the thanks of the Institute of Technology to a sister institution for a gracious instance of academic comity.

HENRY G. PEARSON.

DEPARTMENT OF ECONOMICS AND STATISTICS

The work of this Department was considerably disorganized during the past year owing to the emphasis of instruction upon the more purely scientific and engineering subjects of the curriculum necessitated by the educational plans for Army and Navy service. The teaching in the elementary course in Political Economy for students of the third year was deferred to the second term, and other courses usually given by the Department to the students in Engineering Administration were temporarily discontinued, or concentrated into briefer periods of instruction.

Professor Doten returned at the opening of the second term in March after an absence of a year and a half in government service. He was executive head of the Industrial Service Section of the United States Shipping Board, Emergency Fleet Corporation, until November 1, 1918. This section had general charge of the work of recruiting the labor force for about 150 shipyards, which had approximately 450,000 employees at the time the armistice was signed, as compared with 110,000 in October, 1917. On November 1, 1918, Professor Doten was transferred to the Central Bureau of Planning and Statistics, which had been organized at the request of President Wilson to co-ordinate the work of the great number of government bureaus at Washington which were gathering and compiling information essential to the prosecution of the war. After the armistice was signed this Bureau devoted its attention largely to gathering economic information for the Peace Conference and prepared and forwarded to the President such information as he and members of the Conference required. Professor Doten was in charge of the Statistical Audit Department of this Bureau.

Professor Schell was absent until September 1, of this year, being in the service of the Emergency Fleet Corporation of the United States Shipping Board. During the earlier part of his absence he was engaged in industrial engineering work of the corporation and later he was assistant to the treasurer of the American International Shipbuilding Corporation. In addition to this service he gave instruction in the Employment Management courses sustained by the co-operative effort of Harvard University, the Massachusetts Institute of Technology, and Boston University at Harvard, and also in similar courses given at Columbia University. During the first half of the school year Professor Schell was able to carry on his class at our Institute two days of the week.

Professor Shugrue, in October, 1918, was called to Washington by the Committee on Education and Special Training, in

connection with the Student Army Training Corps. Until the signing of the armistice he was assistant chief in the Business Department. With the demobilizing of the Student Army Training Corps he was attached as a staff accountant, whose function was the settlement of contracts entered into by the War Department and various educational institutions. He continued in this service until the middle of May, 1919, although he resumed his work at our institution on April 1.

Professor Dewey entered the service of the Department of Labor at Washington in August, 1918, as consulting expert of the Section of Economics of the Information and Educational Service, in which he remained until the latter part of December. Professor Dewey also co-operated in the course of Employment Management, giving a series of lectures, more particularly in Statistics, to the three classes successively organized.

Professor Armstrong, during the year, gave instruction in courses in Economics of Corporations at Boston University and delivered a series of fifteen lectures before the Boston Branch of the American Institute of Banking, an association of bank clerks formed to study the problems of banking and to promote their usefulness as bank assistants.

Under these circumstances the work of the Department was somewhat interrupted. Fortunately, however, there has been no permanent break in our staff as all of the members have returned. Owing to the increasing importance of labor problems, particularly during the war, it seems desirable to supplement the time devoted to these matters in the business course in Organization and a new course, Industrial Relations, was given during the second term by Professor Doten. This course will constitute a regular part of the curriculum for the immediate future, taking the place of the course in Transportation which for the time being has been discontinued.

In keeping with the general tendency of the present time and in response to the expressed opinion of a large number of the graduates of the Institute, the course in Political Economy has been expanded from a half year course to a full year's work. An influence contributing to this expansion was the experience of the engineer in the recent war. Economic analysis and organization was seen to be of paramount importance in the work of meeting the industrial demands of this period. The engineer of the immediate future will need the necessary economic training to prepare him for the continuing demands of this nature. The expanded course in Economics at the Institute is a recognition of this fact and an attempt to meet the need which so clearly exists.

The course in Securities and Investments was given as usual with the assistance of the following outside lecturers: F. A. Arnold, "Underwriting Industrial Securities"; George S. Baldwin, "The

Stock Exchange"; Philip Cabot, "The Financing of Public Utilities in New England"; Arthur S. Dewing, "Public Utility Investments"; F. E. Frothingham, "Hydro-Electric Power in New England"; William L. Garrison, "The Work of a Bond House"; J. B. Hardon, "Mining Securities"; Henry J. Horn, "Analysis of Railroad Reports"; Frank Merrill, "Municipal Securities"; E. P. Turner, "Investment Policies of a Trustee"; Robert S. Weeks, "Liberty Bonds."

DAVIS R. DEWEY.

DEPARTMENT OF MODERN LANGUAGES

During the fall term of 1918-1919 courses were given in French and German on the plan of the Student Army Training Corps for military use by Professors Vogel, Langley and Kurrelmeyer to eight sections in French and six sections in German. Each of the above named professors taught in addition one section in the History Course on War Issues.

With the term beginning December 30, 1918, work was again resumed on a more normal basis and we appointed as instructors in Modern Languages for the remainder of the school year, Messrs. F. M. Currier, L. J. Cook, R. M. S. Heffner, J. S. Cuthbertson, and R. R. Cawley, who had all had more or less extensive experience in language teaching.

The maximum enrollment for the year in the different branches was as follows:

There were ninety-six students in Elementary French reciting in four sections; two hundred and fifty students in Intermediate French reciting in twelve sections; fifty-five students in Spanish reciting in two sections. This instruction was assigned to Professor Langley and Messrs. L. J. Cook, J. S. Cuthbertson, and R. R. Cawley. There were also three sections of Intermediate French given to the Junior Freshmen extending through the summer to September 1 by Professor Langley and Mr. L. J. Cook.

There were one hundred and twenty-five in Elementary German divided into six sections; two hundred and eighty-six students in Intermediate German divided into fourteen sections; and one hundred and forty-six students in Advanced German divided into five sections. These sections were assigned to Professors Vogel and Kurrelmeyer and to Messrs. Currier and Heffner. During the past summer until September 1 three sections of Intermediate and one section of Elementary German were given for the junior freshmen by Professors Vogel and Kurrelmeyer. There was no opportunity during the past year for third year options or electives. We hope, however, to offer several during the coming year.

Because of uncertainty in our requirements owing to changes in the distribution of language work among the fifteen different courses, no instructors were appointed in the Department for the coming year.

Professors Vogel and Langley have again served in connection with the College Entrance Examination Board in the reading of German and French papers in New York during June.

FRANK VOGEL.

DEPARTMENT OF MATHEMATICS

The work of the Department during the past year has been conducted under difficulties which have not been peculiar to this Department, but have affected it with exceptional severity. The unprecedented number of students in the first year and the relatively large number in the second made it necessary to provide so many sections that we were compelled to call into co-operation nine members of other Departments in addition to our normal twelve. In most cases the service — which was willingly rendered — amounted to about a moderate fraction of the instructor's full time, but Professor Thompson, of the Department of Physics, gave us full time during the first two terms. The overload was further increased by the adoption of a schedule of four hours per week for the second year, with a view to completing the requirement in March instead of in June. The students admitted to the first year in January, and a good many men returning from service, for whom it was necessary to make supplementary provision, presented substantial difficulties of another character. On the whole the average teaching load of members of the Department was increased by approximately fifteen per cent. It need hardly be pointed out that while such an increase may be willingly assumed under war conditions and borne without undue hardship for a limited time, the reaction on quality of work and possible research would in the long run prove seriously unfavorable.

Members of the Department have shared in the general Faculty activity connected with the work of the Committee on Reconstruction, and a committee of the Department has been earnestly studying the question of the economy of time in the mathematical program and of correlating it as closely as practicable with the new program in Physics. This year, in particular, we have introduced a substantial amount of elementary integral calculus at the end of the first year, using a special pamphlet prepared mainly by Dr. Rutledge. In this first-year calculus little emphasis is placed on theoretical considerations, but a considerable range of problems is attempted and the results have been distinctly valuable.

The coming year we are attempting a still more marked innovation by introducing elementary calculus at the beginning of the first year. The course runs parallel with Plane Trigonometry and presupposes no Analytic Geometry beyond the use of simple graphs in connection with the Algebra. We aim to familiarize the student with the fundamental notions of derivative and of the integral as the limit of a sum as early as possible with the hope

that these will be more freely used in connection with his Physics. At present the work will be based on a printed pamphlet which may later be replaced by a new text-book.

Under the new program there is a net reduction from 210 hours to 180 in the general mathematical requirement for Engineering Courses. In spite of this we hope by careful economy of time to be able to include all that is essential in our previous program and to devote more time and attention than heretofore to applications of the calculus and differential equations to mechanics.

The amount of summer instruction given in this department has been unprecedentedly large, aggregating nearly 800 hours; equivalent to the full time of four instructors for the two months.

The Department has been strengthened this fall by the accession of four instructors: Dr. James S. Taylor (California), Dr. Norbert Wiener (Harvard), Mr. Raymond Douglass (Maine), and Dr. S. D. Zeldin (Clark). One of these replaces Dr. W. H. Wilson, who has accepted an attractive appointment at the University of Iowa. The other three are needed to provide for the large classes anticipated.

The statistics for the principal mathematical classes for the last year are as follows:

In the first term:	*Students*	*Sections*
Trigonometry	770	32
Calculus	480	21
Differential Equations	18	1
In the second term:		
Trigonometry and Analytic Geometry (first year, junior grade)	300	12
Analytic Geometry and Calculus	570	24
Calculus (for students conditioned or returning from military service)	260	5
Calculus (regular second year)	320	15

Graduate and Elective Courses given during the year include the following: Theory of Probability and Method of Least Squares, by Professor Bartlett; Advanced Calculus and Differential Equations, by Professor Woods; Fourier's Series, by Professor Bailey; Applications of Mathematics to Chemistry, by Professor Hitchcock; Graphical and Mechanical Computation, by Professor Lipka: Theory of Functions, by Professor Woods; Analytical Dynamics by Professor Phillips.

The Course in Advanced Calculus and Differential Equations ordinarily given to three to five Naval Constructors and a somewhat larger number of graduate students was this year given to

three sections of Naval Constructors, numbering altogether forty students, and to fifteen others. Three sections were formed, one of them continuing during the summer.

In the summer term there were eleven Junior Grade and one ordinary section in Elementary Calculus; two sections in second-year Calculus (M-21), and two in M-22, all in the early summer. In the late summer there was a section in Trigonometry, and an unprecedented demand for instruction in entrance Solid Geometry and Algebra, necessitating the formation of four sections in each subject.

H. W. TYLER.

RESEARCH LABORATORY OF PHYSICAL CHEMISTRY

During most of the past school year Professors A. A. Noyes and F. G. Keyes have been engaged in war service in Washington and Paris; and in their absence the Laboratory has been under the direction of Professor Duncan MacInnes.

Although the war resulted in some reduction in the number of research assistants and graduate students at work in the Laboratory, yet twelve men carried on researches throughout the school year, and in part during the following summer.

Certain investigations originating from war problems were continued. Among these may be mentioned the research on the formation and decomposition of iron nitride, carried out by Leighton B. Smith, who was appointed to the fellowship established by the duPont de Nemours Company, also researches on certain gas equilibria involved in the synthetic process of producing ammonia, executed by T. Shedlovsky and H. Dedichen.

The research on the determination of the structure of crystals with the aid of X-Rays, supported by a grant from the Carnegie Institution, has been actively prosecuted by Professor MacInnes with the aid of Frank C. Hoyt. Various lines of investigation relating to solutions from the standpoint of the Ionic Theory have also been continued, by J. A. Beattie, C. E. Ruby, Joubert, Ming Chow and Y. L. Yeh, and A. W. Contieri.

The Laboratory opens this fall with excellent promise for the future. Professor Keyes has returned and will take charge of the administration of the Laboratory. He will resume his researches on the continuity of the liquid and gaseous states and will inaugurate certain new ones on the laws of adsorption. Professor MacInnes will have charge of the research problems and theses in Physical Chemistry of undergraduate students, and will continue with the aid of graduate students his investigations now in progress. The additional laboratory space allotted to the Laboratory during the summer will make possible the undertaking of new lines of research, and will provide for an increased number of graduate students and research assistants.

A. A. NOYES.

RESEARCH LABORATORY OF APPLIED CHEMISTRY

Early in 1917 the Laboratory discontinued its work, in order that its staff could enter the government service. The facilities of the Laboratory were placed at the disposal of the War Department, and were effectively used by the Research Division of the Chemical Warfare Service throughout the period of the war.

Upon the cessation of hostilities and the demobilization of the Chemical Warfare Service a number of able men became available, and as many problems of importance were pressing for solution, the Laboratory was reopened on April 1, 1919.

W. K. Lewis was appointed as acting director and R. E. Wilson as assistant director of the Laboratory. C. S. Venable, L. W. Parsons, W. H. McAdams, W. G. Horsch, W. B. Ross, E. W. Fuller, K. E. Bell, and T. M. Knowland, all formerly of the Chemical Warfare Service, were made research associates on the Laboratory staff. S. L. Chisholm and M. A. Youtz were appointed part time research assistants.

In reopening the Laboratory a new plan of co-operation with the industries has been adopted. Formerly, when a problem was undertaken at the request of some industrial concern, it was arranged that the company pay the cost of the investigation, plus a bonus depending upon the successful solution of the problem. This system was found to be unsatisfactory in several respects. It not only made it difficult for this Laboratory to co-operate with the company's laboratories in the solution of a problem, but it also tended to cause the Laboratory to undertake concrete problems with a specific solution, rather than more fundamental studies which would be in the long run of more value to the industry. Under the present method of co-operation the company pays the cost of its research plus an overhead charge which supports approximately an equal amount of "pro bono publico" research along lines of fundamental scientific interest, the results of which are freely published. The expression of appreciation for the helpfulness of work already published from this Laboratory, which continues to come to us, is a strong incentive to an endeavor to enlarge the scope of its usefulness.

An added function of this Laboratory is to guide the thesis work of undergraduate and graduate students, who in many cases undertake some of the minor problems related to the major problem on which some member of the staff is engaged. It is believed that this close contact with experienced men who are devoting their full time to research, and who have access to various indus-

trial plants, will make the student research work of much more value, both to themselves and to science and industry, than has normally been the case in the past.

At the present time the following major problems are being investigated by the Laboratory for industrial organizations:

For the Goodyear Tire and Rubber Company Dr. Lewis, Dr. Venable and Mr. Bell are investigating the mechanism of vulcanization and the function of vulcanizing accelerators. They are attempting to determine the precise function of various compounding ingredients used in rubber, and to improve the present methods of tire manufacture. Several miscellaneous minor problems have already been brought to a satisfactory conclusion.

For the Vacuum Oil Company Dr. Parsons has undertaken a fundamental investigation of the problem of decolorizing oils, which is of great importance in the mineral oil industry. Mr. Ross is making a study of the manufacture of oil barrels with a view to preventing leakage during shipment. This investigation has already resulted in a considerable saving to the company.

For the National Tube Company Mr. Knowland has determined the relative resistance to the flow of liquids offered by new process and old process steel pipe, and is now acquiring some very valuable data on the flow of very viscous liquids through pipes, about which comparatively little is known. Mr. Knowland is also bringing to a successful conclusion a problem on which the Laboratory has previously worked — the elimination of corrosion in hot water supply systems.

For the National Electrolytic Company Dr. Horsch is making a study of certain organic syntheses of scientific as well as commercial importance.

For the Clinton Metallic Paint Company Mr. Atwell is making a thoroughgoing study of the properties of high temperature cements with a view to improving the product.

The Mead Pulp and Paper Company has authorized the Laboratory to secure two research associates to carry on investigations for that company, looking toward the improvement of methods of paper manufacture.

A number of investigations of general scientific interest are also being carried on by the Laboratory, of which the most important are as follows:

Dr. Horsch is completing a very interesting investigation of the electrolytic production of permanganates which was begun in the Chemical Warfare Service. The previous work was done on the production of sodium permanganate, and the present work is designed to apply these results to the production of the potassium salt and also to explain certain very interesting phenomena which were discovered during the previous work. The results of this investigation will be published in the near future.

Mr. E. W. Fuller is working on various possible ways of utilizing the enormous amounts of phosgene which were made available by the war demands. Some new and interesting organic syntheses have been developed, the details of which will shortly be published. Mr. Fuller is also conducting an investigation of the mechanism of the hydrolysis of mustard gas which is already yielding important results and which is to be followed by a similar study of the mechanism of the hydrolysis of fats.

Mr. S. L. Chisholm is working on the utilization of solid absorbing agents for solvent recovery and the perfection of some new analytical methods for the determination of permanganates in the presence of various other oxidizing agents.

Mr. Youtz has successfully completed the difficult synthesis of the intermediate hydrolysis product of mustard gas which was needed in order to verify some of the conclusions indicated by the above-mentioned work on the mechanism of its hydrolysis.

The Laboratory has just been granted increased space on the fourth floor of the mining building, which is now being fitted up. With these additional facilities, an able corps of men at work, and adequate financial support assured, the Laboratory anticipates the most successful year of its history.

WILLIAM H. WALKER,
Director.

SOCIETY OF ARTS

The Free Popular Experimental Science Lectures which were first held by this society in 1917 were continued during the past year. The interest shown in these lectures was at least as great as in the previous seasons, judging not only by the demand for tickets but also by the number of schools from which requests for tickets were received.

The general policy of holding experimental lectures was followed except that one lecturer gave no experiments during his lecture, but provided numerous experiments and demonstrations in the Biological Laboratories of the Institute.

In consultation with representatives of the high and preparatory schools, Tuesday afternoon was first selected for the most available time for the lectures, but during the past season the lectures were held on Friday afternoon without any loss in the attendance.

The first lecture was given in February by Professor Norton of the Physics Department; it was on "Fire and Frost." The lecture was divided into seven topics: Fire; Heat. What is it? How do we get it? What can we do with it? How does it affect us? How can we save it? How can we get rid of it? What will frost do? Many experiments were given from the use of high temperatures to the use of liquid air.

In March, Professor Sedgwick, head of the Department of Biology and Public Health of the Institute, gave a talk on "The World of Life, or Biology and What it is About." He spoke of the world we live in and other worlds, life in the air, earth and sea and the size of living things. He spoke of the chemical basis, the structures and the behavior of living things, besides of the wealth, the haunts, the web, the struggles, and the phases of life. He closed by referring to health and disease. After the lecture in the Biological Laboratories the following demonstrations were exhibited:

Circulation of the Blood in Frog's web. Some Animals that Cause Disease. Animalcules from stagnant water. Beauty in Pond Scums. The Embryo Chick in the Incubating Egg. Brain of a Fish; of a Cat; of a Kitten. The Beating Heart of a dead Frog. Vegetables Dehydrated by a new Process.

In May, Professor Lewis of the Course in Chemical Engineering, who had worked during the war with the Bureau of Mines for the army upon the problems of gas warfare, gave a lecture upon "Gas Warfare" which was illustrated by many articles used during the war. He reviewed the history of gas warfare, and

outlined the development of it. He spoke of the requirements of a toxic gas for use in war, the limitations of the cylinder attack, of gas shells, phosgene, and other gases which were used. He then spoke of masks used to resist the various kinds of gas and the development of both ours and those of the enemy. Smokes and their uses, mustard gas with its vesicant action and persistence were discussed. This led to the discussion of the crisis in the gas defense of the Allies in the spring of 1918. The lecture was ended with the outline of the American effort in chemical warfare and suggestions of its future.

In June, Professor Franklin, of the Department of Physics of the Institute, gave as the last lecture of the series an illustrated talk on "The Electric Current, What it is, and What we can do with it." The lecture began with an elementary discussion of the heating, magnetic, and chemical effects of the current. This led to a discussion of how the study of electricity and magnetism is related to these effects.

The magnetic field was spoken of and lines of force were shown by their effect upon iron filings. He returned to magnetic effect and showed the side push, then discussed electromotive force induced by motion and by growth of magnetism. After speaking of the steady electric current he showed examples of momentary currents, and showed experiments with currents of high voltage.

In order that the pupils attending these lectures might attain the greatest amount of knowledge and pleasure, printed outlines of the lectures were circulated among those present just before each lecture.

While the lectures covered topics of serious nature and frequently were discussed mathematically or with a comprehensive knowledge of science, each of the lectures purposely assumed no knowledge of science on the part of the pupils present. The attention and appreciation on the part of these pupils was most commendable.

WALTER HUMPHREYS,

Secretary.

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Carle R. Hayward. Reviews of *Stahl und Eisen* and *Metall und Erz.* Abstracts for American Chemical Society, 1918 and 1919.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

TREASURER'S REPORT

FOR THE YEAR ENDED JUNE 30, 1919

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, 1919, 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:		
Estate of Maria A. Evans, for Maria A. Evans Fund	$63,180.60	
M. I. T. Alumni, for Equipment	33,053.92	
Estate of Norman H. George, for Norman H. George Fund	30,000 00	
Estate of Richard B. Sewall, for Richard B. Sewall Fund	30,000.00	
Estate of Charles F. Atkinson, for William Parsons Atkinson Fund	12,954.55	
Anonymous for General Purposes	10,000.00	
Estate of William E. Chamberlain, for William E. Chamberlain Fund	3,000.00	
Walker Memorial Fund, balance, for Walker Memorial	2 894.43	
Anonymous, for Grounds	1,600.00	
Estate of F. W. Emery for Equipment	424.50	
E. H. Cox, for Mechanical Engineering Department Equipment	300.00	
		$187,408.00
Gifts for Research (Schedule B-1), Minor Fund Earnings:		
American Telephone and Telegraph Company, for Library Fund	$2,335.82	
American Telephone and Telegraph Company, for Research	2,478.47	
Vacuum Oil Company, for Applied Chemistry	2,500.00	
National Tube Company, for Applied Chemistry	375.00	
		7,689.29
Miscellaneous Gifts:		
General Electric Company, for Course VIa	$3,333.00	
A. F. Bemis, for Salaries	2,000.00	
*E. I. du Pont de Nemours Co., for Scholarships	1,500.00	
Professor F. J. Moore, for Salaries	900.00	
*Estate of Frances E. Weston. for Scholarships	400.00	
Officers of United States Naval Aviation Detachment, for Memorial Tablet	245.00	
Dance Committee of the S. A. T. C., for Books	80.00	
George S. Baldwin, for General Purposes	20.00	
Philip Cabot, for Department of Economics	20.00	
F. E. Frothingham, for Engineering Administration	20.00	
E. P. Turner, for Engineering Administration	20.00	
Company E, S. A. T. C., for Track Athletics	16.23	
		8,554.23
		$203,651.52

*Not carried to Current Income.

The Institute has also received from Mr. Joseph G. Prosser of Chicago, Ill., the gift of a new design 125-horsepower Prosser engine for the Mechanical Engineering Department, and from Major Frank H. Briggs the gift of additional grandstand facilities at the Athletic Field.

Of the above total $203,651.52, the sum of $14,343.52 was given for current expenses or research, and has been carried into the income for the year.

Respectfully submitted,

FRANCIS R. HART,

Treasurer.

November 1, 1919.

SCHEDULE A.

FINANCIAL RESULT OF THE YEAR ENDED JUNE 30, 1919, COMPARED WITH THE PREVIOUS YEAR.

	1918-1919	*1917-1918*
Current Income, Schedule **B-1**	$1,515,457.87	$1,484,181.98
Current Outgo, Schedule **C-1**	1,453,306.99	1,382,350.60
Excess of Income	$62,150.88	$101,831.38
Income transferred to Funds — net	62,498.43	72,012.28
Net Current Income		$29,819.10
Net Deficit	$347.55	

LOSSES AND GAINS DURING YEAR

Gifts for general purposes, Schedule **A**	.....	$10,345.00
Gains and credits, Schedule **S**	$20,422.47	21,320.78
	$20,074.92	$61,484.88
Losses and charges, Schedule **S**	33,317.04	191,715.77
Decrease of Current Surplus	$13,242.12	$130,230.89

SCHEDULE B-1

INCOME

	Regular Courses	*Research and Funds*	*Total*
INCOME FROM STUDENTS:			
Tuition fees	$515,280.60		
Entrance examination fees forfeited	1,960.00		
Locker fees	2,023.72		
Supplies, chemicals, laboratory materials, etc.	31,453.01		
Sale of lecture notes, etc.	712.66		
Registration fees	415.00		
Dormitory rentals (Schedule C-7)	27,427.95		
Walker Memorial	8,105.23		
	$587,378.17		$587,378.17
INCOME FROM INVESTMENTS:			
Endowments for general purposes, Schedule P	$242,117.64	$838.92	
Endowments for scholarship purposes, applied	22,682.50		
Endowments for other designated purposes	36,431.42	127,298.93	
	$301,231.56	$128,137.85	
Other income not applied to funds	11,007.44		
	$312,239.00		
Less:			
Accrued interest on purchases, etc.	11,007.44		
Net, Schedule Q	$301,231.56	$128,137.85	$429,369.41
GRANTS BY NATION AND STATE:			
Annual Grant from Commonwealth of Massachusetts	$100,000.00		
Federal Aid Income from land grant,			
Act 1862	5,598.35		
Act 1890	16,666.67		
	$122,265.02		$122,265.20
GIFTS FOR			
Salaries	$3,353.00		$3,353.00

	Regular courses	*Research and funds*	*Total*
MINOR FUND EARNINGS:			
Total as shown in Schedule **R**.		$8,885.37	$8,885.37
INCOME FROM OTHER SOURCES:			
Interest	$18,659.51		
Huntington Hall	3,500.00		
U. S. S. M. & R. Co.	1,500.00		
Walker Building	8,000.00		
*Dining Service, Walker Memorial (Schedule **C-8**)	323,024.77		
Bursar's Fund reimbursements		595.58	
Summer Camp, 1918	8,927.04		
	$363,611.32	$595.58	$364,206.90
Total income, Schedule **A**	$1,377,839.07	$137,618.80	$1,515,457.87

*Includes income from students in U. S. Government Schools.

SCHEDULE C-1

OUTGO

	Regular courses	*Research and funds*	*Total*
SALARIES OF TEACHERS:			
Professors	$162,399.06	$1,166.66	
Associate Professors	61,113.37		
Assistant Professors	72,275.72	1,041.68	
Instructors	97,718.73		
Lecturers	2,124.16	125.00	
Assistants	28,442.55	10,619.52	
	$424,073.59	$12,952.86	$437,026.45
WAGES ACCESSORY TO TEACHING:			
Stenographers and Assistants	$13,400.82		$13,400.82
DEPARTMENT SUPPLIES AND REPAIRS:			
(Schedule **C-2**):			
Supplies $54,670.52			
Wages 16,965.15	$71,635.67		$71,635.67
ADMINISTRATION AND GENERAL EXPENSE:			
Salaries of officers	$33,160.88		
Salaries of assistants, stenographers, etc.	33,117.94		
Lecture notes	1,144.15		
Advertising and printing (Schedule **C-3**)	12,760.42		
Insurance	8,809.61		
General Expense (Schedule **C-4**)	54,490.08		
War bonus to employees	14,204.25		
	$157,687.33		$157,687.33
OPERATION AND MAINTENANCE OF PLANT:			
Power Plant Operation (Schedule **C-5**)	$165,313.78		
Building service, Salaries	95,386.67	$1,842.97	
Repairs (Schedule **C-6**) viz.:			
Wages $8,215.39			
Stock and expense 5,444.75	13,660.14		
	$274,360.59	$1,842.97	$276,203.56
EXPENSES OF MINOR FUNDS (excluding salaries):			
Total as shown in Schedule **R.**		$5,180.42	$5,180.42
AWARDS:			
Edward Austin Fund awards		$740.00	
Teachers' Fund awards		5,794.96	
Bursar's Fund awards		440.00	
Fellowship awards		1,871.91	
Dormitory awards (Whitney Fund)		236.00	

	Regular courses	*Research and funds*	*Total*
AWARDS—*Continued.*			
Student Tax awards (Whitney Fund)		$1,150.50	
Architectural Prizes		200.00	
		$10,433.37	$10,433.37
PREMIUMS CHARGED OFF:			
General Investments	$5,244.00		
Rogers Memorial Investments	166.00		
Draper Fund Investments	24.00		
Whitney Fund Investments		$107.00	
Cilley Fund Investments		10.00	
Pratt Fund Investments		20.00	
EXPENSES:			
Pratt Naval Architectural Fund		42,655.27	
Chemical Engineering Practice Fund		9.47	
Alumni New Site Fund		350.97	
Edna Dow Cheney Fund		304.80	
Technology Matrons' Teas Fund		94.84	
Ellen H. Richards Fund		115.93	
Cilley Fund		742.47	
Emma Rogers Fund		300.00	
Dormitories (Schedule C-7)	25,072.93		
Summer Camp, 1918	10,243.90		
Dining Service (Schedule C-8)	333,689.28		
United States Government Schools (Special)	12,389.63		
Walker Memorial	10,764.91		
APPROPRIATIONS:			
Physico-Chemical Research Fund	2,500.00		
INTEREST PAID	36,489.22		
SOCIETY OF ARTS. Expenses	444.75		
	$437,028.62	$44,710.75	$481,739.37
Total Outgo, Schedule A	$1,378,186.62	$75,120.37	$1,453,306.99

SCHEDULE C-2

DETAIL OF DEPARTMENTS (Net)

	Expense		Repairs			
	Supplies	*Salaries and wages*	*Stock*	*Wages*	*Total*	*Overdraft*
Aeronautics	$1,810.97	$310.32	$212.25	$14.34	$2,347.88	....
Architecture	1,166.04	75.00	9.94	9.04	1,260.02	....
Biology	1,314.43	172.98	9.89	102.70	1,600.00	$81.05
Chemistry	4,570.23	....	525.57	736.52	5,832.32	....
Chemical Supply Room	14,812.29	8,287.47	70.28	66.50	23,236.54	....
Civil and Sanitary Engineering	1,961.01	....	9.55	11.63	1,982.19	....
Drawing	185.07	....	45.90	94.03	325.00	94.44
*Economics	998.98	391.02	4.55	1.12	1,395.67	....
Electrical Engineering	3,143.09	240.10	164.84	177.12	3,725.15	....
English	481.80	....	1.31	8.29	491.40	....
General Library*	2,942.61	....	96.03	90.18	3,128.82	....
Geology	1,467.97	4.25	2.94	14.58	1,489.74	....
Geology—Special	176.83	....	....	....	176.83	....
Mathematics	167.29	426.00	....	....	593.29	....
Mechanical Engineering	6,575.53	825.40	618.64	980.43	9,000.00	638.67
Military Science	681.34	295.00	10.60	18.70	1,005.64	....
Mining	1,518.02	55.20	346.15	262.40	2,181.77	....
Modern Language	117.22	55.00	.14	1.38	173.74	....
Naval Architecture	1,055.81	988.01	34.46	21.72	2,100.00	238.84
Physical Training Gymnasium	180.35	....	....	....	180.35	....
Physical Training Athletic Field	837.73	1,795.55	112.66	210.14	2,956.08	....
Physics	4,930.23	20.00	243.06	190.38	5,383.67	....
Physics — Special	1,047.89	....	9.03	12.65	1,069.57	....
	$52,142.73	$13,941.30	$2,527.79	$3,023.85	$71,635.67	$1,053.00
Expense items brought down			52,142.73	13,941.30		
			$54,670.52			
Total stocks and supplies				$16,965.15		
Total, Schedule C-1					$71,635.67	
Department overdrafts (Schedule D-2, Current Assets)						$1,053.00

*Including Engineering Administration.

SCHEDULE C-3

DETAIL OF EXPENSE OF PRINTING AND ADVERTISING (Net)

For Administration Offices	$6,225.46
Advertising in Technology Publications and Newspapers	1,217.83
Department of Publicity	290.20
"Catalog" and "President's Report"	2,223.78
Examinations	500.75
Circular of General Information	1,256.50
Directory of Students, etc.	462.50
"Summer Courses" and "Summer Camp" Circulars	360.00
Miscellaneous	223.40
Total, Schedule **C-1**	$12,760.42

SCHEDULE C-4

DETAIL OF ITEMS OF GENERAL EXPENSE (Net)

Administration Expense	$5,267.11
Buildings' and Janitors' Supplies	5,513.08
Express, Freight, Telegrams, etc.	618.35
Fees, Dues, Commissions, etc.	11,920.62
Furniture and Office Equipment	1,497.73
General Office Supplies	594.09
Graduation Expenses, etc.	600.95
Grounds	5,211.17
Ice, Spring Water	1,889.89
Electric Lamps and Fixtures	2,745.04
Neostyle Service	1,364.72
Postage	1,847.39
Traveling Expenses	1,232.47
Telephone Service	8,517.99
Trucking	*409.90
Laundry	4,243.20
Miscellaneous	1,836.18
Total, Schedule **C-1**	$54,490.08

SCHEDULE C-5

DETAIL OF POWER PLANT OPERATION (Net)

Coal	$127,388.02
Water	7,516.85
Gas	1,792.65
Power Plant and Boiler Room Supplies	6,251.08
Repairs	4,810.06
Trucking	3,042.78
Salaries	26,252.37
War Bonus	1,710.81
Repairs to Crane	1,316.32
	$180,080.94
Less Sales of Electricity	14,767.16
Total, Schedule **C-1**	$165,313.78

*Credit

SCHEDULE C-6

DETAIL OF PLANT REPAIRS (Net)

	Labor	*Stock*
Rogers Building, Boston	$1,028.07	$482.91
President's House	658.04	209.49
General Educational Building, Group No. 1	507.59	307.99
General Educational Building, Group No. 2	504.18	69.85
General Educational Building, Group No. 3	1,144.19	676.81
General Educational Building, Group No. 4	704.14	121.88
General Educational Building, Group No. 8	377.91	58.73
General Educational Building, Group No. 10	479.49	123.04
Gas Engine Laboratory	33.03	6.69
General Furniture Repairs	457.42	62.25
Clocks	27.55	.87
Garage	99.27	25.14
Shop Maintenance	2,116.04	141.55
Mechanics Arts Building	78.47	32.79
	$8,215.39	$2,319.99
Undistributed		3,124.76
Total Stock		$5,444.75
Total Labor		8,215.39
Total, Schedule C-I		$13,660.14

SCHEDULE C-7

DORMITORY ACCOUNT (Net)

Income:		
Cash	$28,795.46	
Less Rental Refunds	1,367.51	
Total Income (Schedule B-I)		$27,427.95
Expense:		
Salaries	$6,916.31	
Laundry	601.96	
Heat	4,400.00	
Light and Power	1,500.00	
Water	900.00	
Repairs	1,904.81	
Supplies	1,570.73	
Insurance	356.25	
Trucking, etc.	76.66	
Printing	96.21	
Interest on Mortgage Loan (Whitney Fund)	6,750.00	
Total Expense (Schedule C-1)		25,072.93
Net Income for year		$2,355.02

SCHEDULE C-8

DINING SERVICE ACCOUNT (Net)

Income:		
Cash, Dining Room	$306,953.44	
Cigars and Candy	16,071.33	
Net Income (Schedule **B-1**)		$323,024.77
Expenditures:		
Food	$209,098.68	
Cigars and Candy	13,161.80	
Salaries	82,370.54	
Light, Heat, Power, etc.	7,454.80	
Laundry	3,306.37	
Printing and Advertising	1,457.00	
Flowers, Music	651.25	
Ice, Refrigeration, etc.	5,444.71	
Repairs, Telephone, Trucking	4,888.71	
Administration Expense	850.60	
Dining-room and Kitchen Equipment	3,124.68	
Soap, Cleansers, etc.	1,515.14	
Insurance	365.00	
Net Expense (Schedule **C-1**)		$333,689.28
Net loss for year		$10,664.51

SCHEDULE D

TREASURER'S BALANCE SHEET

1

INVESTMENT ASSETS

Securities and Real Estate, Schedule H	$9,146,602.83
Cash: In banks for Investment, Schedule E	42,692.08
Cash: Advanced (carried down per contra)	357,258.17
Total	$9,546,553.08

2

CURRENT ASSETS

Cash available for general purposes, Schedule E	$224,652.33
Accounts Receivable, Schedule D-1	63,805.14
Student Fees Receivable	1,103.57
Student Deposits Receivable	2,025.75
Unexpired Insurance	11,825.25
Inventories and Advances for 1919-1920, Schedule D-2	58,344.31
Frame Buildings and Equipment—held for sale	45,129.49
Total	$406,885.84

3

EDUCATIONAL PLANT ASSETS

Lands, Buildings and Equipment. Book Values

Total book value at beginning of year (net)	$10,408,411.58
Additions during year	85,128.60
Total Book Value at end of year, Schedule J	$10,493,540.18

M. I. T. ALUMNI FUND. ASSETS

Appropriated for Equipment of New Buildings, Walker Memorial and Dormitories	$555,000.00
Appropriated for 1916 Reunion	19,672.06
Balance, Cash in bank (Schedule E)	27,567.46
Total	$602,239.52

SCHEDULE D

JUNE 30, 1919

1

ENDOWMENT AND OTHER FUNDS

Funds, Schedule Q recapitulation	$9,533,944.22
Minor Funds, Schedule R	12,608.86
Total Funds	$9,546,553.08

2

CURRENT LIABILITIES

Borrowed from Investment Assets	$296,812.80
Accounts Payable	11,760.59
Tuition in advance, 1919-20	11,172.00
Summer Camp, 1919, Fees and Deposits	1,282.43
Summer Camp, Outside Students' Fees	50.00
Entrance Examination Fees	370.00
Students' Deposits payable	4,795.00
Dormitories, Income in advance	1,998.50
Students' deposits outstanding	10,912.66
*Student Tax — 1919-1920	624.43
Alumni New Site Fund	378.10
Gifts, anticipated	1,000.00
United States Government Schools, balance unexpended	1,000.00
Total	$342,156.51
Surplus available for current expense, Schedule S	64,729.33
Total	$406,885.84

3

EDUCATIONAL PLANT AND CAPITAL ACCOUNTS

Endowment for Educational Plant, Schedule K-1	$9,883,094.81
Notes Payable	400,000.00
Mortgage Loan, Dormitories	150,000.00
Borrowed from Investment Assets	60,445.37
Total	$10,493,540.18

M. I. T. ALUMNI FUND

Balance at beginning of year	$568,801.54
Subscriptions and net income for year	33,437.98
Total	$602,239.52

*$350 Student Tax Funds, invested in Liberty Loan, not included in this amount.

SCHEDULE D-1

DETAIL OF ACCOUNTS RECEIVABLE

United States Navy, account Student Naval Training Corps	$25,144.85
Boston University	21,431.00
United States Army, account Provost Guard	4,000.00
Lowell Institute	3,500.00
Lowell School for Industrial Foremen	1,151.90
United States Shipping Board	1,200.00
Federal Board for Vocational Education	833.32
Miscellaneous Accounts	6,544.07
	$63,805.14

SCHEDULE D-2

DETAIL OF INVENTORIES AND ADVANCES FOR 1919-1920

Advanced to Summer Camp, 1919	$1,167.30
Departmental Overdrafts	1,053.00
Inventories—Dining Room	43,321.63
Walker Memorial, Games	345.77
Building and Janitors' Supplies (Estimated)	3,500.00
Office Supplies	1,556.61
Electric Lamps, etc. (Estimated)	1,000.00
Pipe, Valves, Fittings, etc. (Estimated)	4,500.00
Lumber, Hardware, etc. (Estimated)	600.00
Shades, Locks, etc. (Estimated)	300.00
Electrical Equipment (Estimated)	1,000.00
	$58,344.31

SCHEDULE E

CASH RECEIPTS AND DISBURSEMENTS

FOR THE YEAR

Total Cash Receipts (less transfers)	$3,152,830.63
Total Cash Disbursements (less transfers)	2,933,678.80
Excess of Receipts	$219,151.83
Cash balance at beginning of year	75,760.04
Cash balance at end of year	$294,911.87

CASH BALANCE

Cash on deposit at banks:		
For Alumni Fund		$27,567.46
For Investment		42,692.08
For General Purposes	224,137.49	
Cash at office:		224,652.33
For General Purposes	514.84	
Cash balance as above		$294,911.87

SCHEDULE H

SECURITIES: BONDS, STOCKS,

Bonds	*Description of securities*	*Due*	*Balance at beginning of year*
.....	Adirondack Elec. Power Corp. 5%	1962	$920.00
.....	Am. Dock and Improvement Co. 5%	1921	26,170.00
$115,000.00	Am. Tel. & Tel. Co. 4%	1929	114,025.00
.....	Am. Thread Co. 4%	1919	4,931.25
75,000.00	Atch., Topeka & Santa Fe R.R. Co. 4%	1995	72,000.00
75,000.00	Atch., Topeka & Santa Fe R.R. Co. 4½%	1962	73,143.75
.....	Baltimore, City of, 4%	1961	950.00
94,000.00	Baltimore & Ohio R.R. Co. 3½%	1925	86,490.00
.....	Belt R.R. and Stock Yds. Co. 4%	1939	900.00
1,000.00	Beverly, City of, 4%	1919	1,000.00
.....	Blackstone Valley Gas & Elec. Co. 4½%	1919	30,000.00
50,000.00	Blackstone Valley Gas & Elec. Co. 5%	1939	50,217.00
10,000.00	Boston & Northern St. Ry. Co. 4%	1954	9,250.00
.....	Brooklyn Rapid Transit Co. 5%	1918	100,000.00
70,000.00	Brooklyn Rapid Transit Co. 7%	1921	.....
.....	Buffalo, Rochester & Pitts. Ry. Co. 4½%	1921	1,000.00
.....	Business R. E. Trust, Boston, Trustees 4%	1921	950.00
.....	Central Ill. Public Service Co. 5%	1952	880.00
50,000.00	Central Pacific Ry. Co. 4%	1954	40,918.75
.....	Chelsea, City of 4%	1958	1,000.00
93,000.00	Chesapeake & Ohio Ry. Co. 5%	1939	99,928.00
25,000.00	Chesapeake & Potomac Tel. Co. 5%	1943	24,500.00
.....	Chicago, Burlington & Quincy R.R. 4%	1927	1,000.00
.....	Chicago, Burlington & Quincy R.R. 3½%	1949	837.50
48,000.00	Chicago, Burlington & Quincy R.R. 4%	1958	47,307.00
.....	Chicago, Ill., City of, 4%	1924	9,058.00
16,000.00	Chicago, Ill., City of, 4%	1930	16,207.00
50,000.00	Chicago City Railway 5%	1927	49,750.00
50,000.00	Chi. Junc. Rys. and Union Stock Yds. 4%	1940	49,250.00
35,000.00	Chi. Junc. Rys. and Union Stock Yds. 5%	1940	34,743.75
.....	Chi. Mil. & Puget Sound Ry. Co. 4%	1949	895.00
25,000.00	Chi. Mil. & St. Paul Ry. Co. 4%	1934	23,406.25
55,000.00	Chi. Mil. & St. Paul Ry. Co. 5%	2014	56,087.00
.....	Chicago & Northwestern Ry. Co. 4%	1926	1,900.00
100,000.00	Chicago & Northwestern Ry. Co. 4%	1987	96,500.00
65,000.00	Chicago Union Station 4½%	1963	65,467.00
1,500.00	Cincinnati, City of, 4½%	1935	1,623.00
50,000.00	Cincinnati, City of, 4½%	1936	52,795.00
6,500.00	Cincinnati, City of, 4½%	1945	7,226.00
1,000.00	Cincinnati, City of, 4½%	1933	1,027.00
100,000.00	Cleveland Elec. Ill. Co. 5%	1939	101,918.00
25,000.00	Cleveland & Pittsburgh R.R. Co. 4½%	1942	25,684.00
100,000.00	Columbus, Ohio, City of, 4½%	1944	108,552.00
.....	Commonwealth of Massachusetts 3%	1941	2,000.00
.....	Commonwealth of Massachusetts 3½%	1930	2,000.00
.....	Concord & Montreal R. R. Co. 4%	1920	940.00
68,000.00	Cons. Gas, Elec. Light & Power 4½%	1935	63,630.00
50,000.00	Consumers Power Co. 5%	1936	50,000.00
51,000.00	Cumberland Tel. & Tel. Co. 5%	1937	50,305.75
17,000.00	Delaware & Hudson Co. 4%	1943	17,240.00

SCHEDULE H

REAL ESTATE AND MORTGAGES

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	$920.00	.....	.....	$59.72
.....	26,170.00	.....	.....	939.44
.....	.....	$114,025.00	.....	4,600.00
$25.00	4,956.25	.....	.....	219.78
.....	.....	72,000.00	.....	3,000.00
.....	.....	73,143.75	.....	3,375.00
.....	950.00	.....	.....	44.89
.....	.....	86,490.00	.....	3,290.00
.....	900.00	.....	.....	33.67
.....	.....	1,000.00	.....	40.00
.....	30,000.00	.....	.....	1,350.00
.....	11.00	50,206.00	.....	2,500.00
.....	.....	9,250.00	.....	12.00
.....	100,000.00	.....	.....	2,500.00
70,000.00	.....	70,000.00	.....	.....
.....	1,000.00	.....	.....	36.38
.....	950.00	.....	.....	30.33
.....	880.00	.....	.....	52.92
.....	.....	40,918.75	.....	2,000.00
.....	1,000.00	.....	.....	40.56
.....	347.00	99,581.00	.....	4,650.00
.....	.....	24,500.00	.....	1,250.00
.....	1,000.00	.....	.....	34.64
.....	837.50	.....	.....	42.11
.....	.....	47,307.00	.....	1,920.00
.....	9,058.00	.....	.....	262.00
.....	18.00	16,189.00	.....	640.00
.....	.....	49,750.00	.....	2,500.00
.....	.....	49,250.00	.....	2,000.00
.....	.....	34,743.75	.....	1,750.00
.....	895.00	.....	.....	47.64
.....	.....	23,406.25	.....	1,000.00
.....	11.00	56,076.00	.....	2,750.00
.....	1,900.00	.....	.....	92.39
.....	.....	96,500.00	.....	4,000.00
.....	10.00	65,457.00	.....	2,925.00
.....	7.00	1,616.00	.....	67.50
.....	165.00	52,630.00	.....	2,125.00
.....	28.00	7,198.00	.....	292.50
.....	2.00	1,025.00	.....	45.00
.....	96.00	101,822.00	.....	5,000.00
.....	30.00	25,654.00	.....	1,125.00
.....	342.00	108,210.00	.....	4,500.00
.....	2,000.00	.....	.....	66.11
.....	2,000.00	.....	.....	71.67
22.50	962.50	.....	.....	31.22
.....	.....	63,630.00	.....	3,060.00
.....	.....	50,000.00	.....	2,500.00
.....	.....	50,305.75	.....	2,550.00
.....	10.00	17,230.00	.....	680.00

Schedule H. (*Continued.*)

Bonds, shares	*Description of securities*	*Due*	*Balance at beginning of year*
$100,000.00	Delaware & Hudson Co. 5%	1935	$105,927.00
25,000.00	Detroit Edison Co. 5%	1933	25,430.00
50,000.00	Detroit Edison Co. 5%	1940	50,115.00
.....	Dom'n Power & Transmission Co. 5%	1932	910.00
100,000.00	Edison Electric Ill. Co. 5%	1922	101,332.00
17,000.00	Electrical Securities Corp. 5%	1940	16,830.00
1,000.00	Electrical Securities Corp. 5%	1942	990.00
25,000.00	Electrical Securities Corp. 5%	1943	25,000.00
.....	Fall River, City of, 4%	1921	1,000.00
1,000.00	Franklin, Town of, 4%	1921	1,000.00
63,000.00	General Electric Co. 5%	1952	95,033.00
47,000.00	Georgia Ry. & Electric Co. 5%	1932	47,923.00
.....	Grand Rapids, City of, 3½%	1928	29,100.00
.....	Great Britain and Ireland 5%	1918	49,625.00
85,000.00	Great Britain and Ireland 5½%	1937	.....
750.00	Greenfield, Town of, 4%	1919	750.00
.....	Greenfield, Town of, 4%	1920	750.00
68,000.00	Illinois Central R.R. Co. 4%	1951	62,817.50
100,000.00	Illinois Central R.R. Co. 4%	1952	90,500.00
.....	Illinois Central R.R. Co. 3½%	1952	1,570.00
.....	Illinois Central R.R. Co. 4%	1955	875.00
25,000.00	Indianapolis Union Ry. Co. 5%	1965	24,906.25
50,000.00	Interboro Rapid Trans. Co. 5%	1966	49,562.50
.....	Iowa Central Railway 5%	1938	1,000.00
50,000.00	Kansas City, Mo., 4½%	1935	53,801.00
7,000.00	Kan. City, Clinton & Spfd. Ry. Co. 5%	1925	6,289.21
50,000.00	Kan. City, Ft. Scott & Mem. R.R. 6%	1928	53,267.00
8,500.00	Kan. City, Mem. & Birming. R.R. 4%	1934	8,287.50
37,000.00	Kan. City, Mem. & Birming. R.R. 5%	1934	34,225.00
50,000.00	Kan. City Terminal 4%	1960	44,187.50
18,000.00	Kentucky Central Ry. Co. 4%	1987	17,910.00
.....	Lackawanna Steel Co. 5%	1923	927.50
.....	Lake Shore & Mich. So. Ry. Co. 4%	1928	3,000.00
85,000.00	Lake Shore & Mich. So. Ry. Co. 4%	1931	84,087.50
100,000.00	Long Island R.R. Co. 4%	1949	96,137.50
50,000.00	Los Angeles, City of, 4½%	1942	52,941.00
25,000.00	Los Angeles, City of, 4½%	1943	26,122.00
.....	Los Angeles, City of, 4½%	1931	5,232.00
75,000.00	Maine Central Ry. Co. 4⅓%	1935	75,083.00
.....	Maryland, Dela. & Va. Ry. Co. 5%	1955	800.00
100,000.00	Massachusetts Gas. Cos. 4½%	1931	96,812.50
66,000.00	Milwaukee Gas Light Co. 4%	1927	61,932.50
100,000.00	Milwaukee County 4½%	1927	104,631.00
.....	Minneapolis, City of, 4%	1927	48,175.00
.....	Minneapolis, City of, 4½%	1930	10,359.00
.....	Minneapolis, City of, 4½%	1931	20,764.00
.....	Minneapolis, City of, 4½%	1932	20,808.00
50,000.00	Minneapolis Gen. Elec. Co. 5%	1934	50,445.00
100,000.00	Minn., St. Paul & Sault St. Marie 4%	1938	93,425.00
50,000.00	Montreal, City of, Canada 5%	1936	50,000.00

Schedule H. (*Continued.*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	$370.00	$105,557.00	.....	$5,000.00
.....	15.00	25,415.00	.....	1,250.00
.....	5.00	50,110.00	.....	2,500.00
.....	910.00	.....	.....	47.22
.....	444.00	100,888.00	.....	5,000.00
.....	.....	16,830.00	.....	850.00
.....	.....	990.00	.....	50.00
.....	.....	25,000.00	.....	1,250.00
.....	1,000.00	.....	.....	31.22
.....	.....	1,000.00	.....	40.00
.....	30,017.00	65,016.00	.....	3,973.05
.....	71.00	47,852.00	.....	2,350.00
.....	29,100.00	.....	.....	527.92
234.37	49,859.37	.....	.....	951.39
86,331.44	.....	86,331.44	.....	.....
.....	.....	750.00	.....	30.00
.....	750.00	.....	.....	25.42
.....	.....	62,817.50	.....	2,720.00
.....	.....	90,500.00	.....	4,000.00
.....	1,570.00	.....	.....	79.94
.....	875.00	.....	.....	36.31
.....	.....	24,906.25	.....	1,250.00
.....	.....	49,562.50	.....	2,500.00
.....	1,000.00	.....	.....	36.81
.....	237.00	53,564.00	.....	2,250.00
.....	.....	6,289.21	.....	350.00
.....	362.00	52,905.00	.....	3,000.00
.....	.....	8,287.50	.....	340.00
.....	.....	34,225.00	.....	1,850.00
.....	.....	44,187.50	.....	2,000.00
.....	.....	17,910.00	.....	720.00
42.50	970.00	.....	.....	45.83
.....	3,000.00	.....	.....	127.25
.....	.....	84,087.50	.....	3,400.00
.....	.....	96,137.50	.....	4,000.00
.....	128.00	52,813.00	.....	2,250.00
.....	48.00	26,074.00	.....	1,125.00
.....	5,232.00	.....	.....	170.63
.....	5.00	75,078.00	.....	3,375.00
.....	800.00	.....	.....	52.36
.....	.....	96,812.50	.....	4,500.00
.....	.....	61,932.50	.....	2,640.00
.....	462.00	104,169.00	.....	4,500.00
.....	48,175.00	.....	.....	772.22
.....	10,359.00	.....	.....	375.00
.....	20,764.00	.....	.....	750.00
.....	20,808.00	.....	.....	750.00
.....	30.00	50,415.00	.....	2,500.00
.....	.....	93,425.00	.....	4,000.00
.....	.....	50,000 00	.....	2,500.00

Schedule H. (*Continued.*)

Bonds, shares	*Description of securities*	*Due*	*Balance at beginning of year*
.....	Montreal Tramways Co. 5%	1941	$890.00
.....	National Dock Trust 4½%	1940	925.00
$50,000.00	New England Tel. & Tel. Co. 4%	1930	50,238.00
50,000.00	New England Tel. & Tel. Co. 5%	1932	50,863.00
52,000.00	N. Y. C. & H. R.R. Co. 4%	1998	46,046.65
.....	N. Y. C. & H.R. R.R. Co. 3½%	1998	2,905.00
.....	N. Y. C. Lines Equipment 4½%	1919	985.00
36,000.00	N. Y. C. Lines Equipment 5%	1919	34,740.00
.....	N. Y. Central R.R. 6%	1935	2,679.00
40,000.00	New York City 4¼%	1964	41,691.00
100,000.00	N. Y. Connecting R.R. Co. 4½%	1953	98,625.00
31,000.00	N. Y., N. H. & H. R.R. Co. 6%	1948	34,450.00
55,000.00	N. Y. Telephone Co. 4½%	1939	53,130.86
33,000.00	Norfolk, Va., City of, 4%	1954	33,000.00
.....	Northern Me. Seaport R.R. Co. 5%	1935	850.00
159,000.00	Northern Pacific Gt. No. R.R. Co. 4%	1921	155,437.50
75,000.00	Northern Pacific Ry. Co. 4%	1997	67,875.00
50,000.00	Norton Company 5%	1922	50,000.00
.....	Ogdensburg & Lake Champlain Ry. 4%	1948	680.00
25,000.00	Old Colony St. Ry. Co. 4%	1954	22,750.00
50,000.00	Omaha, Neb., City of, 4½%	1934	53,545.00
50,000.00	Omaha, Neb., City of, 4½%	1941	54,355.00
50,000.00	Province of Ontario 5%	1926	50,000.00
84,000.00	Oregon R.R. & Navigation Co. 4%	1946	82,668.25
50,000.00	Oregon Short Line R.R. Co. 4%	1929	48,500.00
14,500.00	Oregon Short Line R.R. Co. 5%	1946	15,301.00
41,000.00	Ottawa, P. Q., City of, 4½%	1930	39,003.30
75,000.00	Pacific Tel. & Tel. Co. 5%	1937	73,915.10
18,000.00	Pennsylvania R.R. Co. 4½%	1960	18,615.00
100,000.00	Pennsylvania R.R. Co. 4½%	1965	101,075.00
117,900.00	Pere Marquette R.R. Co. 5%	1956	104,719.59
50,000.00	Philadelphia, City of, 4%	1947	51,634.00
25,000.00	Portland General Electric Co. 5%	1935	25,436.00
.....	Portland, Ore., City of, 4%	1936	950.00
50,000.00	Portland, Ore., City of, 4½%	1945	50,898.00
50,000.00	Quebec, City of, 5%	1920	49,375.00
1,000.00	Quincy Market Realty Co. 5%	1964	1,000.00
.....	Rensselaer & Saratoga R.R. Co. 7%	1921	26,609.00
51,000.00	Rio Grande Western Ry. Co. 4%	1939	49,935.00
.....	Saginaw, Mich., City of, 3½%	1922	946.25
.....	Saginaw, Mich., City of, 4%	1924	15,000.00
40,000.00	Salt Lake City, Utah, 4½%	1934	41,820.00
15,000.00	San Francisco, City of, 5%	1937	16,241.00
10,000.00	San Francisco, City of, 5%	1939	10,882.00
100,000.00	Savannah, Ga., City of, 4½%	1934/40	105,974.00
19,000.00	Seattle Electric Co. 5%	1929	18,430.00
.....	Seattle Electric Co. 5%	1930	6,203.00
1,000.00	Somerset Ry. Co. 4%	1955	850.00
100,000.00	Southern Bell Tel. & Tel. 5%	1941	101,317.00
45,000.00	Southern Calif. Edison Co. 5%	1939	44,550.00

Schedule H. (*Continued.*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	$890.00	.....	.....	$57.64
.....	925.00	.....	.....	35.00
.....	21.00	$50,217.00	.....	2,000.00
.....	66.00	50,797.00	.....	2,500.00
.....	.....	46,046.65	.....	2,080.00
.....	2,905.00	.....	.....	152.89
$15.00	1,000.00	.....	.....	45.00
.....	.....	34,740.00	.....	1,800.00
.....	2,679.00	.....	.....	135.42
.....	37.00	41,654.00	.....	1,700.00
.....	.....	98,625.00	.....	4,500.00
.....	119.00	34,331.00	.....	1,860.00
.....	.....	53,130.86	.....	2,475.00
.....	.....	33,000.00	.....	1,320.00
.....	850.00	.....	.....	47.78
.....	.....	155,437.50	.....	6,360.00
.....	.....	67,875.00	.....	3,000.00
.....	.....	50,000.00	.....	2,500.00
.....	680.00	.....	.....	45.86
.....	.....	22,750.00	.....	30.00
.....	236.00	53,309.00	.....	2,250.00
.....	198.00	54,157.00	.....	2,250.00
.....	.....	50,000.00	.....	2,500.00
.....	.....	82,668.25	.....	3,360.00
.....	.....	48,500.00	.....	2,000.00
.....	30.00	15,271.00	.....	725.00
.....	.....	39,003.30	.....	1,845.00
.....	.....	73,915.10	.....	3,750.00
.....	15.00	18,600.00	.....	810.00
.....	23.00	101,052.00	.....	4,500.00
.....	.....	104,719.59	.....	5,895.00
.....	58.00	51,576.00	.....	2,000.00
.....	27.00	25,409.00	.....	1,250.00
.....	950.00	.....	.....	46.89
.....	34.00	50,864.00	.....	2,250.00
.....	.....	49,375.00	.....	2,500.00
.....	.....	1,000.00	.....	50.00
.....	26,609.00	.....	.....	665.97
.....	.....	49,935.00	.....	2,040.00
.....	946.25	.....	.....	35.39
.....	15,000.00	.....	.....	336.67
.....	121.00	41,699.00	.....	1,800.00
.....	69.00	16,172.00	.....	750.00
.....	44.00	10,838.00	.....	500.00
.....	353.00	105,621.00	.....	4,500.00
.....	.....	18,430.00	.....	950.00
.....	6,203.00	.....	.....	333.33
.....	.....	850.00	.....	40.00
.....	60.00	101,257.00	.....	5,000.00
.....	.....	44,550.00	.....	2,250.00

Schedule H. (*Continued.*)

Bonds	*Description of securities*	*Due*	*Balance at beginning of year*
$25,000.00	Southern Ry. Co. 4%	1951	$24,875.00
.....	St. Paul, City of, 4½%	1935	25,369.00
50,000.00	St. Paul, City of, 4¼%	1936	52,181.00
.....	Springfield, Mass., City of, 3½%	1926	1,000.00
.....	Toledo, City of, 4½%	1931	1,024.00
100.00	Toledo Terminal R.R. Co. 4½%	1957	825.00
.....	Terminal R.R. Assn. of St. Louis 4%	1953	5,000.00
100,000.00	Terminal R.R. Assn. of St. Louis 4½%	1939	100,341.00
25,000.00	Terre Haute Traction & Light Co. 5%	1944	25,000.00
50,000.00	Toronto, City of, 5%	1932	50,000.00
100,000.00	Union Pacific R.R. Co. 4%	1947	101,062.00
.....	United Fruit Co. 4½%	1923	7,642.50
.....	United Fruit Co. 4½%	1925	26,905.00
200.00	United States of America 3½%	1947	200.00
43,000.00	United States of America 4¼%	1942	43,000.00
420,000.00	United States of America 4¼%	1928	420,000.00
86,000	United States of America 4¾%	1923	.....
.....	U. S. Envelope Co. 5%	1924	1,000.00
98,000.00	U. S. Steel Corp'n 5%	1963	105,294.00
1,000.00	Washington Co. R.R. Co. 3½%	1954	750.00
100,000.00	Western Tel. & Tel. Co. 5%	1932	101,527.00
25,000.00	Western Electric Co. 5%	1922	24,875.00
.....	Western Union Telegraph Co. 4½%	1950	1,860.00
40,000.00	Winnipeg, Man., City of, 5%	1926	39,350.00
50,000.00	Winston-Salem Southbound Ry. 4%	1960	43,875.00
.....	Winthrop, Town of, 4%	1929	1,000.00
588 shares	Alaska Building Trust		.....
.....	American Mfg. Co. Com.		1,176.00
.....	American Mfg. Co. Pfd.		470.00
50 shares	American Tel. & Tel. Co.		6,113.12
80 "	Amoskeag Mfg. Co. Pfd.		7,890.00
46 "	Amoskeag Mfg. Co. Com.		3,266.00
141 "	Batopilas Mining Co.		141.00
.....	Bates Mfg. Co.		536.00
.....	Boston & Lowell R.R. Corp'n		780.00
295 shares	Boston & Albany R.R. Co.		60,911.50
.....	Boston & Maine R.R. Com.		618.00
.....	Boston & Maine R.R. Pfd.		855.00
.....	Boston Ground Rent Trust		897.50
68 shares	Boston Real Estate Trust		71,661.64
.....	Boston Wharf Co.		1,323.00
31 shares	Boston Woven Hose & Rubber Co. Com.		5,812.50
20 "	Boston Woven Hose & Rubber Co. Pfd.		2,340.00
.....	Boylston Market Ass'n.		16,800.00
.....	British Westinghouse Elec. & Mfg. Co. Pfd.		600.00
.....	Calumet & Hecla Mining Co.		5,911.74
.....	Cambridge Gas Light Co.		1,020.50
91 shares	Central Wharf & Wet Dock Corp'n		18,900.00
93 "	Chi., Milwaukee & St. Paul Ry. Co. Pfd.		7,367.00
33 "	Chi., Milwaukee & St. Paul Ry. Co. Com.		3,168.00

Schedule H. (*Continued.*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	.....	$24,875.00	.....	$1,000.00
.....	$25,369.00	.....	.....	809.38
.....	128.00	52,053.00	.....	2,125.00
.....	1,000.00	.....	.....	41.81
.....	1,024.00	.....	.....	45.38
.....	750.00	75.00	.....	40.63
.....	5,000.00	.....	.....	245.42
.....	17.00	100,324.00	.....	4,500.00
.....	.....	25,000.00	.....	1,250.00
.....	.....	50,000.00	.....	2,500.00
.....	38.00	101,024.00	.....	4,000.00
$357.50	8,000.00	.....	.....	361.30
1,095.00	28,000.00	.....	.....	1,263.20
.....	.....	200.00	.....	7.00
.....	.....	43,000.00	.....	1,827.50
.....	.....	420,000.00	.....	15,182.20
86,000.00	.....	86,000.00	.....	297.31
.....	1,000.00	.....	.....	35.69
.....	2,316.00	102,978.00	.....	5,000.00
.....	.....	750.00	.....	35.00
.....	117.00	101,410.00	.....	5,000.00
.....	.....	24,875.00	.....	1,250.00
.....	1,860.00	.....	.....	73.50
.....	.....	39,350.00	.....	2,000.00
.....	.....	43,875.00	.....	2,000.00
.....	1,000.00	.....	.....	47.22
58,800.00	.....	58,800.00	.....	735.00
124.00	1,300.00	.....	.....	80.00
.....	470.00	.....	.....	18.75
.....	.....	6,113.12	.....	400.00
.....	.....	7,890.00	.....	360.00
.....	.....	3,266.00	.....	172.50
.....	.....	141.00	.....	.....
.....	536.00	.....	.....	44.00
.....	780.00	.....	.....	48.00
.....	.....	60,911.50	.....	1,843.75
.....	618.00	.....	.....	.....
34.86	889.86	.....	.....	.....
.....	897.50	.....	.....	25.00
.....	.....	71,661.64	.....	2,720.00
.....	1,323.00	.....	.....	60.00
.....	.....	5,812.50	.....	379.92
.....	.....	2,340.00	.....	120.00
.....	16,800.00	.....	.....	840.00
.....	600.00	.....	.....	55.52
.....	5,911.74	.....	.....	360.00
.....	1,020.50	.....	.....	30.00
.....	.....	18,900.00	.....	728.00
.....	.....	7,367.00	.....	.....
.....	.....	3,168.00	.....	.....

Schedule H. (*Continued.*)

Shares	*Description of securities*	*Balance at beginning of year*
29 shares	Chicago & Northwestern Ry. Co. Com.	$3,733.75
.....	Concord & Montreal R.R.	558.00
40 shares	Congress St. Associates	3,880.00
2 "	Co-operative Publishing Co.	2.00
.....	Copley Sq. Trust Pfd.	686.00
.....	Cordis Mills	560.00
.....	Delaware & Hudson Co.	750.00
.....	Dwight Mfg. Co.	1,600.00
210 shares	Electric Holdings Co. Ltd.	.....
27 "	Essex Co.	3,780.00
152 "	Fitchburg R.R. Co. Pfd.	11,699.00
31 "	Great Falls Mfg. Co.	3,472.00
56 "	Hamilton Woolen Co.	5,390.00
40 "	Hood Rubber Co.	4,720.00
18 "	Illinois Central R.R. Co.	1,890.00
50 "	Lancaster Mills	5,519.00
.....	Lawrence Gas Co.	495.00
.....	Lowell & Andover R.R.	98.00
101 shares	Maine Central R.R. Co.	9,740.00
.....	Merchants Warehouse Co. Pfd.	475.00
250 shares	Nashua Mfg. Co.	32,500.00
3 "	National Grand Bank of Marblehead	324.00
.....	Newburyport Gas & Elec. Co.	1,155.00
36 shares	New Eng. Tel. & Tel. Co.	4,682.97
65 "	N. Y. C. and H. R. R.R. Co.	5,760.63
50 "	N. Y., N. H. & H. R.R. Co.	3,725.00
54 "	Old Colony R.R.	7,290.00
.....	Pemberton Co.	850.00
.....	Pemberton Bldg. Trust	360.00
77 shares	Pepperell Mfg. Co.	6,845.50
.....	Pennsylvania R.R. Co.	440.00
.....	Pere Marquette Ry. Co. Pfd.	440.00
63 shares	Plymouth Cordage Co.	11,970.00
50 "	Pray Building Trust	2,500.00
197 "	Pullman Co.	31,520.00
11 "	Rivett Lathe and Grinder Co. Pfd.	935.00
3 "	Rivett Lathe and Grinder Co. Com.	105.00
50 "	Samson Cordage Co.	5,000.00
.....	State Street Exchange	390.00
25 shares	South Terminal Trust	2,000.00
.....	Tri-Mountain Trust Co.	180.00
20 shares	Union Pacific R.R. Co. Com.	2,635.00
.....	Union Pacific R.R. Co. Pfd.	243.00
300 shares	United Fruit Co.	38,362.50
70 "	Vermont & Massachusetts R.R. Co.	8,680.00
.....	Washington Water Power Co. of Spokane	924.00
6 shares	Western Real Est. Trust	750.00
188 "	Westinghouse Elec. & Mfg. Co. Com.	9,106.54
100 "	Westinghouse Elec. & Mfg. Co. Pfd.	6,393.90
.....	York Mfg. Co.	1,000.00

Schedule H. (*Continued.*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	.....	$3,733.75	.....	$203.00
.....	$558.00	.....	.....	42.00
.....	.....	3,880.00	.....	120.00
.....	.....	2.00	.....	.....
.....	686.00	.....	.....	37.71
.....	560.00	.....	.....	56.00
.....	750.00	.....	.....	22.50
$494.60	2,094.60	.....	.....	150.00
600.00	.....	600.00	.....	17.05
.....	.....	3,780.00	.....	297.00
.....	.....	11,699.00	.....	760.00
.....	.....	3,472.00	.....	372.00
.....	.....	5,390.00	.....	504.00
.....	.....	4,720.00	.....	280.00
.....	.....	1,890.00	.....	126.00
.....	.....	5,519.00	.....	500.00
.....	495.00	.....	.....	21.00
.....	98.00	.....	.....	4.48
.....	.....	9,740.00	.....	606.00
.....	475.00	.....	.....	18.75
.....	.....	32,500.00	.....	4,000.00
.....	.....	324.00	.....	24.00
.....	1,155.00	.....	.....	56.00
.....	.....	4,682.97	.....	252.00
.....	.....	5,760.63	.....	325.00
.....	.....	3,725.00	.....	.....
.....	.....	7,290.00	.....	378.00
49.60	899.60	.....	.....	90.00
.....	360.00	.....	.....	14.00
.....	.....	6,845.50	.....	1,078.00
.....	440.00	.....	.....	18.00
.....	440.00	.....	.....	.....
.....	.....	11,970.00	.....	1,008.00
.....	.....	2,500.00	.....	50.00
.....	.....	31,520.00	.....	1,576.00
.....	.....	935.00	.....	66.00
.....	.....	105.00	.....	18.75
.....	.....	5,000.00	.....	350.00
.....	390.00	.....	.....	11.25
.....	.....	2,000.00	.....	59.37
.....	180.00	.....	.....	9.00
.....	.....	2,635.00	.....	200.00
.....	243.00	.....	.....	12.00
.....	.....	38,362.50	.....	2,700.00
.....	.....	8,680.00	.....	420.00
.....	924.00	.....	.....	44.00
.....	.....	750.00	.....	42.00
.....	.....	9,106.54	.....	658.00
.....	.....	6,393.90	.....	350.00
227.10	1,227.10	.....	.....	80.00

Schedule H. (*Continued.*)

		Due	Balance at beginning of year
MORTGAGE NOTES:			
	E. V. & C. T. Bigelow 5%		$4,500.00
	W. H. Partridge 5%		7,000.00
	Sam'l Carr et al. Trustees 5% (face 125,000)		75,000.00
	Park Square Real Estate Trust Co. 4%		250,000.00
REAL ESTATE:			
	Avon Street Land and Buildings, Equity		60,732.55
	Newbury Street Land and Buildings, Equity		56,763.29
	Franklin Street Land and Buildings, Equity		47,072.03
			$7,757,325.12
INVESTMENTS, W. B. ROGERS MEMORIAL FUND:			
$25,000.00	Atchison, Top. & St. Fe Ry. Co. 4%	1995	$24,470.00
6,000.00	Baltimore & Ohio R.R. Co. 3½%	1925	5,310.00
7,000.00	Chesapeake & Ohio Ry. Co. 5%	1939	7,637.00
1,000.00	Chi., Burl. & Quincy R.R. 4%	1958	1,000.00
40,000.00	Chi. Junc. Rys. & U. Stock Yds. Co. 5%	1940	39,400.00
4,000.00	Cin., Ind., St. Louis & Chi. Ry. 6%	1920	4,000.00
35,000.00	Fort St. Union Depot Co. 4½%	1941	34,825.00
31,000.00	N. Y. C. & H. R. R.R. 4%	1934	30,225.00
1,000.00	Central Lines Equipment 5%	1919	965.00
37,500.00	Pere Marquette Ry. Co. 4%	1956	37,500.00
24,000.00	Rome, Watertown & Ogdensburg R.R. 5%	1922	24,398.00
4,000.00	United Electric Securities Co. 5%	1940	4,030.00
			$213,760.00
INVESTMENTS, EBEN S. DRAPER FUND:			
$20,000.00	Chi., Mil. & St. Paul Ry. Co. 5%	2014	$20,384.00
16,000.00	Georgia Ry. & Elec. Co. 5%	1932	16,240.00
24,000.00	Indianapolis Union Ry. Co. 5%	1965	23,880.00
20,000.00	New York Tel. Co. 4½%	1939	19,395.00
20,000.00	Wilmington City Elec. Co. 5%	1951	19,600.00
			$99,499.00
INVESTMENTS, THOMAS WENDELL BAILEY FUND:			
.....	Swift & Co.		$452.75
5 shares	Swift International Compania		.....
5 "	Libby, McNeil & Libby		.....
	Miscellaneous Oklahoma Properties		352.00
			$804.75
INVESTMENTS, JOY SCHOLARSHIP FUND:			
	Massachusetts Hospital Life Insurance Co.		$5,000.00
INVESTMENTS, SUSAN H. SWETT SCHOLARSHIP FUND:			
	Massachusetts Hospital Life Insurance Co.		10,000.00
INVESTMENTS, RICHARD LEE RUSSEL FELLOWSHIP FUND:			
$2,000.00	Fisk Wharf and Warehouse Trust		1,980.00
INVESTMENTS, JONATHAN WHITNEY FUND:			
.....	American Thread Co. 4%	1919	24,656.25
$25,000.00	Atchison, Topeka & St. Fe Ry. Co. 4½%	1962	24,381.25
35,000.00	Chicago Union Station 4½%	1963	35,251.00
25,000.00	Detroit Edison Co. 5%	1933	25,416.00
25,000.00	Georgia Ry. & Electric Co. 5%	1932	25,542.00

Schedule H. (*Continued.*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest etc.*	*Income received*
.....	.....	$4,500.00	.....	$225.00
.....	.....	7,000.00	.....	350.00
.....	.....	75,000.00	.....	4,500.00
.....	.....	250,000.00	.....	10,000.00
.....	.....	60,732.55	$4,824.99	.....
$5,000.00	.....	61,763.29	5,468.21	6,300.00
4,000.00	.....	51,072.03	416.93	1,264.84
$313,453.47	$594,711.77	$7,476,066.82	$11,007.44	$345,100.25
.....	.....	$24,470.00	.....	$1,000.00
.....	.....	5,310.00	.....	210.00
.....	$31.00	7,606.00	.....	350.00
.....	.....	1,000.00	.....	40.00
.....	.....	39,400.00	.....	2,000.00
.....	.....	4,000.00	.....	240.00
.....	.....	34,825.00	.....	1,575.00
.....	.....	30,225.00	.....	1,240.00
.....	.....	965.00	.....	50.00
.....	.....	37,500.00	.....	1,500.00
.....	133.00	24,265.00	.....	1,200.00
.....	2.00	4,028.00	.....	200.00
.....	$166.00	$213,594.00	.....	$9,605.00
.....	$4.00	$20,380.00	.....	$1,000.00
.....	20.00	16,220.00	.....	800.00
.....	.....	23,880.00	.....	1,200.00
.....	.....	19,395.00	.....	900.00
.....	.....	19,600.00	.....	1,000.00
.....	$24.00	$99,475.00	.....	$4,900.00
$229.18	$681.93	.....	.....	$40.00
75.00	.....	$75.00	.....	12.00
50.00	.....	50.00	.....	2.50
.....	.....	352.00	.....	.....
$354.18	$681.93	$477.00	.....	$54.50
.....	.....	$5,000.00	.....	$225.00
.....	.....	10,000.00	.....	450.00
.....	.....	1,980.00	.....	80.00
$97.50	$24,753.75	.....	.....	638.67
.....	.....	24,381.25	.....	1,125.00
.....	5.00	35,246.00	.....	1,575.00
.....	29.00	25,387.00	.....	1,250.00
.....	41.00	25,501.00	.....	1,250.00

Schedule H. (*Continued.*)

		Due	Balance at beginning of year
JONATHAN WHITNEY FUND—*Continued*:			
$25,000.00	Maine Central Ry. Co. 4½%	1935	$25,027.00
25,000.00	New York City 4¼%	1964	26,166.00
25,000.00	New York Telephone Co. 4½%	1939	24,150.39
.....	St. Paul, City of, 4½%	1935	25,368.00
21,000.00	United Electric Securities Co. 5%	1940	21,086.00
Mortgage Note, M. I. T. Dormitory			150,000.00
			$407,043.89
INVESTMENTS, FRANK HARVEY CILLEY FUND:			
$8,000.00	Electrical Securities Corp. 5%	1940	$7,960.00
10,000.00	New York City 4¼%	1964	10,440.00
5,000.00	St. Louis, Iron Mt. & So. R.R. 4%	1933	4,812.50
40 shares	Boston & Albany R.R. Co.		8,000.00
10 "	Boston & Providence R.R. Corp.		2,500.00
30 "	Edison Elec. Illum. Co.		7,959.00
50 "	Fitchburg R.R. Co. Pfd.		5,000.00
75 "	Massachusetts Gas Cos. Pfd.		6,825.00
50 "	N. Y., N. H. & H. R.R.		4,700.00
25 "	Springfield Ry. Cos. Pfd.		2,125.00
50 "	West End Street Ry. Co. Com.		3,600.00
	South American Properties		1.00
Isabelle Aznive, Mortgage Note			1,600.00
Jacob Levenson, Mortgage Note			2,400.00
Total			$67,922.50
INVESTMENTS, PRATT FUND:			
50 shares	American Linen Co.		$4,000.00
50 "	American Sugar Refining Co. Pfd.		5,900.00
100 "	Beacon Trust Co.		25,000.00
21 "	Border City Mfg. Co.		2,312.77
273 "	Boston Elevated Ry. Co.		17,111.00
45 "	Boston & Albany R.R.		8,010.00
155 "	Cambridge Gas Light Co.		34,875.00
100 "	Copper Range Co.		6,700.00
25 "	Federal Trust Co.		3,450.00
40 "	Fitchburg R.R. Pfd.		3,000.00
25 "	King Phillip Mills		3,500.00
115 "	Lake Copper Co.		1,610.00
78 "	Lincoln Mfg. Co.		7,800.00
50 "	Massachusetts Gas Companies		4,100.00
600 "	Mexican Cons. Mining Co.		600.00
34 "	Old Colony R.R. Co.		4,760.00
86 "	Salem Gas Light Co.		17,200.00
26 "	Tecumseh Mills		3,562.00
200 "	Utah Cons. Mining Co.		2,800.00
25 "	Wamponoag Mills		2,000.00
15 "	West End St. Ry. Co.		1,125.00
100 "	Winona Copper Co.		611.99

Schedule H. (*Continued.*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest, etc.*	*Income received*
.....	$2.00	$25,025.00	.....	$1,125.00
.....	26.00	26,140.00	.....	1,062.50
.....	.....	24,150.39	.....	1,125.00
.....	25,368.00	.....	.....	840.63
.....	4.00	21,082.00	.....	1,050.00
.....	.....	150,000.00	.....	6,750.00
$97.50	$50,228.75	$356,912.64	.....	$17,791.80
.....	.....	$7,960.00	.....	$400.00
.....	$10.00	10,430.00	.....	425.00
.....	.....	4,812.50	.....	200.00
.....	.....	8,000.00	.....	250.00
.....	.....	2,500.00	.....	100.00
.....	.....	7,959.00	.....	360.00
.....	.....	5,000.00	.....	250.00
.....	.....	6,825.00	.....	300.00
.....	.....	4,700.00	.....	.....
.....	.....	2,125.00	.....	100.00
.....	.....	3,600.00	.....	175.00
.....	.....	1.00	.....	.....
.....	.....	1,600.00	.....	96.00
.....	.....	2,400.00	.....	120.00
.....	$10.00	$67,912.50	.....	$2,776.00
.....	.....	$4,000.00	.....	$750.00
.....	.....	5,900.00	.....	350.00
.....	.....	25,000.00	.....	1,500.00
.....	.....	2,312.77	.....	336.00
$1,625.00	.....	18,736.00	.....	814.63
.....	.....	8,010.00	.....	281.25
.....	.....	34,875.00	.....	1,550.00
.....	.....	6,700.00	.....	450.00
.....	.....	3,450.00	.....	200.00
.....	.....	3,000.00	.....	200.00
.....	.....	3,500.00	.....	362.50
.....	.....	1,610.00	.....	.....
.....	.....	7,800.00	.....	1,092.00
.....	.....	4,100.00	.....	200.00
.....	.....	600.00	.....	.....
.....	.....	4,760.00	.....	238.00
.....	.....	17,200.00	.....	688.00
.....	.....	3,562.00	.....	390.00
.....	.....	2,800.00	.....	200.00
.....	.....	2,000.00	.....	375.00
.....	.....	1,125.00	.....	60.00
.....	.....	611.99	.....	.....

Schedule H. (*Continued.*)

		Due	Balance at beginning of year
PRATT FUND — *Continued*			
$15,000.00	Boston, City of, 4%	1924	$15,000.00
20,000.00	Boston, City of, 4%	1935	20,000.00
15,000.00	Commonwealth of Massachusetts 4%	1919	15,000.00
15,000.00	Commonwealth of Massachusetts 4%	1920	15,000.00
5,000.00	Everett, City of, 4%	1921/25	5,000.00
20,000.00	New York City 4¼%	1964	20,880.00
10,000.00	Salem, City of, 4%	1921/24	10,000.00
11,000.00	Salem, City of, 4%	1921/24	11,000.00
.....	Winchester, Town of, 4%	1919	1,000.00
2,000.00	Winchester, Town of, 4%	1919/23	3,000.00
2,000.00	Winchester, Town of, 4%	1918/23	2,000.00
	Deposits in Savings Banks		2,172.11
	Edward W. Fuller, Mortgage Note 4½%		43,000.00
	Eugene F. Sullivan, Mortgage Note 4½%		50,000.00
	Adolph Morse, Mortgage Note 5%		5,000.00
	Catharine R. Walsh, Mortgage Note 5%		15,000.00
	Real Estate, Huntington Ave., Boston		34,100.00
	Real Estate, Huntington Ave., Boston		27,000.00
	Real Estate, Huntington Ave., Boston		26,900.00
	Real Estate, Mass. Ave. and Prospect St., Cambridge		176,000.00
	Real Estate, Prospect St. and Austin St., Cambridge		74,100.00
	Real Estate, Massachusetts Ave., Cambridge		17,500.00
	Real Estate, Massachusetts Ave., Cambridge		90,900.00
	Real Estate, Franklin St., Boston		82,000.00
			$921,579.87

Grand Total, Schedule D	$9,484,915.13

Schedule H. (*Continued.*)

Purchases and charges during year	*Sales and credits during year*	*Balance at end of year*	*Accrued interest etc.*	*Income received*
.....	.....	$15,000.00	.....	$600.00
.....	.....	20,000.00	.....	800.00
.....	.....	15,000.00	.....	600.00
.....	.....	15,000.00	.....	600.00
.....	.....	5,000.00	.....	200.00
.....	$20.00	20,860.00	.....	850.00
.....	.....	10,000.00	.....	400.00
.....	.....	11,000.00	.....	440.00
.....	1,000.00	.....	.....	40.00
.....	1,000.00	2,000.00	.....	120.00
.....	.....	2,000.00	.....	80.00
.....	.....	2,172.11	.....	93.74
.....	.....	43,000.00	.....	1,935.00
.....	.....	50,000.00	.....	3,775.00
.....	5,000.00	.....	.....	231.67
.....	1,000.00	14,000.00	.....	750.00
.....	.....	34,100.00	.....	1,738.94
.....	.....	27,000.00	.....	1,885.27
.....	.....	26,900.00	.....	1,800.56
.....	.....	176,000.00	.....	14,730.80
.....	.....	74,100.00	.....	6,262.20
.....	.....	17,500.00	.....	2,400.00
.....	.....	90,900.00	.....	7,000.00
.....	.....	82,000.00	.....	2,023.74
$1,625.00	$8,020.00	$915,184.87	.....	$59,394.30
$315,530.15	$653,842.45	$9,146,602.83	$11,007.44	$440,376.85

SCHEDULE J

EDUCATIONAL PLANT

Land, Buildings and Equipment

Land, Boylston, Clarendon and Newbury Streets, Boston	$1,500,000.00
Rogers Building, Boylston Street, Boston	200,000.00
Walker Building, Boylston Street, Boston	150,000.00
Land and Improvements, New Technology, Cambridge	1,092,887.47
Main Educational Building Group, Cambridge	4,062,512.26
Mechanic Arts Building, Cambridge	82,381.55
Power Plant (inc. Machinery and Equipment), Cambridge	261,278.63
Educational Equipment, Cambridge	1,587,052.57
Steam and Electrical Distribution System, Cambridge	155,164.59
Gas Engine Laboratory, Cambridge	26,301.88
Service Garage, Cambridge	5,981.54
Athletic Field, Cambridge	19,265.04
Summer Camp, East Machias, Maine	36,081.81
Walker Memorial Building, Cambridge	571,977.58
Walker Memorial Building, Equipment	136,149.23
Dormitories, Cambridge	331,140.49
Dormitories, Equipment	20,707.57
Miscellaneous and Undistributed	254,657.97
Total, June 30, 1919 (Schedule D)	$10,493,540.18

SCHEDULE K-1

PRINCIPAL GIFTS AND APPROPRIATIONS FOR EDUCATIONAL PLANT

Anonymous Donation for New Buildings	$3,500,000.00
Anonymous Donation for Dormitories	100,000.00
T. C. duPont, Donation for Land	500,000.00
T. C. duPont, Donation for Dormitories	100,000.00
T. C. and P. S. duPont, Charles Hayden, for Mining Building	215,000.00
Alumni Fund, Equipment, Dormitories and Walker Memorial	555,000.00
Walker Memorial Fund, for Walker Memorial	167,303.96
Improvement Fund, for Walker Memorial	24,491.04
Appropriation from Emma Rogers' Fund for Dormitories and Equipment	325,000.00
Estate of F. W. Emery, for New Equipment	125,611.30
Appropriation of Lucius Tuttle Fund for New Equipment	50,000.00
Appropriation of Nathaniel Thayer Fund for New Equipment	25,000.00
Appropriation of 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.	1,489,195.59
Total, June 30, 1919 (Schedule D)	$9,883,094.81

SCHEDULE P

ENDOWMENT FUNDS FOR GENERAL PURPOSES

Increases and Decreases of Funds for General Purposes

Invested funds Restricted	*Funds June 29, 1918*	*Investment income*	*Other increases or decreases of funds*	*Expenditure*	*Funds June 30, 1919*
Anonymous Endowment Fund	$2,500,000.00	$112,285.00	.....	$112,285.00	$2,500,000.00
General Endowment Fund	1,527,549.00	68,587.50	.....	68,587.50	1,527,549.00
George Robert Armstrong	5,000.00	224.50	.....	224.50	5,000.00
Charles Choate	33,932.63	1,526.60	.....	1,526.60	33,932.63
Eben S. Draper	100,000.00	4,900.00	.....	4,900.00	100,000.00
Martha Ann Edwards	30,000.00	1,347.50	.....	1,347.50	30,000.00
William Endicott	25,000.00	1,122.75	.....	1,122.75	25,000.00
Jonathan French	25,212.48	1,122.75	.....	1,122.75	25,212.48
James Fund	163,654.21	7,365.10	.....	7,365.10	163,654.21
Katharine B. Lowell	5,000.00	224.50	.....	224.50	5,000.00
Richard Perkins	50,000.00	2,245.50	.....	2,245.50	50,000.00
John W. and Belinda L. Randall	83,452.36	3,727.50	.....	3,727.50	83,452.36
William B. Rogers	250,225.00	9,605.00	.....	9,605.00	250,225.00
Saltonstall Fund	*48,335.24	2,155.70	.....	1,616.78	48,874.16
Samuel E. Sawyer	4,764.40	211.03	.....	211.03	4,764.40
William J. Walker	23,663.59	1,077.85	.....	1,077.85	23,663.59
Albion K. P. Welch	5,000.00	224.50	.....	224.50	5,000.00
Unrestricted					
Sidney Bartlett	10,000.00	449.00	.....	449.00	10,000.00
A. F. Bemis	.....	134.70	$10,000.00	134.70	10,000.00
Stanton Blake	5,000.00	224.50	.....	224.50	5,000.00
Helen Collamore	12,483.97	538.80	.....	538.80	12,483.97
George B. Dorr	49,573.47	.....	.....	49,573.47	.....
Maria A. Evans	.....	718.40	63,180.60	718.40	63,180.60
Caroline L. W. French	100,843.34	4,538.90	.....	4,538.90	100,843.34
Arthur T. Lyman	5,000.00	224.50	.....	224.50	5,000.00
James McGregor	2,500.00	112.25	.....	112.25	2,500.00
Nathaniel C. Nash	10,000.00	449.00	.....	449.00	10,000.00
Frances M. Perkins	16,525.00	763.30	.....	763.30	16,525.00
Emma Rogers	378,077.06	12,350.00	.....	187,350.00	203,077.06
Robert E. Rogers	7,680.77	345.73	.....	345.73	7,680.77
Richard B. Sewall	.....	1,010.45	30,000.00	1,010.45	30,000.00
Seth K. Sweetser	25,061.62	1,122.75	.....	1,122.75	25,061.62
Nathaniel Thayer	25,000.00	.....	.....	25,000.00	.....
Lucius Tuttle	50,000.00	.....	.....	50,000.00	.....
Charles G. Weld	15,000.00	673.50	.....	673.50	15,000.00
Alexander S. Wheeler	30,000.00	1,347.50	.....	1,347.50	30,000.00
	$5,623,534.14	$242,956.56	$103,180.60	$541,991.11	$5,427,680.19

*One-fourth income added to fund.

SCHEDULE Q

ENDOWMENT FUNDS FOR DESIGNED PURPOSES

Increases and Decreases of Funds for Designated Purposes

Invested funds	*Funds June 29, 1918*	*Investment income*	*Other increases or decreases of funds*	*Expenditures*	*Funds June 30, 1919*
FUNDS FOR SALARIES:					
Samuel C. Cobb For General Salaries . . .	$34,000.00	$1,526.60	.....	$1,526.60	$34,000.00
Sarah H. Forbes For General Salaries . . .	500.00	22.45	.....	22.45	500.00
George A. Gardner For General Salaries . . .	20,000.00	898.25	.....	898.25	20,000.00
James Hayward Professorship of Engineering	18,800.00	844.00	.....	844.00	18,800.00
William P. Mason Professorship of Geology .	18,800.00	844.00	.....	844.00	18,800.00
Henry B. Rogers For General Salaries . . .	25,000.00	1,122.75	.....	1,122.75	25,000.00
Nathaniel Thayer Professorship of Physics .	25,000.00	1,122.75	.....	1,122.75	25,000.00
Totals	$142,100.00	$6,380.80	.....	$6,380.80	$142,100.00
FUNDS FOR LIBRARY, READING ROOMS AND GYMNASIUM					
Cilley Fund	$70,684.28	$2,776.00	.....	$752.47	$72,707.81
Charles Lewis Flint Library .	5,000.00	224.50	.....	224.50	5,000.00
William Hall Kerr Library .	2,122.09	89.80	.....	80.00	2,131.89
Arthur Rotch Architectural Library	5,000.00	224.50	.....	224.50	5,000.00
John Hume Tod Fund . . .	2,827.74	112.25	.....	128.43	2,811.56
Technology Matrons' Tea Fund	2,094.84	89.80	.....	94.84	2,089.80
Edna Dow Cheney for Margaret Cheney Reading Room	14,593.30	628.60	.....	1,086.19	14,135.71
Totals	$102,322.25	$4,145.45	.....	$2,590.93	$103,876.77
FUNDS FOR DEPARTMENTS:					
Anonymous — For Chemistry and Physics	$400,000.00	$17,964.00	.....	$17,964.00	$400,000.00
William P. Atkinson	.....	404.10	$12,954.55	404.10	12,954.55
Frank W. Boles Memorial. .	16,428.90	718.40	.....	.....	17,147.30
Samuel Cabot (Industrial Chemistry)	61,986.19	2,245.50	.....	.....	64,231.69
Wm. E. Chamberlain Fund .	3,000.00	202.05	3,000.00	202.05	6,000.00
Chemical Engineering Fund .	292,802.76	13,024.00	16.90	1,318.03	304,525.63
Susan E. Dorr Fund	95,955.67	4,311.40	.....	4,311.40	95,955.67
George H. May Chem. Dept.	5,000.00	224.50	.....	224.50	5,000.00
Pratt Naval Arch. Fund . .	942,053.79	59,394.30	582.05	43,257.32	958,772.82
Arthur Rotch Architectural Fund	25,000.00	1,122.75	.....	1,122.75	25,000.00
Edmund K. Turner Fund .	*207,163.19	8,982.00	.....	7,251.50	208,893.69
Totals	$2,049,390.50	$108,593.00	$16,553.50	$76,055.65	$2,098,481.35

*One-fourth net income added to fund.

Schedule Q. (*Continued.*)

Invested funds	*Other Funds June 29, 1918*	*Investment income*	*Other increases or decreases of funds*	*Expenditures*	*Funds June 30, 1919*
FUNDS FOR RESEARCH:					
Ellen H. Richards Research Fund	$15,890.41	$673.50	.....	$715.93	$15,847.98
Charlotte B. Richardson (Industrial Chemistry)	37,378.78	1,347.50	.....	1,347.50	37,378.78
Whitney Fund	40,878.62	1,796.50	.....	1,002.50	41,672.62
Totals	$94,147.81	$3,817.50	.....	$3,065.93	$94,899.38
FUNDS FOR FELLOWSHIPS:					
Collamore Fund	$10,996.70	$449.00	.....	.....	$11,445.70
Dalton Graduate Chemical	5,776.84	224.50	.....	$240.00	5,761.34
Moore Fund	5,718.12	224.50	.....	.....	5,942.62
Willard B. Perkins	8,419.59	269.40	.....	.....	8,688.99
Clifford Richardson	171.91	.....	.....	171.91	.....
Richard L. Russel	2,426.57	80.00	.....	90.00	2,416.57
Henry Saltonstall	10,839.93	449.00	.....	470.00	10,818.93
James Savage	14,382.54	449.00	.....	475.00	14,356.54
Susan H. Swett	10,920.45	450.00	.....	425.00	10,945.45
Totals	$69,652.65	$2,595.40	.....	$1,871.91	$70,376.14
FUNDS FOR SCHOLARSHIPS					
Elisha Atkins	$5,367.47	$224.50	.....	$225.00	$5,366.97
Billings Student Fund	52,624.70	2,245.50	.....	2,200.00	52,670.20
Jonathan Bourne	10,526.41	449.00	.....	450.00	10,525.41
Lucius Clapp	5,279.30	224.50	.....	225.00	5,278.80
Lucretia Crocker	55,002.65	2,335.30	.....	505.00	56,832.95
Isaac W. Danforth	5,433.73	224.50	.....	225.00	5,433.23
Ann White Dickinson	42,759.68	1,886.30	.....	1,800.00	42,845.98
du Pont Scholarship	.....	.....	$1,500.00	750.00	750.00
Farnsworth Fund	5,417.47	224.50	.....	225.00	5,416.97
Charles Lewis Flint	5,484.98	224.50	.....	225.00	5,484.48
Sarah S. Forbes	3,577.82	134.70	.....	135.00	3,577.52
George Hollingsworth	5,284.75	224.50	.....	200.00	5,309.25
T. Sterry Hunt	3,256.48	134.70	.....	135.00	3,256.18
William F. Huntington	5,442.57	224.50	.....	225.00	5,442.07
Joy Scholarships	10,000.00	449.50	.....	449.50	10,000.00
Income Joy Scholarships	4,020.34	.....	449.50	125.00	4,344.84
William Litchfield	5,458.47	224.50	.....	225.00	5,457.97
Elisha T. Loring	5,468.26	224.50	.....	225.00	5,467.76
George H. May	4,871.67	224.50	.....	.....	5,096.17
James H. Mirrlees	3,047.86	134.70	.....	125.00	3,057.56
Nichols Fund	5,417.47	224.50	.....	225.00	5,416.97
Charles C. Nichols	5,458.76	224.50	.....	225.00	5,458.26
John Felt Osgood	5,408.47	224.50	.....	225.00	5,407.97
Richard Perkins	56,597.07	2,470.00	.....	2,500.00	56,567.07
Edward D. Peters	250.00	.....	.....	250.00	.....
Thomas Sherwin	5,467.47	224.50	.....	225.00	5,466.97
Susan Upham	1,069.17	44.90	.....	40.00	1,074.07
Ann White Vose	65,913.55	2,919.00	.....	2,800.00	66,032.55
Louis Weissbein	4,190.56	179.60	.....	180.00	4,190.16
Frances Erving Weston	1,110.00	.....	200.00	.....	1,310.00
Samuel Martin Weston	200.00	.....	200.00	200.00	200.00
Totals	$389,407.13	$16,526.20	$2,349.50	$15,544.50	$392,738.33

Schedule Q. (*Continued.*)

Invested funds	*Funds June 29, 1918*	*Investment income*	*Other increases or decreases of funds*	*Expenditures*	*Funds June 30, 1919*
FUNDS FOR PRIZES:					
Arthur Rotch Prize Fund in Architecture	$5,407.47	$224.50	.....	$200.00	$5,431.97
Arthur Rotch "Special" Prize Fund in Architecture	6,007.47	224.50	.....	.....	6,231.97
Totals	$11,414.94	$449.00	.....	$200.00	$11.663.94
FUNDS FOR RELIEF:					
Architectural Society	$1,328.22	$44.90	.....	.....	$1,373.12
Edward Austin	402,562.95	17,290.50	.....	$8,077.50	411,775.95
Thomas Wendall Bailey	2,554.81	54.50	.....	.....	2,609.31
Levi Boles	11,169.70	449.00	.....	.....	11,618.70
Bursar's Fund	6,803.63	281.10	$595.58	440.00	7,240.31
Norman H. George	.....	224.50	30,000.00	.....	30,224.50
Teachers' Fund	120,725.99	4,491.00	.....	5,794.96	119,422.03
Jonathan Whitney	515,656.04	17,791.80	.....	2,493.50	530,954.34
Morrill Wyman	73,631.66	3,278.20	.....	.....	76,909.86
Totals	$1,134,433.00	$43,905.50	$30,595.58	$16,805.96	$1,192,128.12
Funds for General Purposes	$5,623,534.14	$242,956.56	$103,180.60	$541,991.11	$5,427,680.19
Funds for Salaries	142,100.00	6,380.80	.....	6,380.80	142,100.00
Funds for Libraries, Reading Rooms and Gymnasiums	102,322.25	4,145.45	.....	2,590.93	103,876.77
Funds for Departments	2,049,390.50	108,593.00	16,553.50	76,055.65	2,098,481.35
Funds for Research	94,147.81	3,817.50	.....	3,065.93	94,899.38
Funds for Fellowships	69,652.65	2,595.40	.....	1,871.91	70,376.14
Funds for Scholarships	389,407.13	16,526.20	2,349.50	15,544.50	392,738.33
Funds for Prizes	11,414.94	449.00	.....	200.00	11,663.94
Funds for Relief	1,134,433.00	43,905.50	30,595.58	16,805.96	1,192,128.12
Grand Total	$9,616,402.42	$429,369.41	$152,679.18	$664,506.79	$9,533,944.22

SCHEDULE R.

INCREASES AND DECREASES OF MINOR FUNDS.

MINOR FUNDS:	*Funds June 29, 1918*	*Income*	*Other Increases*	*Expenditures Salaries*	*Expenditures Other*	*Funds June 30, 1919*
American Tel. & Tel. Research Fund	$1,593.73	$2,478.47	.....	$2,412.05	$343.52	$1,316.63
American Tel. & Tel. Library Fund	379.75	2,335.82	.....	999.96	1,187.52	528.09
Commercial Research Fund	7.52	.....	.....	.....	.....	7.52
Course XV Fund	98.80	.....	.....	.....	.....	98.80
Dormitory Fund	2,801.10	56.00	.....	.....	.....	2,857.10
Electric Railway Traffic Research Fund	1,745.09	.....	.....	.....	100.00	1,645.09
Jacques Fund	787.79	15.74	.....	.....	.....	803.53
Letter Box Fund	135.26	2.70	.....	.....	.....	137.96
Macy Research Fund	2.37	.....	.....	.....	.....	2.37
Ozone Fund	14.18	.....	.....	.....	.....	14.18
Physico-Chemical Research Fund	*128.40	.....	†2,500.00	1,007.44	956.49	407.67
President's Fund	1,013.74	.....	.....	.....	.....	1,013.74
Research Laboratory of Applied Chemistry	3,852.25	3,949.50	§1,200.00	5,250.83	2,591.66	1,159.26
Research Laboratory of Organic Chemistry	1,711.31	34.22	.....	.....	.....	1,745.53
Roentgen Ray Experiment Fund	646.54	12.92	.....	.....	.....	659.46
Sanitary Research Fund	*410.02	.....	2.00	147.50	1.23	*556.75
Traveling Scholarship in Architecture	750.00	.....	.....	.....	.....	750.00
Vehicle Research Fund	18.68	.....	.....	.....	.....	18.68
	$15,019.69	$8,885.37	$3,702.00	$9,817.78	$5,180.42	$12,608.86

*Overdraft.
†Appropriation from Current Income.
§ Appropriation from Richardson Fund.

SCHEDULE S

CURRENT SURPLUS

Balance, July 1, 1918	$77,971.45
Net decrease, Schedule A	13,242.12
Balance, June 30, 1919, Schedule D	$64,729.33

Details of Losses and Gains, etc.

LOSSES AND CHARGES:

Payment a/c 1917-18	$176.50
Accounts Receivable — charged off	275.52
Students' Fees Receivable — charged off	942.00
Students' Deposits Receivable — charged off	389.73
Losses on sales of Bonds	31,533.29
Total, Schedule A	$33,317.04

GAINS AND CREDITS:

Gains on sales of Bonds	$18,048.71
Collections a/c 1916-1917	61.54
Students' Deposits a/c 1917-1918	2,312.22
Total, Schedule A	$20,422.47

84 State Street, Boston

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

Gentlemen:

We hereby certify that we have examined the books and have audited the accounts of the Treasurer and Bursar of the Massachusetts Institute of Technology for the year ended June 30, 1919.

We have established the assets and liabilities of the Institute as set forth on the balance-sheet of the printed report of the Treasurer, including a comparison of the detail list of securities with the certified list furnished by the Old Colony Trust Company, but we have not made a physical inventory of the securities themselves.

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

We have verified the details of the bookkeeping during the year, have examined the vouchers for disbursements and have satisfied ourselves that all receipts of money have been acknowledged on the books and deposited in the bank and that the cash balances shown by the books on June 30, 1919, were actually available and that these balances are correct.

Very respectfully.

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

4-20-1500-T.P.