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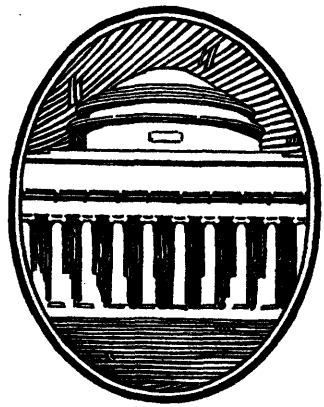

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President's Report Issue

1934–1935

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REPORT OF THE PRESIDENT

TO THE MEMBERS OF THE CORPORATION:

It is my duty and pleasure at this time to submit a report on the Massachusetts Institute of Technology for the past year, describing its operations, analyzing its present situation and pointing out those aspects of its work and needs which in my judgment deserve particular and constructive attention.

In general terms it may be said with assurance and satisfaction that the Institute is in a healthy state, sound financially, effective educationally, productive in creative work, active in service to the public, and imbued with a spirit of enthusiasm and coöperation which is the strongest guarantee of future effectiveness. In this statement I believe that your Visiting Committees, which have made intensive studies of particular phases of our work, will concur. They will also agree with my next statement, that there are many directions in which our work can be improved.

The significant details of our operations and some mention of our needs are presented in the appended individual reports of other administrative officers of the Institute. It will be my purpose to summarize some of the more significant features of these reports and then to discuss certain general matters concerning our educational philosophy which may serve as guiding principles for our future efforts.

PERSONNEL

The Corporation suffered great loss in the death on December 6, 1934 of Dr. Allan Winter Rowe, and on August 1, 1935 of Dr. Arthur D. Little. Both men have served the Institute long and effectively. Both have served as President of our Alumni Association, and both have left a lasting imprint on the spirit and the organization of the institution. Dr. Rowe's chief interest was in student welfare, with particular reference to athletics, for which he was a fearless champion. He had served as Term Member of the Corporation since June 1933. Dr. Little's great interest in the Institute had been centered

around the development of the educational programs and laboratory facilities in Chemistry and Chemical Engineering, and the work of the Division of Industrial Coöperation. Through the terms of his will he has made permanent this interest.

The Corporation has also lost its beloved oldest member, Dr. Francis H. Williams, through resignation on account of age. Dr. Williams had been a member of the Corporation since 1882. He served as Secretary from 1891 to 1907 and was a member of the Executive Committee from 1883 to 1908, through a critical period in the Institute's history.

The term memberships of Messrs. Godfrey L. Cabot, William D. Coolidge and Redfield Proctor expired in June 1935.

Mr. Redfield Proctor has been elected to Life Membership on the Corporation, and Messrs. Arthur C. Dorrance, Charles E. Smith and Rufus E. Zimmerman to Term Membership to serve until June 1940.

Mr. Redfield Proctor has succeeded Mr. Charles T. Main on the Executive Committee, and Messrs. Bradley Dewey and William R. Hedge are serving temporary terms on the Executive Committee during such time as Messrs. Gerard Swope and Elihu Thomson are unable to attend the meetings.

The Faculty has lost Professors Samuel P. Mulliken and George L. Hosmer by death. Professor Mulliken died on October 24, 1934, after continuous service on the staff of the Department of Chemistry since 1895. Professor Hosmer served continuously on the staff of the Department of Civil Engineering from 1897 to October 1934, when he resigned on account of poor health. He died on January 10, 1935. Major Albert S. Smith, Superintendent of Buildings and Power from 1914 to 1933, died on September 20, 1935.

Professors D. C. Jackson, F. H. Bailey and W. J. Drisko retired on July 1, 1935, all with the title Professor Emeritus. Professor Jackson has been appointed a Special Lecturer, but is at present in Japan to deliver the Iwadare Lectures.

Losses by resignation are as follows: Professor R. Arthur; Assistant Professors R. G. Adams, C. E. Atkinson, E. W. Brugmann, B. Johnson, W. A. Liddell, J. W. Pratt and E. J. Tauch.

We have been very fortunate in securing Mr. E. L. Moreland, senior partner in the firm of Jackson and Moreland, who

received his Master's degree from the Institute in the Class of 1907, to replace Professor Jackson as Head of the Department of Electrical Engineering. Other new appointments are as follows: E. A. Hauser, Associate Professor of Chemical Engineering; James C. Ruddell, Associate Professor of Military Science; A. D. Fisken, Assistant Professor of Military Science and R. C. Hockett, Assistant Professor of Chemistry. Professor H. B. Phillips has been promoted to the Headship of the Department of Mathematics. The following promotions have been made within the Faculty. From the grade of Associate Professor to that of Professor: N. R. George, L. F. Hamilton, L. M. Passano and R. E. Rogers; from the grade of Assistant Professor to that of Associate Professor: M. J. Buerger, James Holt, E. H. Huntress, T. J. Johnston, Hans Mueller, A. A. Schaefer, D. C. Stockbarger, J. A. Stratton, K. L. Wildes, H. C. Willett and L. F. Woodruff. The following Instructors have been promoted to the Faculty with the rank of Assistant Professor: H. R. Bartlett, A. R. Davis, C. S. Draper, T. S. Gray, R. L. Hershey, M. W. Jennison, N. A. Milas, H. Peters and C. M. Wareham.

STATISTICS

Finances. The total operating income for the year 1934–35 was $3,395,540, which was $81,243 larger than in the preceding year and $107,004 more than in the year before that. It was, however, $306,645 less than the figure for 1931–32, which represents the peak of operating income in the Institute's history. The detailed report of the financial operations will be presented by the Treasurer. Suffice it to say here that the year ending June 30, 1935 was closed without a deficit, that the budget for the current year appears to be safely balanced, and that the market value of, and return from, our endowment funds are gratifying.

It was found possible to return to members of the staff the entire amount of their contributions during the year to the Salary Reserve Fund. As a matter of precaution, in view of the uncertainties of financial affairs generally, the Salary Reserve Plan has again been put into operation for the current year beginning July 1, 1935, but will be discontinued if there appears

to be no reasonable doubt of ability to close the year without a deficit.

One aspect of the past year's budget deserves special mention. When the budget was approved by the Executive Committee a year ago last April, it allowed a deficit of approximately $65,000 for the specific purpose of adding ten new members of highest calibre to strategic positions on the staff. In other words the Executive Committee felt that the investment in men was of greater importance than a balanced budget for this particular year. These additions were made, but happily the unanticipated increments of income during the year more than offset the expected deficit. In my report last year I mentioned the addition of these men as in my judgment "the most important step taken during the year." I am glad to say now that this judgment has been vindicated by the notable way in which they have strengthened our educational position and contributed to our work.

Enrolment. Statistics of enrolment are always interesting and important in indicating trends. I therefore bring up to date the table given in my last report.

Enrolment at M. I. T.

(As of November 1)

	Total Undergraduate	Freshmen	Total Graduate	New Graduate	Total Enrolment
1930–31.....	2,670	734	539	280	3,209
1931–32.....	2,610	628	578	294	3,188
1932–33.....	2,308	562	523	232	2,831
1933–34.....	2,106	485	500	226	2,606
1934–35.....	2,009	542	498	244	2,507
1935–36*....	2,027	568	517	262	2,544

* Figures as of October 2, 1935

The outstanding features shown in this table are the continuation of the upward trend in Freshman enrolment begun a year ago, and the large increase in the number of graduate students. It may be of interest to note that these graduate students came from 167 colleges and universities, of which 35 were foreign institutions. There is also indication of an increase in the number of students transferring from other colleges. These trends show that we are progressing in the manner

naturally to be expected in view of our unique place in the general scheme of technological education. We are advancing in a direction which I believe can be capitalized advantageously along lines which I shall discuss later.

Student Aid. Interesting trends in student aid are indicated in the following table:

Student Aid at M. I. T.

	1933–34		1934–35	
	Number	Amount	Number	Amount
Undergraduate Scholarships...	358	$62,559	423	$69,704
Graduate Scholarships and Fellowships.....	231	86,550	276	92,750
Loans.....	543	202,905	402	152,656
Student Employment Service..	235	31,323	404	52,007*

* Includes F.E.R.A. payments of $17,828

Scholarship and Fellowship aid, being largely endowed, has remained nearly constant. An increasing proportion of the scholarship funds are being made available to those in the Freshman year on a regional and competitive basis, leaving the needs of the upper years to be handled by the Technology Loan Fund. Similarly, Graduate Fellowships are now, in principle, awarded as prizes for distinctive promise and accomplishment rather than as financial aid to needy graduate students, though I believe further progress should be made to put this principle completely into practice in so far as it may be permitted by the terms of individual deeds-of-gift.

There have been fewer applications for loans, which undoubtedly reflects improvement in the financial status of the average American family. Increased student earnings likewise bear witness to improvement in business conditions, as well as to the effect of the Student Aid program of the Federal Emergency Relief Administration. This federal work aid is being continued and extended also to graduate students during the coming year by the National Youth Administration.

Industrial Co-operation. Indicative of the improvement in general business conditions is the increase in number of openings coming to the attention of the Placement Office from 382 in 1933–34 to 697 in 1934–35, and in the number of men known definitely to have been placed through this office

from 118 to 138. These numbers do not reflect accurately the improvement, since the quality of the openings and the nature of the placements have improved very considerably. The placement of the 1935 graduating class is very gratifying, less than ten per cent remaining unemployed at the date of this report.

Also indicative of improving industrial conditions is the fact that, for the first time since the beginning of the depression, the Division of Industrial Coöperation (exclusive of the Placement Office) will be self-supporting this year on the basis of contracts for research which make adequate provision for overhead. What is of far more significance from my point of view is the fact that these industrial research projects are of a fundamentally important nature. They deal with matters of high importance, both scientifically and industrially, and for the most part they are problems which have been baffling industry. Their handling by the Division has involved coöperative effort, drawing on the best resources of our staff in different departments and bringing different points of view to bear on the problems. One by one, these problems are being solved to the great satisfaction of our clients. Not within my knowledge of the Institute has the situation in this field been so wholesomely satisfactory.

ORGANIZATION

Turning now to matters of internal organization, three items deserve mention as marking progress in developments that have been under way for several years.

When the Schools of Architecture, of Engineering and of Science, and the Divisions of Humanities and of Industrial Coöperation were established, it was planned to appoint a Dean or Director in administrative charge of each of these parts of the Institute. For various reasons this plan has not yet been realized in the Division of Humanities. The need for the best possible development of our work in this field, within the limits imposed by our primary emphasis on technological education, has been urged on several occasions and notably in the last report of the Visiting Committee on the Department of English and History. For the present, therefore, there has been set up a special Faculty committee on the Division of

Humanities with the approval of the Heads of all the Departments involved and of the Standing Committee on General Studies. This committee, after investigation, will submit recommendations for the betterment of our work in this field.

For years there has been increasing pressure to establish new departments and to subdivide old ones, to give due recognition and treatment to the newly developed engineering techniques as they come to be important factors in our industrial life. To avoid on the one hand the Scylla of stagnation and on the other the Charybdis of dissipation, an attempt has been made to meet these needs through the appointment of interdepartmental committees, each charged with the responsibility of maintaining a progressive, coördinated and well-rounded program of research and instruction in its field. Such committees are now dealing with the subjects of Corrosion, Heat Transfer, Acoustics and Air Conditioning, and a committee on the Properties of Materials is in the process of formation. The results have been excellent in breaking down interdepartmental barriers and developing lively coöperative programs of research. The plan, due largely to Dean Bush, appears to be an important contribution to the solution of the great problem of complexity of interests in a large educational institution, and will be extended to further applications.

Related to this, but dealing primarily with instruction rather than research, is the problem of complexity in the course of study. As knowledge in a given field expands and the ramifications of its applications multiply, there is an almost irresistible tendency to insert all of these important things into the course of study required of the students. The inevitable result is narrowness and such crowding of facts and assignments upon the student as to deprive him of that opportunity for mental assimilation and digestion which is necessary if his intellectual food is to be transformed into intellectual power under the control of a well-developed judgment. This is probably the most difficult problem facing all professional schools.

Our Faculty have been wrestling with this knotty problem for several years. First they set up a unified basic course of study in the first two years, which is a great improvement over the previous heterogeneous program. Then they undertook the more difficult problem of the upper undergraduate

years, in an effort to introduce greater simplicity in programs and more uniformity in the educational policy of the different departments. During the year this effort led to the adoption by the Faculty of an excellent set of basic guiding principles and to agreement to try to adjust departmental courses of study so as to conform as closely as possible with these principles. The actual realization of this program rests with the initiation of the departments under supervision of the Faculty committee on Undergraduate Courses. I believe that the study and discussion of this problem have been of real value to the Faculty and that our educational work will be markedly improved thereby.

PURPOSES AND THEIR ACCOMPLISHMENT

In deciding what objectives we shall strive for as we look to the future, it is important, first of all, to see clearly our basic purposes, our *raison d'etre.* It is in the spirit of the times to check plans and practices against the constitution — in our case our charter — to see if we are moving toward the objectives there set forth and if we are convinced that these objectives are sound.

The charter of the Massachusetts Institute of Technology was granted by the General Court of Massachusetts in 1861 "for the purpose of instituting and maintaining a society of arts, a museum of arts and a school of industrial science, and aiding generally by suitable means the advancement, development and practical application of science in connection with arts, agriculture, manufactures and commerce."

In interpreting this charter, I believe that the real purpose of the Institute, as specified by its founders, is expressed in the last phrase "and aiding generally by suitable means the advancement, development and practical application of science in connection with arts, agriculture, manufactures and commerce." Obviously the society of arts, the museum of arts and the school of industrial science were among those "suitable means" whereby this purpose could be carried out, means which appealed to the founders as particularly appropriate and effective. But these things were means to an end, the end being the advancement, development and practical application of science in connection with those aspects of our national life in which its

welfare may be promoted through science. This is a magnificent objective. It is the very mainspring of that type of progress which is the distinctive feature of our civilization. It is almost overwhelming to contemplate the extent of the influence, direct and indirect, which this Institution has had in shaping the last seventy years of the development of our country, in engineering accomplishment, scientific progress, creation of new products and promotion of public health. At the same time it has led thousands of people to experience the joy of creative accomplishment. We sit, therefore, today as custodians of a truly great ideal of institutional public service.

Granting, therefore, the past justification of the purposes for which this Institution was founded, does it follow that these purposes will be equally worthy of our continued effort and support in the future? From every angle that I can approach this question the answer is, emphatically, "Yes!" At no time in history has scientific progress been so rapid as at present and at no time has there been such rapid development of new materials, processes and products of engineering and invention. The trend is definitely upward in this field. It is logical that this should be so, since the greater our body of scientific knowledge and technical skill becomes, the greater is the opportunity of finding applications of this knowledge and skill to achieve desirable purposes. The world, and particularly our own country, is rapidly entering an era in which scientific management and technical skill will be increasingly important. Up to this time in history, growing population and the increasing demand of individuals for better standards of living have been largely aided by drawing upon the gifts and resources of nature, made available through expanding geographical frontiers. These frontiers have now been extended to cover practically all of the habitable portions of the earth, and the natural resources of soil, timber and minerals are in process of being quite generally exploited. It is inevitable, therefore, that men must learn how to use what they have more efficiently and find alternative sources of exhaustible products. I can, therefore, see no other answer to the question of the future than that the value of "the advancement, development and practical application of science in connection with arts, agriculture,

manufactures and commerce" will become an increasingly important condition of human welfare.

In considering this utilitarian aspect of our mission we should also not lose sight of its cultural aspect. Our increasing contact with and dependence upon science and its applications will continually raise the level of scientific education required to give any man that sympathetic understanding and appreciation of life which is the essence of true culture.

I would therefore summarize these considerations by asserting that our charter provides a sound directive for our efforts, that the purposes of the Institution have an ever-increasing value and that as trustees of this Institution we have a mission of no mean importance to insure the best possible accomplishment of its purposes. The practical question before us is, "How can the best possible accomplishment be secured?"

Certain important prerequisites to the successful fulfilment of our mission may be treated with but a word, for they are obvious generalities. The prime requisite is to have the highest possible quality of men on our staff, the second requisite is to have a good body of promising students and the third is to have adequate facilities. These matters are the continual concern of the administration, and I will for present purposes take it for granted that they are receiving due attention.

The problem that I have in mind is more specific and more basic than these. Perhaps it can be suggested by the questions: "What kind of men do we need on our staff, and why? What kinds of facilities should we have, and why? What type of students should we have and how should we handle them?" In short, "In what direction should we bend our efforts to be most effective in advancing, developing and applying science for the public welfare?"

In approaching these questions we should first make an appraisal of our situation and environment, in order to see where our efforts can be directed most advantageously. We find in the United States 630 colleges and universities, practically all of which give instruction in science. Taken together, these colleges expend more than $550,000,000 a year on their programs and enroll nearly 900,000 students. Among them we find distributed throughout the country, 155 degree-granting engineering schools, the majority of which are qualified to give

good basic instruction in their fields. In addition to these there are a great number of technical high schools, trade schools and industrial institutes which perform a valuable service in preparing young people for industrial employment as intelligent, skilled technicians.

We are now confronted with the question of our place in this situation. Thanks to the idealism and generosity of donors who have believed in our mission, we find ourselves possessed of endowment and facilities superior to those of other institutions in the same field of endeavor. I think all would agree that, under these conditions, our full opportunities will not be met by simply turning out more scientists, engineers and architects of essentially the same type and by the same methods as they are already being turned out in large numbers elsewhere. I say this in no disparagement of the work and value of our sister institutions, which are effectively meeting great needs of the country for men with this type of training. I say it only to emphasize the unique responsibility which we have to perform a service in the field of technology, which is not already being adequately performed and which can only be so performed with the aid of facilities which we have or can acquire.

It is not difficult to discover those particular directions in which the considerations of national need and of our facilities show our particular opportunity, for our recent experiences exhibit these features in striking manner.

Despite general unemployment, there is and always has been an urgent call for men of exceptional qualifications of character and training. With all the money which is being spent on education, it has seemed unbelievable, but it is true, that we simply do not know where to turn to find men whom we can unhesitatingly recommend for positions which are brought to our attention daily. This fact I consider to be the most important indication as to the direction which our major efforts should take.

The organization, environment and facilities of the Institute have proved themselves favorable for carrying on pioneering developments in applied science. Numerous examples could be cited from past and present experience to demonstrate the advantages in solving baffling technical problems of industry through that type of coöperative effort by specialists in

various fields which we have been developing, and which our organization of plant and personnel makes possible to an unusual degree. The fields represented and facilities available cover a wider range than those to be found in any other organization, private or governmental, of which I have knowledge.

Experience has established the mutual value of that close articulation of strong groups in pure science and engineering which again are a distinctive feature of our Institution. These groups stimulate and assist each other to an extent that I have not seen equalled elsewhere. This is due in part, I believe, to the close physical contact between the groups in our arrangement of laboratories and also to the similarity of basic interests and outlooks of the two groups.

From the very beginning of the Institute, there has been a notable record of advisory, and often active service to local and national governmental agencies. The contacts, thus established, continually open up new opportunities for service of this type.

All of these features are powerfully directed to our basic objective as set forth in the charter, and in my judgment they represent the lines of public service for whose effective development we should exert every effort and subordinate every other consideration. If this be true, then certain very definite conclusions follow as to our best procedure.

In the light of this analysis, the statements that we should maintain a staff of high distinction, deal with students of unusual promise and provide adequate facilities become more than mere generalities, they become definite specifications, as follows:

A. *Selecting Students of Unusual Promise.* We have seen that the unique unsatisfied demand is not for more scientifically and technically trained men, but for more such men of exceptional value to industry and to the public generally. We should, therefore, make the training of such men our primary educational objective. The first step in doing so is wise selection of students. This selection should be governed not only by the character of the applicants, but also with consideration of our ability to handle them to best advantage.

We already have a high standard of admission on the basis of scholarship, but I believe that we do not have an equally

effective basis of selection on other grounds which are jointly of equal importance in determining a youth's potentialities; grounds such as adaptability, persistence, resourcefulness, coöperativeness, high-mindedness, etc. These qualities are much harder to evaluate than scholarship, exhibited by grades. No group of men is wise enough to select such qualities infallibly. Yet, I believe every one conversant with our affairs would agree that we could do a better educational job on this material, and we could turn out a product that would come closer to meeting the most urgent need, men of exceptional value. I would like to see the situation in which a diploma from the Institute would be an unquestioned guarantee of exceptional value.

Approaching this matter from the other angle, two requisites to the most effective training of our students are: first, that their number shall not exceed the maximum number which can be handled most effectively within the limitations of our staff and facilities and, second, that this number shall not fluctuate so greatly as to prevent our maintaining a carefully chosen and trained staff to handle them. Neither of these requisites has been met in the past, for there have been times when we were detrimentally overcrowded, and there have been fluctuations which have required hasty and unsatisfactory rearrangements in staff.

I believe that the key to the handling of these matters, so as to produce the desired results, is the adoption of a policy of stabilizing student enrolment at a figure shown, by careful analysis, to be the most advantageous figure in the light of our existing facilities of staff and equipment. This figure should be subject to change from time to time, in accordance with changing conditions, but should always be determined with the objective of turning out the very finest type of graduate in goodly numbers, but subordinating numbers to quality. The full value of the plan will be realized when the number of applicants exceeds the number which should be admitted, for then the selective process is most effective and the stimulating reaction on those already admitted is powerful.

The proper procedure for administering such a plan for stabilization and selection is fairly clear in principle but somewhat complicated in detail. I have appointed an excellent

committee, headed by Dean Lobdell, to make a careful study of our situation and present a plan for consideration by the Faculty which, if approved by them, will then be submitted to the Executive Committee. This study is well under way and its general features, together with specific details of the first steps to be taken, will undoubtedly come up for consideration early in the current academic year.

B. *Direct Contributions to "the advancement, development and practical application of science."* In introducing this subject I make what is perhaps a startling assertion, but it is one which I believe to be demonstrable from a study of the facts. The entire cost of the Massachusetts Institute of Technology, in effort and in money, from its beginning, has been amply justified by its direct contributions to public welfare, even if it had never graduated a single student; reciprocally this cost has also been amply justified by the results of its educational program with students irrespective of the direct contributions of its staff to public welfare. Thus there is a double justification. I am firmly convinced, however, that neither of these aspects of the fulfilment of our charter obligations is possible of best fruition without the accompaniment of the other.

In my Report for 1931–32 I stated my belief that an urgent need of the Institute is additional endowment of $5,000,000, to add effectiveness to our research program. After four years of additional observation and study of our situation I still stand by that statement, for I see specific directions in which the income from such an endowment could be applied to carry on pioneering developments which are now ready to go and which give good promise of important public benefits in health, in solution of serious industrial problems, in development of new industries and in raising the standard of engineering art and fundamental scientific knowledge. Furthermore, there is every reason for believing that this opportunity will be a continually growing one. I can go into detail if this is desired, though most of you are acquainted with at least some aspects of the situation.

At the present time, however, I should like to present the matter on a somewhat deeper and broader basis, that of the advantages, in line with our charter, which would accrue from an opportunity to pursue more vigorously our program of

creative work in all our fields, science, engineering, business and engineering administration, and architecture, including city planning. These advantages include not only the direct public value of the creative work of the staff, but also the educational value to our students of contact with and participation in such work.

Among the elements favorable to such a program are the following: the educational program requires a staff which includes experts in almost every aspect of science and engineering. Thus there is available for attack on any problem a coöperating group with wider range of experience and approach than can be found in any other organization of which I know. Because of the teaching program, therefore, this framework of a research organization is already provided. This fact, combined with tax exemption, makes possible an extraordinary output of research in proportion to overhead costs. We should therefore be, and I believe we are, an exceptionally efficient research organization. The nature and ideals of the Institute insure that all such work will be carried on, to the best of our ability, in the public interest. The character and assured permanence of the Institute enable it to undertake pioneering and long-range programs which show promise of ultimate public benefit or industrial promise, but which are too long range or embryonic or uncertain as to industrial value to be the proper concern of industrial research laboratories. Here is one of the fields in which the university laboratory has a unique opportunity. To the extent that the staff is engaged upon research, it maintains itself in a state of preparedness to reply effectively to the requests for assistance to municipal, state and federal agencies. These requests are well-nigh continuous and their execution is a significant portion of the Institute's responsibility. Reciprocally, a staff which is active and alert in handling the live problems of the technological professions is best able to steer its students, as apprentices, into these professions.

So I maintain that an extension of our research program is justified on the grounds of our charter obligations, of its inherent public value, of the efficiency of its performance and of its favorable reaction on our educational work.

In speaking of the reaction of research on our educational work I would like to go one step further, I would like to see

research actually made a more important feature of the student's curriculum. At present it is a basic part of our program of postgraduate training, and well approved as such. In our undergraduate course of study it is generally involved only in the senior thesis. It is true that relatively few colleges require any undergraduate thesis at all, and to that extent we are already in an advanced position. But the great pressure to include in the curriculum everything that the young man ought to know tends to crowd out the thesis through lack of time. I believe that our educational effort would be more productive of good results if we reversed this tendency, if we were more willing frankly to admit that our students will still have many things to learn after graduation, which they can learn while on their jobs, and that we had better devote relatively more effort in training them to handle with judgment, skill and resourcefulness, situations typical of those to be met in high-grade positions in their later careers. In other words, as students mature under our tutelage, we should treat them less and less as sponges or computing automatons and more as men with a divine spark of creative genius which we try to discover and fan into a flame.

I am, of course, using the word "research" in a broad sense to signify any attack on a professional problem whose handling calls forth creative effort, and not merely reproduction of some one else's procedure. In my experience as a teacher, no other educational approach compares with this in bringing out those qualities of interest, enthusiasm and independence which we desire above all else to stimulate. To be successful, however, it must be done well. It is not an approach suited to mass production of graduates or to a mediocre group of students. It requires extraordinary skill and resourcefulness on the part of instructors, a resourcefulness that can only exist if they themselves are active in developing the frontier territory of their profession. It requires a larger staff and more facilities than the mass production methods of classroom instruction. But I believe that greater emphasis on it than we give at present would pay large dividends on the extra effort and expense involved, and that our charter and our unique position invite us to undertake it.

There is urged, therefore, a more adequate development

of our research program along lines that will increase the value of the direct contributions of our staff, and that will permeate down into the undergraduate years. In saying this I do not lose sight of the need of improvement also in the instruction of the lower years, where the pedagogical skill of the teacher must be emphasized in a somewhat different form, and which we should be able to handle without calling on you for help.

To summarize, therefore, I submit to you two recommendations: (1) The adoption of a plan of stabilization of enrolment, designed to improve the selection and the teaching of our students; and (2) better development of our research program, designed to improve the training of our students in their upper years and to make more effective our "advancement, development and practical application of science in connection with arts, agriculture, manufactures and commerce."

If you approve these recommendations in principle, the next question will be that of "ways and means." As to the first, we can look to our committee headed by Dean Lobdell to submit a plan which will be within our power to carry out. As to the second, we need additional financial resources of considerable magnitude to take the big step in advance, which I believe we should take. An endowed research fund, as mentioned before, would be the ideal permanent solution. Temporary funds would afford a temporary solution. At present we are enabled to make some real progress in the desired direction through the generous contributions of our newly formed group of Research Associates. We hope to increase considerably the membership of this group and its chairman, Mr. Hayden, and I will be grateful for any help that you can give us in securing new contributing members, either individuals or organizations.

In conclusion, my personal message to you, at the conclusion of five years of service in this Institution, is one of gratitude for your continual and unfailing encouragement and support, and of appreciation of the splendid loyalty and ability of our staff, among whom I would acknowledge particular indebtedness to the two who are also members of this Corporation, our Vice-President and our Treasurer.

KARL T. COMPTON.

REPORTS OF ADMINISTRATIVE OFFICERS

Dean of Students. Financial assistance to students continues to be a major problem of this office, but there is further evidence to confirm the opinion expressed a year ago that the peak of the demand was reached in 1932–33. Both in numbers of applications and amounts loaned there has been a decline for the second successive year, and a rise in the ratio of repayments to maturities.

During 1934–35, 520 students sought to borrow from the Technology Loan Fund, as compared with 712 in 1933–34 and 744 in 1932–33. Of this year's requests, 402, or 77.3 per cent, received favorable action, the amount loaned being $152,656. The corresponding figures for the two preceding years were: 543, 76.3 per cent, and $202,905, in 1933–34; and 527, 70.8 per cent, and $203,780, in 1932–33.

The Fund has now completed the first half decade of operation and, up to June 30, 1935, 1,334 individuals have borrowed $792,016, of which amount $111,434 has already been repaid. This latter figure represents 66 per cent of the face value of the matured notes and contrasts with similar ratios of 58 on June 30, 1934, and 48 on June 30, 1933. It should also be noted that this year $14,498 of notes were paid in advance of maturity, contrasted with $6,412 and $1,326 during the two preceding years.

Undergraduate scholarship awards numbered 423 and amounted to $69,704, compared with 358 totalling $62,559 last year. Of this year's awards, 144 carrying stipends of $26,550 went to entering freshmen, the corresponding figures for 1933–34 being 69 and $18,900. The percentage of the undergraduate body receiving scholarship aid during 1934–35 was 20.2, compared with 17.0 in 1933–34, 15.9 in 1932–33, 14.95 in 1931–32, 18.2 in 1930–31, and 15.8 in 1929–30.

Student employment conditions improved and 354 men were placed by the Undergraduate Employment Bureau of the Technology Christian Association to earn $34,180. This compares with 235 earning $31,323 in 1933–34 and 181 earning

$28,617 in 1932–33. Also, under the F.E.R.A. program of the federal government, $17,828 was paid to 295 individuals.

For the first time in several years the dormitory system operated to capacity during the first semester, with at times a waiting list of nearly 60, and with a maximum of but 18 vacancies during the second semester. This situation was partially accounted for by the conversion of more undergraduate space to enlarge the Graduate House.

The organization of the commuting students, the "5.15 Club," has, during its second year, successfully promoted several events of an All-Technology nature designed to bring about a closer relationship between the three organized student groups: Dormitories, Fraternities, and Commuters. Largely through its influence the date and program of the All-Technology Smoker was changed by the Institute Committee so as to come on the day following the close of the Freshman Camp. This event, to which the fathers of incoming students were invited, together with the Open House, again held in the spring under the management of the Combined Professional Societies, served to acquaint parents, especially those residing in the vicinity of Boston, with many of the features of Technology student life.

The average scholastic record of 604 men in 24 activity groups was 3.35 in June of 1935; the corresponding averages being 3.48 for 670 men in 25 activities in June of 1934, and 3.42 for 633 men in 26 activities in June of 1933. Fraternity averages declined slightly, for the average of 582 men in June of 1935 was 3.13, while 593 averaged 3.23 in June of 1934, and 598 averaged 3.14 in June of 1933.

Tech Show and the Musical Clubs again operated under serious difficulties, due to a lack of student interest and financial support. The four publications, on the other hand, conducted their year's activities successfully in a journalistic sense, and without financial loss. During the year, for the second time in succession, the *Tech Engineering News* was awarded the Yale Cup for publishing the best undergraduate engineering magazine.

During the year two important improvements in the physical equipment for athletics came into use: the Barbour Field House, dedicated in the autumn during the Field Day exer-

cises, and the remeasured and marked rowing courses on the Charles which were used for the first time in collegiate competition for the Compton Cup on April 27. The year also marked the end of the existing system whereby some coaching salaries have been met by the Corporation and some by undergraduate funds. Now all have been included on the Institute's budget, thus relieving a condition which had given occasional cause for dissatisfaction.

Undergraduate athletics, both at Technology and throughout the United States, however, suffered a heavy loss through the death of Allan Winter Rowe, '01. The present system of athletic management at the Institute, founded under the auspices of the late Major Frank Harrison Briggs, '81, was brought to fulfillment very largely through the capable administrative efforts of Dr. Rowe, who served as Secretary of the Advisory Council on Athletics from June, 1914 until he died in December, 1934. His sympathetic understanding of undergraduates and their problems is reflected in the immediate response by hundreds of former students to the Advisory Council's request for funds to have his portrait painted for presentation to the Institute.

In conclusion it should be noted that the spring of 1935 saw undertaken the first intensive study of the problem of the stabilization of the Institute's enrollment by a committee of the Faculty. The objective is to formulate a plan whereby the wide fluctuations, particularly in the numbers of freshmen, which have occurred since the War may be minimized.

H. E. LOBDELL.

Dean of the Graduate School. The Graduate School has completed another successful year viewed from the standpoint of registration, quality of its students, and activities in the various fields of research. The Committee on the Graduate School, together with its Sub-Committees, has undertaken a complete revision of its rules of procedure and the Faculty has approved such changes as have necessitated a modification of its rules. These changes have unified the general requirements for the Doctor's degree throughout all departments; thus hereafter all Major examinations for the doctorate must be both

written and oral and all reading tests in French and German are to be conducted by the Department of Modern Languages. Simplifications in procedure regarding Minors were also adopted.

A new regulation which it is hoped will simplify the preparation of lists of candidates for graduation is the adoption of a Degree List. This places the initiative and responsibility of having his name presented to his Department Committee and to the Committee on the Graduate School for consideration as a candidate for a degree, on the student rather than on his Department and the Secretary of the Faculty as heretofore. This regulation went into effect last April but further experience is desirable before its merits can be fully judged.

Graduate scholarships and fellowships are awarded primarily on the basis of scholarship. In the award of certain funds, however, the financial need of the student is also given weight; only those applicants who wish to be considered for these scholarships are now required to present with their application a supplementary statement giving confidential information regarding their resources and financial needs. It may be added that a very large proportion of the applications received this last year were accompanied by such a statement.

Upon the Committee's recommendation the degrees of Master of Science and Doctor of Science in Ceramics and in Petroleum Engineering, respectively, have been added to those now offered in the Department of Mining and Metallurgy.

The great success of the Graduate House established in 1933 justified its enlargement this past year so as to embrace the complete group of dormitories adjacent to the President's House. The House now has accommodations for 206 students. Two additional attractive lounge and reading rooms have been added on the first floor at the west end of the dormitory group, one of which is named the Macomber Room, in honor of Mr. John R. Macomber, a member of the Corporation. A beautiful dining room known as the Fabyan Room, in honor of Mr. Francis W. Fabyan of the Corporation, offers facilities for intimate dinner gatherings. Were it possible to remodel a number of double suites into single rooms, the desires of most graduate students would be better met, particularly of those coming to the Institute for the first time. Dr. Ashdown, the House

Master, has shown great tact in handling the difficult problem of the allotment of rooms to students who have never met before coming to the Institute. The selection of a congenial roommate is no small factor in determining not only a student's enjoyment of his post-graduate period of study, but also the success with which he is able to carry on his work.

The privilege of living in the Graduate House is fully appreciated by the students. Besides providing attractive surroundings, the Graduate House offers to its residents opportunities for numerous social gatherings, which have proved a very pleasant feature of the house plan worked out by Dr. Ashdown and his student committees. Four Sunday afternoon teas and eighteen informal Wednesday evening dinners were held during the winter, at which the students had an opportunity to meet members of the Faculty and their guest speakers, many of whom were of national prominence.

To indicate the cosmopolitan character of the group in Graduate House it may be noted that 92 different colleges and ten foreign countries were represented; 138 students held degrees from institutions other than Technology. At the present time every available room has been leased for the coming year and there are 30 names on the waiting list.

The registration of the Graduate School was larger than might have been expected under existing conditions, namely 500 (as of November 1), a decrease of only three from the preceding year. Three hundred and twenty-eight, or 65 per cent of the students, had received their Bachelors' degrees from other universities, colleges, or technical schools, before coming to the Institute. A comparison of the past four years' registration is shown below:

	1934	*1933*	*1932*	*1931*
Doctor of Philosophy	101	94	84	66
Doctor of Science	88	77	65	85
Doctor of Public Health	0	0	0	2
Master in Architecture	16	11	9	12
Master of Science	266	297	332	386
Special Graduate Students	29	24	33	27
Total	500	503	523	578

It is of interest to note that the number of students studying for the doctorate has materially increased during these years; the decrease in total registration is due wholly to students in the Master's group.

The Graduate School included students from every state in the Union, except South Carolina, West Virginia, South Dakota, Idaho, Nevada, Utah, Wyoming, and from Hawaii and from the following 33 foreign countries:

Argentine Republic	Dutch West Indies	Mexico
Austria	Ecuador	Newfoundland
Belgium	England	Norway
Bermuda	France	Panama
Brazil	Germany	Russia
British West Indies	Holland	Siam
Canada	India	South Africa
Chile	Irak	Switzerland
China	Ireland	Syria
Colombia	Italy	Turkey
Cuba	Japan	Venezuela

One-hundred and thirty-two American institutions and thirty-five foreign schools were represented.

In December 1934 and June 1935, 180 higher degrees were conferred as follows:

Doctor of Philosophy.....	25
Doctor of Science.....	11
Master of Science.....	144

The scholarship budget for 1934–35 amounted to $92,750, of which $15,500 was appropriated to meet the tuition of members of the Staff and $25,000 to be awarded as special half-tuition scholarships. Even with these liberal special appropriations, the number of applicants, 551, far exceeded the number of awards, 276. One hundred and fifty-three awards were made to students working towards the Doctor's degree and 123 to those working towards the Master's degree. Eighty-four members of the Staff pursuing graduate work received grants in amounts to cover their tuition in whole or in part. This group of graduate students has been steadily increasing, being 18 per cent greater this year than last. Teaching fellowships and assistantships are eagerly sought in all departments as

affording the best means by which a student can partially finance himself during his graduate study.

The total number of students receiving scholarship aid last year was 55 per cent of the total registration in the Graduate School, an increase of about 9 per cent over the preceding year. Had it not been for the two above-mentioned special appropriations a very material decrease in registration would certainly have resulted. A study of the allotment of scholarships shows that the distribution of awards between Institute and non-Institute graduates was approximately proportional to their respective number, the difference being slightly in favor of Institute students, regarding whose scholastic standing there could be no doubt. A further study of the June records shows that in only two instances did a scholarship recipient fail to make a satisfactory record. This is indicative of the careful scrutiny given to scholastic standing of applicants by Department Committees before making recommendations to the Committee on Awards.

The need for additional fellowships carrying stipends in excess of tuition is urgent. The Scholarship Committee has considered the advisability of increasing the amount of certain awards from current scholarship income at the expense of reducing the number, but with the pressing need of so many applicants at the present time this has not seemed justified. If a number of $1,000 fellowships were available to applicants throughout the country it would make possible registration in the Graduate School of outstanding students in science and engineering who, for financial reasons only, now find it necessary to go elsewhere.

The fellowships provided this year by Mr. Redfield Proctor and Mr. Alfred P. Sloan, Jr. were awarded to Mr. Norman Levinson and Mr. Horace R. Byers, respectively. Mr. Levinson studied at Cambridge, England, completing there several important papers on Mathematics. He received his Doctor's degree from the Institute in June and under a National Research Fellowship will work with Professor Einstein at Princeton this coming year. Mr. Byers completed his work for the doctorate in Meteorology and in recognition of his work on weather forecasting by air mass analysis methods has received the important

appointment of associate meteorologist in the United States Weather Bureau.

In certain departments, notably that of Chemical Engineering, Organic Chemistry, and Physics, laboratory space available for research will soon become inadequate if registration continues to increase at the present rate. Limitation will then have to be placed on the number of students who can be admitted to graduate work in these fields as the Graduate School desires to maintain the policy of admitting students in any department only so far as the department has adequate staff and facilities for carrying on graduate work in a wholly satisfactory manner. The Committee has welcomed the recent appointment of a Faculty Committee to study the general question of Stabilization of Enrollment.

H. M. GOODWIN.

The Registrar. The total registration last year decreased to 2,507, a drop of 99, or 4 per cent, as compared with decreases of 8 per cent and 11 per cent for the two preceding years.

The Freshmen Class increased 57, or 12 per cent, and it is expected that there will be a similar increase for the year 1935–36. Two hundred and forty-nine secondary schools in 27 states and the District of Columbia were represented in the Freshman Class, as well as 10 secondary schools in 7 foreign countries. Massachusetts led the group with representation from 83 schools. Fifty-four per cent of the students entering from secondary schools were admitted without examinations, as compared with 44 per cent in 1933 and 18 per cent in 1932.

The number of students who withdrew voluntarily during the year was the smallest since 1928–29, and it was less than 50 per cent of the number in 1933–34.

The statistics for the year 1934–35 follow:

All statistics on registration are as of November 1, 1934
All statistics on degrees are through June, 1935

TABLE 1
The Corps of Instructors

	'22	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34
Faculty Members of the Staff	174	175	174	179	185	199	215	220	240	253	242	235	245
Professors	56	61	64	63	68	73	82	81	86	98	93	88	83
Associate Professors	40	43	42	49	55	58	61	59	63	68	60	57	69
Assistant Professors	48	46	51	53	51	58	64	71	80	79	81	80	82
Ex-Officio	—	—	—	—	—	—	—	2	4	3	3	5	6
Instructors	30	25	17	14	11	10	8	7	7	5	5	5	5
Other Members of the Staff	217	200	220	236	264	268	272	295	323	335	283	263	272
Instructors	80	92	98	112	116	115	119	116	123	133	105	90	86
Teaching Fellows	—	—	—	—	—	—	—	—	—	—	21	22	20
Assistants	87	60	59	53	63	55	53	68	70	96	45	43	70
Technical Assistants	—	—	—	—	—	—	—	—	—	—	28	31	28
Lecturers	15	6	16	21	23	30	29	32	32	34	28	25	25
Research Associates	19	25	26	21	24	29	22	21	31	31	32	25	22
Research Assistants	16	17	21	29	38	39	49	58	65	36	20	21	18
Research Fellows (D.I.C.)	—	—	—	—	—	—	—	—	2	5	3	3	2
Research Fellows	—	—	—	—	—	—	—	—	—	—	—	3	1
Special Investigator	—	—	—	—	—	—	—	—	—	—	1	—	—
Total	391	375	394	415	449	467	487	515	563	588	525	498	517
Other Members of the Faculty	16	16	15	17	14	13	11	14	15	15	17	25	26
Professors: Emeriti	8	8	7	7	6	6	4	4	6	7	13	21	23
Retired	6	5	5	7	5	4	3	4	3	3	—	—	—
Non-Resident	2	3	3	3	3	3	4	6	6	5	4	4	3

TABLE 2
Registration Since the Foundation of the Institute

Year	Number of Students	Year	Number of Students	Year	Number of Students
1865–66	72	1889–90	909	1913–14	1,685
1866–67	137	1890–91	937	1914–15	1,816
1867–68	167	1891–92	1,011	1915–16	1,900
1868–69	172	1892–93	1,060	1916–17	1,957
1869–70	206	1893–94	1,157	1917–18	1,698
1870–71	224	1894–95	1,183	1918–19	1,819
1871–72	261	1895–96	1,187	1919–20	3,078
1872–73	348	1896–97	1,198	1920–21	3,436
1873–74	276	1897–98	1,198	1921–22	3,505
1874–75	248	1898–99	1,171	1922–23	3,180
1875–76	255	1899–00	1,178	1923–24	2,949
1876–77	215	1900–01	1,277	1924–25	2,938
1877–78	194	1901–02	1,415	1925–26	2,813
1878–79	188	1902–03	1,608	1926–27	2,671
1879–80	203	1903–04	1,528	1927–28	2,712
1880–81	253	1904–05	1,561	1928–29	2,868
1881–82	302	1905–06	1,466	1929–30	3,066
1882–83	368	1906–07	1,397	1930–31	3,209
1883–84	443	1907–08	1,415	1931–32	3,188
1884–85	579	1908–09	1,461	1932–33	2,831
1885–86	609	1909–10	1,479	1933–34	2,606
1886–87	637	1910–11	1,506	1934–35	2,507
1887–88	720	1911–12	1,559		
1888–89	827	1912–13	1,611		

TABLE 3

Classification of Students by Courses and Years

Course Name and Number	1932–33 YEAR						1933–34 YEAR						1934–35 YEAR					
	1	2	3	4	G	Total	1	2	3	4	G	Total	1	2	3	4	G	Total
Aeronautical Engineering XVI	87	22	26	28	30	193	56	25	24	30	27	162	65	28	30	28	32	183
Architectural Engineering IV-A	5	5	13	9	2	34	5	6	8	12	—	31	4	4	4	8	3	23
Architecture IV, IV-B	18	25	31	38	13	*125	16	20	24	27	18	*105	14	16	22	25	16	*93
Architecture (IV, IV-B) Fifth Year	—	—	—	—	—	34	—	—	—	—	—	30	—	—	—	—	—	27
Army Ordnance	—	—	—	11	—	11	—	—	—	9	—	9	—	—	—	—	9	9
Biology and Public Health VII	11	19	20	21	23	94	10	20	17	19	26	92	10	11	20	19	21	81
Building Engineering and Construction XVII	8	12	15	9	1	45	9	11	9	13	1	43	5	6	12	8	—	31
Business and Engineering Administration XV	88	107	91	62	23	371	58	86	99	83	17	343	50	79	70	90	16	305
Chemical Engineering X	68	61	61	43	40	273	83	66	56	51	37	293	98	58	69	42	57	324
Chemical Engineering Practice X-A, X-B	—	—	—	3	39	42	—	—	—	3	27	30	—	—	—	6	26	32
Chemistry V	23	22	17	19	65	146	22	20	21	17	65	145	28	16	20	16	57	137
Civil Engineering I	35	23	33	44	35	170	32	23	22	38	25	140	35	28	22	21	23	129
Electrical Engineering VI, VI-C	47	40	61	66	70	284	43	36	51	60	56	246	62	28	48	49	55	242
Electrical Engineering (Coöperative) VI-A	37	41	28	28	25	159	39	34	24	26	26	149	32	37	24	23	22	138
Electrochemical Engineering XIV	10	14	8	7	3	42	8	7	11	8	1	35	11	8	7	8	4	38
General Engineering IX-B	4	5	7	16	—	32	2	12	10	11	—	35	6	11	21	14	—	52
General Science IX-A	1	—	4	5	—	10	1	—	3	8	—	12	2	2	1	5	—	10
Geology XII	2	—	3	4	11	20	—	3	2	2	14	21	—	3	2	3	8	16
Mathematics XVIII	3	3	7	6	12	31	3	5	3	8	9	28	7	5	10	3	10	35
Mechanical Engineering II	62	57	57	91	48	315	59	51	53	55	52	270	59	62	44	50	40	255
Metallurgy $III_{3,4}$	2	8	20	11	17	58	9	3	9	21	21	63	6	15	4	7	16	48
Mining Engineering $III_{1,2}$	5	9	10	7	5	36	5	5	8	10	7	35	8	6	4	8	6	32
Mining Engineering (Ceramics)	—	—	—	—	—	—	—	—	—	—	2	2	—	—	—	—	2	2
Naval Architecture and Marine Engineering XIII	17	13	19	10	4	63	13	18	14	19	2	66	18	18	23	13	3	75
Naval Construction XIII-A	—	—	10	11	13	34	—	—	5	10	11	26	—	—	8	7	10	25
Physics VIII	23	23	38	15	39	138	10	22	25	32	52	141	16	13	18	20	59	126
Railroad Operation I-A	—	—	—	2	3	5	—	—	—	—	2	2	—	—	—	—	—	—
Sanitary Engineering XI	2	1	3	3	2	11	2	2	2	5	2	13	4	1	2	2	3	12
Ship Operation XIII-C	3	7	13	7	—	30	—	5	7	12	—	24	2	1	6	6	—	15
Unclassified	1	9	11	4	—	25	—	7	6	2	—	15	—	7	5	—	—	12
Totals	562	526	606	*580	523	2,831	485	487	513	*591	500	2,606	542	463	496	*481	498	2,507

*These totals do not include fifth year in Architecture and City Planning.

TABLE 4-A

Classification of Students by Courses, Options and Years

COURSE NO.	COURSE NAME	COURSE OPTION	Option	YEAR 1 Opt.	YEAR 1 Tot.	YEAR 2 Opt.	YEAR 2 Tot.	YEAR 3 Opt.	YEAR 3 Tot.	YEAR 4 Opt.	YEAR 4 Tot.	GRAD. Opt.	GRAD. Tot.	TOTAL Opt.	TOTAL Tot.	COURSE NUMBER
I	Civil Engineerng.	1. General	1	27		20		11		12		—		—		
		2. Transportation Engineering	2	5		4		10		4		—		—		
		3. Hydroelectric Engineering	3	3	35	3	28	1	22	5	21	—	23	—	129	I
		4. Geodesy and Seismology	4	—		1		—		—		—		—		
II	Mechanical Eng.	1. General	1	—		—		—		12		—		—		
		2. Automotive	2	—		—		—		12		—		—		
		3. Power	3	—		—		—		5		—		—		
		4. Refrig. and Air Condition.	4	—	59	—	62	—	44	6	50	—	40	—	255	II
		5. Production	5	—		—		—		11		—		—		
		6. Textile	6	—		—		—		4		—		—		
III	Mining Eng. and Metallurgy	1. Mining	1	4		5		4		6		6		32		
		2. Petroleum Production	2	4		1		—		2		—		—		
		3. Metallurgy	3	6	14	7	21	2	8	4	15	16	24	48	82	III
		4. Physical Metallurgy	4	—		8		2		3		—		—		
		Ceramics	Cer.	—		—		—		—		2		2		
IV	Architecture			—	14	—	16	—	22	—	20	—	16	—	*88	IV
IV	Architecture — Fifth Year			—		—		—		—		—		—	22	IV (5th Yr.)
IV-A	Architectural Engineering			—	4	—	4	—	4	—	8	—	3	—	23	IV-A
IV-B	City Planning			—		—		—		—	5	—		—	*5	IV-B
IV-B	City Planning — Fifth Year			—		—		—		—		—		—	5	IV-B (5thYr.)
V	Chemistry			—	28	—	16	—	20	—	16	—	57	—	137	V
VI	Electrical Engineering			—	62	—	28	—	22	—	26	—	55	—	193	VI
VI-C	Electrical Engineering (Communications)			—		—		—	26	—	23	—		—	49	VI-C
VI-A	Electrical Engineering (Coöperative)			—	32	—	37	—	24	—	23	—	22	—	138	VI-A
VII	Biology and Public Health	1. Biology and Public Health	1	3		10		12		9		—		—		
		2. Industrial Biology	2	7	10	1	11	4	20	8	19	—	21	—	81	VII
		3. Public Health Engineering	3	—		—		4		2		—		—		
VIII	Physics			—	16	—	13	—	18	—	20	—	59	—	126	VIII
IX-A	General Science			—	2	—	2	—	1	—	5	—	—	—	10	IX-A
IX-B	General Engineering			—	6	—	11	—	21	—	14	—	—	—	52	IX-B
X	Chemical Engineering			—	98	—	58	—	69	—	42	—	57	—	324	X
X-A	Chemical Engineering Practice — Graduate			—	—	—	—	—	—	—	—	—	26	—	26	X-A
X-B	Chemical Engineering Practice — Undergraduate			—	—	—	—	—	—	—	6	—	—	—	6	X-B
XI	Sanitary Engineering			—	4	—	1	—	2	—	2	—	3	—	12	XI
XII	Geology			—	—	—	3	—	2	—	3	—	8	—	16	XII
XIII	Naval Architecture and Marine Engineering			—	18	—	18	—	23	—	13	—	3	—	75	XIII
XIII-A	Naval Construction			—	—	—	—	—	8	—	7	—	10	—	25	XIII-A
XIII-C	Ship Operation			—	2	—	1	—	6	—	6	—	—	—	15	XIII-C
XIV	Electrochemical Engineering			—	11	—	8	—	7	—	8	—	4	—	38	XIV
XV	Business and Engineering Administration	1a. Civil Engineering	1a	3		6		1		3		—		—		
		1b. Mechanical Engineering	1b	20		30		37		41		—		—		
		1c. Industrial Practice	1c	13	50	22	79	11	70	20	90	—	16	—	305	XV
		2. Chemical Engineering	2	14		21		21		26		—		—		
XVI	Aeronautical Engineering			—	65	—	28	—	30	—	28	—	32	—	183	XVI
XVII	Building Engineering and Construction			—	5	—	6	—	12	—	8	—	—	—	31	XVII
XVIII	Mathematics			—	7	—	5	—	10	—	3	—	10	—	35	XVIII
	Army Ordnance			—		—		—		—		—	9	—	9	A. O.
	Unclassified			—		—	7	—	5	—		—		—	12	UNC.
Total					542		463		496		*481		498		2,507	Total

*These totals do not include fifth year in Architecture and City Planning.

TABLE 4-B

CLASSIFICATION OF SPECIAL STUDENTS BY COURSES AND YEARS
(Included in Table 4-A)

COURSE	OPT.	YEAR 1	2	3	4	G	TOTAL	COURSE
I Civil Engineering		—	—	—	—	1	1	I
II Mechanical Engineering		—	—	—	4	3	7	II
III Mining Engineering and Metallurgy	3,4	—	—	—	—	3	3	III$_{3,4}$
IV Architecture		—	1	3	3	—	*7	IV
IV Architecture (Fifth Year)		—	—	—	—	—	3	IV (5th Yr.)
IV-B City Planning		—	—	—	1	—	1	IV-B
V Chemistry		1	—	1	1	4	7	V
VI Electrical Engineering		2	1	1	1	2	7	VI
VII Biology and Public Health		—	2	4	1	5	12	VII
VIII Physics		—	—	1	—	2	3	VIII
IX-B General Engineering		—	—	1	—	—	1	IX-B
X Chemical Engineering		—	—	—	—	4	4	X
X-A Chemical Engineering Practice		—	—	—	—	1	1	X-A
XII Geology		—	1	—	1	1	3	XII
XIII Naval Architecture and Marine Eng.		—	—	2	2	2	6	XIII
XV Business and Eng. Administration		—	—	2	—	—	2	XV
XVI Aeronautical Engineering		—	—	—	—	8	8	XVI
XVIII Mathematics		—	—	1	—	—	1	XVIII
Total		3	5	16	*14	36	77	

*These totals do not include fifth year in Architecture.

TABLE 4-C

CLASSIFICATION OF FORMEB STUDENTS WHO RETURNED THIS YEAR*
(Included in Table 4-A)

COURSE	OPT.	YEAR 1	2	3	4	G	TOTAL	COURSE
I Civil Engineering		1	1	1	1	3	7	I
II Mechanical Engineering		3	3	2	2	7	17	II
III Mining Engineering and Metallurgy	1,2	1	—	—	—	2	3	III$_{1,2}$
	3,4	—	—	1	—	1	2	III$_{3,4}$
	Cer.	—	—	—	—	1	1	III$_{Cer.}$
IV Architecture		—	—	1	—	3	4	IV
IV-A Architectural Engineering		—	—	—	1	1	2	IV-A
V Chemistry		1	—	1	—	8	10	V
VI Electrical Engineering		—	—	1	3	3	7	VI
VI-A Electrical Engineering, Coöperative		1	—	—	—	1	2	VI-A
VI-C Electrical Engineering, Communications		—	—	2	—	—	2	VI-C
VII Biology and Public Health		—	—	2	—	—	2	VII
VIII Physics		1	—	—	1	1	3	VIII
IX-A General Science		—	—	—	1	—	1	IX-A
IX-B General Engineering		—	2	2	2	—	6	IX-B
X Chemical Engineering		3	1	1	4	1	10	X
X-A Chemical Engineering Practice		—	—	—	—	1	1	X-A
XII Geology		—	1	—	—	—	1	XII
XIII Naval Architecture & Marine Eng.		1	—	3	—	—	4	XIII
XIII-C Ship Operation		—	—	1	—	—	1	XIII-C
XIV Electrochemical Engineering		—	1	—	—	—	1	XIV
XV Business and Eng. Administration		3	6	3	2	4	18	XV
XVI Aeronautical Engineering		2	1	—	2	2	7	XVI
XVII Building Eng. and Construction		1	—	2	—	—	3	XVII
XVIII Mathematics		—	—	1	—	—	1	XVIII
Unclassified		—	—	2	—	—	2	Unc.
Total		18	16	26	19	39	118	

*Excluding 6 Special Students.

TABLE 5

Classification of Students by Courses since 1927

	1927–28	1928–29	1929–30	1930–31	1931–32	1932–33	1933–34	1934–35
Engineering Courses . . . *Total*	2,240	2,305	2,405	2,564	2,495	2,197	2,008	1,961
Aeronautical Engineering XVI	170	224	278	233	193	193	162	183
Architectural Engineering IV-A	90	84	73	72	53	34	31	23
Building Engineering and Construction XVII	66	90	102	82	67	45	43	31
Business and Engineering Administration XV	307	303	299	347	378	371	343	305
Chemical Engineering X, X-A, X-B	300	318	384	404	402	315	323	356
Civil Engineering I, I-A	233	260	240	236	224	175	142	129
Electrical Engineering VI, VI-A, VI-C	554	513	484	523	502	443	395	380
Electrochemical Engineering XIV	55	50	47	37	45	42	35	38
Fuel and Gas Engineering	14	13	7	11	9	—	—	—
General Engineering IX-B	32	30	37	46	43	32	35	52
Mechanical Engineering II	297	283	303	369	344	315	270	255
Military Engineering	—	—	—	—	—	—	—	—
Mining Engineering and Metallurgy III	51	51	67	105	114	94	100	82
Naval Architecture and Marine Eng. XIII, XIII-C	39	55	56	71	89	93	90	90
Naval Construction XIII-A	15	12	14	15	20	34	26	25
Sanitary Engineering XI	17	19	14	13	12	11	13	12
Science Courses . . . *Total*	248	291	341	378	439	439	439	405
Biology and Public Health VII	51	68	93	99	100	94	92	81
Chemistry V	108	123	118	146	158	146	145	137
General Science IX-A	10	11	13	9	4	10	12	10
Geology XII	14	26	24	17	20	20	21	16
Mathematics XVIII	18	19	24	29	32	31	28	35
Physics VIII	47	44	69	78	125	138	141	126
Architecture IV, IV-B . . . *Total*	189	218	228	200	190	159	135	120
Army Ordnance . . . *Total*	10	9	11	11	10	11	9	9
Unclassified . . . *Total*	25	45	81	56	54	25	15	12
Grand Total	2,712	2,868	3,066	3,209	3,188	2,831	2,606	2,507

TABLE 6
GEOGRAPHICAL CLASSIFICATION OF STUDENTS SINCE 1930

UNITED STATES	1930	1931	1932	1933	1934
North Atlantic . . . . . Total	2,361	2,375	2,178	2,050	1,919
Connecticut	76	81	72	69	76
Maine	41	54	45	38	37
Massachusetts	1,612	1,558	1,373	1,264	1,148
New Hampshire	32	39	41	37	33
New Jersey	109	113	118	122	136
New York	322	345	347	337	326
Pennsylvania	107	114	111	119	110
Rhode Island	43	54	55	49	36
Vermont	19	17	16	15	17
South Atlantic . . . . . Total	156	143	130	94	82
Delaware	15	12	8	4	4
District of Columbia	46	43	53	35	32
Florida	11	10	6	3	3
Georgia	5	4	2	1	2
Maryland	19	22	19	14	19
North Carolina	13	10	8	7	5
South Carolina	5	4	3	3	2
Virginia	33	27	27	24	12
West Virginia	9	11	4	3	3
South Central . . . . . Total	86	81	52	45	51
Alabama	6	11	7	4	2
Arkansas	6	3	2	2	2
Kentucky	13	12	10	7	9
Louisiana	10	10	8	7	9
Mississippi	5	4	4	2	2
Tennessee	11	11	5	8	7
Texas	35	30	16	15	20
North Central . . . . . Total	302	286	250	226	238
Illinois	83	64	58	54	66
Indiana	17	16	13	10	12
Iowa	8	11	7	6	7
Kansas	15	11	11	7	6
Michigan	43	27	28	19	21
Minnesota	20	20	14	18	17
Missouri	36	37	37	34	33
Nebraska	7	8	7	5	4
North Dakota	3	6	2	4	1
Ohio	58	66	58	55	52
South Dakota	—	—	2	—	1
Wisconsin	12	20	13	14	18
Western . . . . . Total	103	109	78	74	90
Arizona	3	4	1	2	2
California	30	39	31	24	32
Colorado	22	18	11	11	15
Idaho	2	3	2	2	1
Montana	8	6	4	3	3
Nevada	—	1	—	—	—
New Mexico	2	1	—	4	4
Oklahoma	8	7	7	7	6
Oregon	5	9	4	6	8
Utah	3	1	4	4	1
Washington	18	19	13	11	18
Wyoming	2	1	1	—	—
Territories and Dependencies . Total	20	12	8	8	5
Alaska	1	1	1	—	—
Canal Zone	—	1	1	1	—
Hawaii	4	5	4	4	3
Philippine Islands	6	3	—	1	—
Porto Rico	8	2	2	2	2
Virgin Islands	1	—	—	—	—
Total for United States	3,028	3,006	2,696	2,497	2,385

TABLE 6 (*Continued*)

Foreign Countries	1930	1931	1932	1933	1934
Total	181	182	135	109	122
Argentine Republic	—	1	1	1	3
Australia	1	2	2	1	—
Austria	1	1	1	1	3
Bahamas	1	—	—	—	—
Belgium	1	2	3	1	2
Bermuda	—	—	—	1	1
Brazil	2	—	—	—	2
British West Indies	1	2	1	1	2
Canada	32	34	26	31	24
Chile	1	1	1	1	1
China	24	17	16	12	28
Colombia	6	6	5	5	3
Costa Rica	2	1	—	—	—
Cuba	10	14	9	8	7
Czechoslovakia	—	1	—	—	—
Denmark	1	1	1	—	—
Dominican Republic	1	—	—	—	—
Dutch East Indies	—	—	1	—	1
Ecuador	1	2	1	—	1
Egypt	2	1	—	—	—
England	7	3	1	3	3
Esthonia	1	—	—	—	—
France	5	4	4	2	2
Germany	7	5	2	2	2
Greece	1	—	—	—	—
Guatemala	1	—	—	—	—
Hungary	—	—	1	—	—
India	12	6	6	3	6
Irak	—	2	3	1	2
Ireland	1	1	1	1	1
Italy	2	—	—	—	1
Japan	6	5	4	3	7
Java	—	—	—	1	—
Lithuania	1	2	—	—	—
Manchukuo	—	—	—	2	—
Mexico	13	13	6	5	5
Netherlands	—	—	—	—	1
Newfoundland	—	—	—	—	1
Norway	2	2	2	3	1
Palestine	3	4	3	1	—
Panama	7	3	3	1	2
Peru	1	3	2	—	—
Poland	—	1	1	1	—
Salvador	2	2	1	1	—
Scotland	—	1	—	—	—
Siam	4	3	1	1	1
South Africa, Union of	3	4	4	2	2
Spain	6	2	—	1	—
Straits Settlements	1	—	—	—	—
Sweden	2	2	—	2	—
Switzerland	1	1	—	1	3
Syria	2	—	2	—	1
Turkey	1	—	—	—	1
Union Socialistic Soviet Republic	—	25	20	8	1
Venezuela	2	2	—	1	1
Grand Total, United States and Foreign	3,209	3,188	2,831	2,606	2,507

TABLE 7
Women Students Classified by Courses and Years

COURSE	YEAR					Total
	1	2	3	4	G	
IV Architecture	2	—	2	2	—	6
IV-A Architectural Engineering	—	—	2	—	—	2
IV-B City Planning	—	—	—	1	—	1
V Chemistry	3	2	1	—	4	10
VI-C Electrical Engineering (Communications)	—	—	1	—	—	1
VII Biology and Public Health	—	1	2	1	4	8
VIII Physics	1	—	—	1	3	5
IX-A General Science	—	—	—	1	—	1
X Chemical Engineering	1	—	—	—	1	2
XII Geology	—	1	—	—	—	1
XVI Aeronautical Engineering	—	1	—	—	—	1
XVIII Mathematics	—	—	—	1	—	1
Unclassified	—	1	—	—	—	1
Total	7	6	8	7	12	40

TABLE 8
Old and New Students

Year	1929–30	1930–31	1931–32	1932–33	1933–34	1934–35
Students registered at end of last academic year (including specials)	1,861	1,938	1,949	1,866	1,748	1,568
Students who have previously attended the Institute, but were not registered at end of last academic year	152	165	231	126	120	124
New students who entered by examination	549	609	526	403	241	214
New students who entered without examination	—	—	—	89	187	253
New students who entered from other colleges as candidates for degrees	434	421	395	289	266	302
New students (specials, not candidates for degrees)	70	76	87	58	44	46
Total	3,066	3,209	3,188	2,831	2,606	2,507

TABLE 8-A
New Students Admitted by Examination

Status of Admission	Year of Entrance				
	1930	1931	1932	1933	1934
Clear	419	373	288	164	129
1 Condition	110	81	72	47	51
2 Conditions	57	48	31	24	24
3 Conditions	21	16	7	6	7
More than 3 Conditions	2	8	5	—	3
Total	609	526	403	241	214

TABLE 9

LIST OF AMERICAN COLLEGES AND UNIVERSITIES, WITH NUMBER OF GRADUATES ATTENDING THE INSTITUTE

College		College		College	
Alabama Polytechnic Inst.	2	Mount Holyoke College	2	University of Illinois	8
Alfred University	1	Mich.Col.ofMining&Tech.	1	University of Kansas	2
Amherst College	4	Miss. State College	1	University of Kentucky	2
Armour Inst. of Tech.	2	Missouri Valley College.	1	University of Maine	8
Barnard College	1	New York University	5	University of Maryland	1
Bates College	2	Niagara University	1	University of Michigan	1
Boston College	4	North Dakota Agric.Col.	1	University of Minnesota	2
Boston University	1	North Dakota State Col.	1	University of Missouri	1
Bowdoin College	2	Northeastern University	6	University of Montana	2
Brown University	3	Norwich University	1	Univ.of New Hampshire	1
California Inst. of Tech.	1	Occidental College	1	Univ. of North Carolina	2
Carleton College	2	Ohio State University	3	University of Notre Dame	3
Carnegie Inst. of Tech.	1	Oregon State Agri. Col.	3	University of Oregon	3
Case School of App. Sci.	3	Parsons College	1	Univ. of Pennsylvania	6
Colby College	2	Pennsylvania State Col.	6	University of Pittsburgh	2
Colgate University	2	Poly. Inst. of Brooklyn	3	University of Redlands	1
College of City of N. Y.	2	Pomona College	2	University of Richmond	2
College of Wooster	1	Princeton University	4	University of Rochester	1
Colorado College	3	Purdue University	3	Univ. of Southern Calif.	1
Cooper Union Inst.ofTech.	1	Radcliffe College	1	Univ. of Tennessee	3
Cornell University	6	Rensselaer Poly. Inst.	2	University of Texas	6
Dartmouth College	8	Rhode Island State Col.	2	University of Toledo	1
Davidson College	1	Rice Institute	2	University of Utah	1
De Pauw University	1	Rutgers University	1	University of Vermont	1
Drexel Institute	2	St. Olaf College	2	University of Virginia	4
Eastern Nazarene College	1	Simmons College	2	University of Washington	8
Franklin&Marshall College	1	Smith College	1	University of Wisconsin	2
Georgia School of Tech.	3	Southern Methodist Univ.	1	Vassar College	1
Hampden-Sidney College	2	Stanford University	10	Virginia Military Inst.	2
Harvard University	15	State Col. of Wash.	1	Washington & Lee Univ.	2
Haverford College	1	Stevens Inst. of Tech.	1	Washington State Col.	4
Hillsdale College	1	Swarthmore College	4	Wellesley College	2
Illinois College	1	Temple University	2	Wesleyan College	4
Iowa State Col.of A.&M.A.	1	Texas Tech. College	1	Willamette University	2
Johns Hopkins Univ.	2	Trinity College (Conn.)	1	Williams College	6
Kenyon College	2	Tufts College	10	Wittenberg College	1
Lafayette College	2	Tulane University	2	Worcester Poly. Inst.	8
Lehigh University	3	Union College	1	Yale University	9
Louisiana Poly. Inst.	1	U. S. Military Academy	16	Total	585
Louisiana State Univ.	1	U. S. Naval Academy	30		
Loyola University	2	University of Arizona	2	Number of American Colleges Represented	132
Mass. Col. of Pharmacy	1	University of California	3	Number of Foreign Colleges Represented(Not listed)	35
Mass. Inst. of Tech.	209	University of Chicago	3	Total	167
Mass. State College	2	University of Cincinnati	2		
Miami University	2	University of Colorado	3		
Middlebury College	2	University of Dayton	1		
Montana State College	1	University of Denver	2		

TABLE 10

NEW STUDENTS ENTERING FROM OTHER COLLEGES AS CANDIDATES FOR DEGREES

Class Joined at the Institute	Years Spent at College				Total
	One	Two	Three	Four or more	
First year	27	20	2	5	54
Second year	9	28	6	12	55
Third year	—	8	6	20	34
Fourth year	—	1	—	6	7
Graduate year	—	—	3	149	152
Total	36	57	17	192	302

TABLE 11

Regular Students from Colleges Classified by Courses

COURSE	No Previous Degree			Graduates of Other Colleges					Graduates of M. I. T. Taking Graduate Work		
	Entered		Total	Entered				Total	S. B. Degree June 1934	Other Graduates	Total
				Sept. 1934		Previous Years					
	Sept. 1934	Previous Years		Undergrad.	Grad.	Undergrad.	Grad.				
Aeronautical Engineering XVI	6	14	20	4	6	1	9	20	5	4	9
Architectural Engineering IV-A	1	3	4	—	1	1	—	2	1	1	2
Architecture IV, IV-B	8	17	25	5	11	5	—	21	2	3	5
Army Ordnance	—	—	—	—	9	—	—	9	—	—	—
Biology and Public Health VII	—	6	6	—	4	—	4	8	1	7	8
Building Engineering and Construction XVII	3	2	5	1	—	1	—	2	—	—	—
Business and Eng. Administration XV	6	30	36	1	8	3	3	15	2	3	5
Chemical Engineering X, X-A, X-B	16	24	40	—	41	1	26	68	10	1	11
Chemistry V	3	2	5	—	6	—	26	32	4	17	21
Civil Engineering I	10	13	23	2	12	1	5	20	1	4	5
Electrical Engineering VI, VI-A, VI-C	26	24	50	6	22	4	19	51	25	9	34
Electrochemical Engineering XIV	—	—	—	—	1	—	—	1	2	1	3
General Engineering IX-B	2	7	9	—	—	1	—	1	—	—	—
General Science IX-A	2	1	3	—	—	—	—	—	—	—	—
Geology XII	—	1	1	—	1	—	4	5	—	2	2
Mathematics XVIII	3	1	4	—	1	—	1	2	3	5	8
Mechanical Engineering II	15	19	34	3	16	3	9	31	4	8	12
Mining Engineering and Metallurgy III	3	4	7	—	5	—	5	10	4	7	11
Naval Architecture XIII, XIII-C	4	7	11	1	—	3	—	4	1	—	1
Naval Construction XIII-A	—	—	—	8	—	7	10	25	—	—	—
Physics VIII	2	5	7	1	8	—	28	37	10	11	21
Sanitary Engineering XI	—	1	1	—	—	—	—	—	1	2	3
Unclassified	8	1	9	—	—	—	—	—	—	—	—
Total	118	182	300	32	152	31	149	364	76	85	161

TABLE 12
Number of Degrees Awarded in December, 1934 and June, 1935

Name of Course	S.B.		B.Arch.		S.M.		M.Arch.		Ph.D.		Sc.D.		Totals	
	Dec. '34	June '35	Dec. '34	June '35	Dec. '34	June '35	Dec. '34	June '35	Dec. '34	June '35	Dec. '34	June '35	Dec. '34	June '35
Aeronautical Engineering	2	26	—	—	1	3	—	—	—	—	—	—	3	29
Architectural Engineering	2	8	—	—	—	1	—	—	—	—	—	—	2	9
Architecture	—	—	6	15	—	—	—	2	—	—	—	—	6	17
Biology	—	1	—	—	—	—	—	—	—	4	—	—	—	5
Biology and Public Health	1	6	—	—	—	1	—	—	—	—	—	—	1	7
Building Engineering and Construction	1	7	—	—	—	—	—	—	—	—	—	—	1	7
Business and Engineering Administration	2	69	—	—	1	2	—	—	—	—	—	—	3	71
Ceramics	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Chemical Engineering	6	42	—	—	3	12	—	—	—	—	—	2	9	56
Chemical Engineering Practice	—	5	—	—	4	12	—	—	—	—	—	—	4	17
Chemistry	1	14	—	—	3	3	—	—	2	11	—	—	6	28
City Planning	—	—	—	3	—	—	—	—	—	—	—	—	—	3
Civil Engineering	5	14	—	—	3	8	—	—	—	—	—	—	8	22
Electrical Engineering (Inc. VI-A)	12	62	—	—	5	42	—	—	—	—	1	3	18	107
Electrochemical Engineering	1	8	—	—	—	1	—	—	—	—	1	—	2	9
General Engineering	1	15	—	—	—	—	—	—	—	—	—	—	1	15
General Science	—	4	—	—	—	—	—	—	—	—	—	—	—	4
Geology	1	1	—	—	—	—	—	—	—	2	—	—	1	3
Industrial Biology	1	7	—	—	1	—	—	—	—	—	—	—	2	7
Mathematics	—	3	—	—	—	3	—	—	—	3	—	2	—	11
Mechanical Engineering	6	43	—	—	8	13	—	—	—	—	—	—	14	56
Metallurgy	1	6	—	—	1	6	—	—	—	—	—	—	2	12
Meteorology	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Military Engineering	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mining Engineering	1	8	—	—	—	1	—	—	—	—	—	—	1	9
Naval Architecture and Marine Engineering	—	8	—	—	—	—	—	—	—	—	—	—	—	8
Naval Construction	—	—	—	—	—	10	—	—	—	—	—	—	—	10
Physics	—	18	—	—	—	7	—	—	—	5	—	1	—	31
Public Health Engineering	—	2	—	—	—	—	—	—	—	—	—	—	—	2
Sanitary Engineering	—	1	—	—	1	2	—	—	—	—	—	1	1	4
Ship Operation	—	4	—	—	—	—	—	—	—	—	—	—	—	4
Without Course Classification	—	—	—	—	7	13	—	—	—	—	—	—	7	13
Totals	44	382	6	18	38	140	—	2	2	25	2	11	92	578

TABLE 13

DEGREES OF BACHELOR OF SCIENCE ACCORDING TO CLASS IN WHICH THEY WERE AWARDED

Class	Aeronautical Eng.	Architectural Eng.‡	Architecture	Biology or Natural History	Bldg. Eng. & Constr.	Business and Eng. Admin.	Chemical Eng.	Chemical Eng. Practice X-B	Chemistry	Civil Engineering	Electrical Eng. (Inc. VI-A)	Electrochemical Engineering*	General Eng.	General Science or General Course	Geology	Mathematics	Mechanical Eng.	Military Eng.	Mining Eng. and Metallurgy	Naval Arch.	Physics	Sanitary Eng.	Total	Total by Decades
1868	—	—	—	—	—	—	—	—	—	6	—	—	—	1	—	—	1	—	6	—	—	—	14	
1869	—	—	—	—	—	—	—	—	1	2	—	—	—	—	—	—	2	—	—	—	—	—	5	
1870	—	—	—	—	—	—	—	—	1	4	—	—	—	1	—	—	2	—	2	—	—	—	10	29
1871	—	—	—	—	—	—	—	—	2	8	—	—	—	—	—	—	2	—	5	—	—	—	17	
1872	—	—	—	—	—	—	—	—	3	3	—	—	—	—	—	—	1	—	5	—	—	—	12	
1873	—	—	1	—	—	—	—	—	7	12	—	—	—	1	—	—	2	—	3	—	—	—	26	
1874	—	—	1	—	—	—	—	—	—	10	—	—	—	2	—	—	4	—	1	—	—	—	18	
1875	—	—	1	—	—	—	—	—	1	10	—	—	—	2	—	—	7	—	6	1	—	—	28	
1876	—	—	1	2	—	—	—	—	5	12	—	—	—	4	—	—	8	—	8	3	—	—	43	
1877	—	—	4	—	—	—	—	—	2	12	—	—	—	—	—	—	6	—	8	—	—	—	32	
1878	—	—	3	—	—	—	—	—	3	8	—	—	—	1	—	—	2	—	2	—	—	—	19	
1879	—	—	1	1	—	—	—	—	3	6	—	—	—	—	—	—	8	—	3	1	—	—	23	
1880	—	—	—	—	—	—	—	—	1	3	—	—	—	1	—	—	—	—	3	—	—	—	8	226
1881	—	—	3	1	—	—	—	—	8	3	—	—	—	2	—	—	5	—	6	—	—	—	28	
1882	—	—	3	1	—	—	—	—	6	2	—	—	—	1	—	—	5	—	5	1	—	—	24	
1883	—	—	1	—	—	—	—	—	3	3	—	—	—	—	—	—	7	—	5	—	—	—	19	
1884	—	—	—	—	—	—	—	—	12	5	—	—	—	—	—	—	6	—	13	—	—	—	36	
1885	—	—	2	—	—	—	—	—	4	4	2	—	—	1	—	—	7	—	8	—	—	—	28	
1886	—	—	1	1	—	—	—	—	7	9	10	—	—	1	—	—	23	—	7	—	—	—	59	
1887	—	—	1	1	—	—	—	—	9	10	8	—	—	3	—	—	17	—	8	1	—	—	58	
1888	—	—	5	3	—	—	—	—	10	11	17	—	—	1	—	—	25	—	4	1	—	—	77	
1889	—	—	3	1	—	—	—	—	8	14	17	—	—	2	—	—	24	—	5	1	—	—	75	
1890	—	—	5	3	—	—	—	—	13	25	18	—	—	6	—	—	28	—	3	2	—	—	103	507
1891	—	—	6	3	—	—	7	—	11	18	23	—	—	1	1	—	26	—	4	3	—	—	103	
1892	—	—	13	6	—	—	4	—	7	22	36	—	—	7	1	—	26	—	4	1	6	—	133	
1893	—	—	2	2	—	—	8	—	8	25	41	—	—	6	2	—	30	—	5	—	—	—	129	
1894	—	—	14	1	—	—	12	—	11	21	33	—	—	5	—	—	31	—	4	3	3	—	138	
1895	—	—	15	—	—	—	11	—	14	25	33	—	—	4	—	—	30	—	3	5	2	4	146	
1896	—	—	24	3	—	—	7	—	17	26	48	—	—	7	3	—	34	—	10	5	3	4	191	
1897	—	—	16	2	—	—	12	—	20	25	33	—	—	7	1	—	40	—	7	9	3	4	179	
1898	—	—	29	3	—	—	9	—	25	32	33	—	—	6	—	—	41	—	7	7	4	3	199	
1899	—	—	22	2	—	—	10	—	22	30	32	—	—	1	—	—	37	—	9	8	2	1	176	
1900	—	—	21	3	—	—	11	—	19	32	23	—	—	5	—	—	34	—	21	9	3	4	185	1,579
1901	—	—	21	1	—	—	14	—	17	37	25	—	—	6	1	—	39	—	18	16	1	4	200	
1902	—	—	18	5	—	—	9	—	14	24	35	—	—	3	—	—	46	—	14	14	3	7	192	
1903	—	—	15	1	—	—	10	—	13	26	39	1	—	1	1	—	37	—	27	12	3	4	190	
1904	—	—	24	3	—	—	7	—	15	34	34	8	—	5	1	—	45	—	32	17	5	2	232	
1905	—	—	12	3	—	—	13	—	23	46	31	3	—	3	1	—	54	—	26	24	—	5	244	
1906	—	—	22	2	—	—	10	—	21	47	37	3	—	—	—	—	69	—	38	19	4	6	278	
1907	—	—	21	—	—	—	14	—	10	37	32	5	—	—	2	—	52	—	22	10	—	3	208	
1908	—	—	19	4	—	—	15	—	16	48	38	2	—	—	—	—	62	—	19	5	—	2	230	
1909	—	—	18	5	—	—	13	—	12	51	42	3	—	—	—	—	41	—	30	5	3	9	232	
1910	—	—	18	3	—	—	18	—	10	57	36	3	—	2	—	—	57	—	24	11	—	12	251	2,257
1911	—	—	10	1	—	—	19	—	12	46	49	5	—	2	—	—	49	—	17	6	1	15	232	
1912	—	—	21	4	—	—	31	—	7	55	52	3	—	1	—	—	47	—	21	3	2	14	261	
1913	—	—	26	2	—	—	30	—	12	58	43	8	—	—	—	—	50	—	20	4	1	15	269	
1914	—	—	19	6	—	—	37	—	9	60	51	8	—	4	—	—	65	—	17	8	1	19	304	
1915	—	—	30	3	—	—	33	—	23	49	42	10	—	3	—	—	69	—	5	7	3	12	289	
1916	—	—	37	5	—	—	32	—	11	45	56	14	—	2	—	—	84	—	5	9†	3	18	321	
1917	—	—	27	10	—	37	43	—	13	49	45	10	—	5	2	—	63	—	14	9†	1	17	345	
1918	—	—	28	7	—	29	40	—	10	45	50	11	2	4	1	—	75	—	10	4	3	5	324	
1919	—	—	16	9	—	28	44	—	8	45	50	6	3	1	—	—	66	—	7	7	4	6	299	
1920	—	—	19	2	—	48	63	—	6	52	30	9	1	4	—	—	55	—	13	12	2	2	319	2,963
1921	—	—	11	3	—	70	92	—	9	98	75	15	15	—	—	3	128	—	24	18	1	3	565	
1922	—	—	32	8	—	126	98	15	11	65	109	25	25	1	8	—	56	—	27	16	8	7	637	
1923	—	13	18	6	—	115	73	19	16	64	78	16	23	2	8	3	106	—	23	13	9	3	608	
1924	—	6	15	6	—	82	57	8	13	69	125	17	36	4	2	1	82	—	19	11	3	1	557	
1925	—	6	18	2	—	94	53	8	18	57	110	9	37	2	3	2	98	—	23	10	5	—	555	
1926	—	9	24	5	—	95	45	13	19	76	108	14	33	2	4	1	76	—	20	14	1	2	561	
1927	2	15	19	6	—	89	39	6	13	73	121	8	22	2	3	3	72	1	9	4	4	3	514	
1928	8	19	16	5	—	73	38	7	13	59	114	11	12	2	1	3	67	—	12	3	3	5	471	
1929	29	25	26	7	9	69	37	11	18	46	84	10	14	1	2	5	64	—	11	5	4	6	483	
1930	29	15	44	9	23	59	39	12	11	46	76	8	9	1	2	1	48	—	6	6	11	4	459	5,410
1931	39	10	18	16	15	68	32	10	12	49	83	6	22	5	3	4	70	—	12	13	7	2	496	
1932	27	16	5	15	18	70	45	7	15	38	74	4	29	3	2	3	68	4	21	16	21	4	505	
1933	27	9	—	13	9	56	38	3	18	47	87	8	16	3	2	7	86	—	14	13	14	2	472	
1934	26	10	—	16	13	78	48	6	15	35	79	7	8	9	1	8	50	—	26	25	28	5	493	
§1935	26	8	—	16	7	69	42	5	14	14	43	8	15	4	1	3	43	—	14	12	18	1	363	
Total	213	161	865	248	94	1,355	1,362	130	740	2,185	2,590	278	322	166	62	44	2,760	5	830	424	212	254	15,300	

*Prior to 1909 this Course was designated as Option 3 (Electrochemistry) of Course VIII.
†Two received the degree in XIII-B in 1916 and three in 1917.
‡Prior to 1923 degrees were awarded in Architecture.
§Includes only June degrees awarded in Class 1935.

TABLE 14

Degrees of Master of Science Awarded

	Aeronautical Engineering	Architectural Engineering	Architecture	Biology and Pub. Health	Business and Eng. Admin.	Chemical Engineering	Chem. Eng. Practice	Chemistry	Civil Engineering	Electrical Eng. (Inc. VI-A)	Electrochemical Eng.	Fuel and Gas Eng.	General Science	Geology	Mathematics	Mechanical Engineering	Metallurgy	Meteorology	Mining Engineering	Naval Architecture	Naval Con., U. S. N.	Naval Con., Foreign Stud.	Physics	Railroad Operation	Sanitary Engineering	Without Course Classification	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			2										1						1					5
1899			1	1				1																			3
1900																											
1901			2													2											4
1902			3					3								2											8
1903			5													1									1		7
1904			4					1		2						1					3		1				12
1905			9																		8				1		18
1906			3					1												2	3						9
1907			6			1															8						15
1908			1					1		3											7						12
1909			6			1		1	2	1				1		1			2		3		1				19
1910			6	1				1	2	1						1					7						19
1911			5	2				2	2	4						2					3						20
1912			4	2				3	3	2									2		4				2		22
1913			4	1		7			1	1				1		2			1		2						20
1914			3	2		3		5	3	2				1		1					2				3		25
1915	1		4			2		2	1	10	1					4			1	1	2						29
1916	5		7	1		1		3	5	6	1					4					2	5			1		41
1917	4		3			1		1	3	5						1			1		9		1		2		31
1918	5		1	1		1		1	1	2						2			1							1	16
1919	2							3	4	4	1				1	1											16
1920				1		3		2	4	7	1			3	1	5			1		19		1			4	52
1921	3	1				29		6	2	4				2		10					20					17	94
1922	5	1				6	32	4	5	37	1			2	2	4			3		10		1			18	131
1923	10					3	34	1	5	45				2		15	1			4	21		3			26	170
1924	4					6	41	1	5	34	1			1		8	1		1		12		5			28	148
1925	5	1			1	3	35	3	5	35	1					10	2		1				2		1	21	126
1926	6	1				5	20	2	2	60	1			3		6	1				12					25	144
1927	9			1		2	26	4	6	54	2	2		6	1	13			2		6		1			32	167
1928	9					5	14	2	8	63	3	7			2	13					9		1			43	179
1929	5	1			2	3	21	4	6	79	2	6		4	2	16					6		2		1	45	205
1930	3	4			1	7	22	5	9	51	5	2		1	2	5	3		1	1	5		1		1	53	182
1931	4	3		2	5	15	34	5	12	57	2	4		2	5	10	4	4	2		8		2	3		20	203
1932	5			5	9	25	33	8	17	56	2	5		2	3	16	1	4	1		7		6	6		40	251
1933	10	2		1	5	14	26	7	12	46	2				1	18	2		1	1	13		4	3	2	20	190
1934	7			5	5	16	19	11	9	46				3	3	20	5	1	2		11		3	2	1	21	190
*1935	3	1		1	2	12	12	3	8	42	1				3	13	6		1		10		7		2	13	140
Total	105	15	84	27	30	174	369	101	143	759	27	26	1	34	26	208	26	9	24	9	232	5	45	14	18	427	2,938

* Includes only June degrees.

TABLE 15
DEGREES AWARDED IN ARCHITECTURE AND CITY PLANNING

Year	Bachelor in Architecture	Bachelor of Architecture in City Planning	Master in Architecture
1921	—	—	3
1922	—	—	2
1923	—	—	7
1924	—	—	8
1925	—	—	5
1926	—	—	9
1927	—	—	7
1928	—	—	6
1929	—	—	9
1930	—	—	7
1931	—	—	9
1932	11	—	5
1933	24	—	7
1934	27	—	—
*1935	15	3	2
Total	77	3	86

TABLE 16
DEGREES OF DOCTOR OF PHILOSOPHY AWARDED

Year	Biology	Chemistry	Geology	Mathematics	Physics	Total
1907	—	3	—	—	—	3
1908	—	3	—	—	—	3
1909	—	—	—	—	—	—
1910	—	1	1	—	—	2
1911	1	—	—	—	—	1
1912	—	3	3	—	—	6
1913	—	1	—	—	—	1
1914	—	2	—	—	—	2
1915	—	2	—	—	—	2
1916	—	1	1	—	1	3
1917	—	3	1	—	—	4
1918	—	3	1	—	—	4
1919	—	—	—	—	1	1
1920	—	4	1	—	—	5
1921	1	3	—	—	3	7
1922	—	4	1	—	—	5
1923	—	5	1	—	—	6
1924	2	10	—	—	2	14
1925	—	11	—	—	—	11
1926	—	2	2	—	—	4
1927	2	6	1	1	1	11
1928	1	5	1	1	—	8
1929	4	8	2	1	—	15
1930	—	5	2	3	—	10
1931	—	9	—	1	—	10
1932	1	12	—	1	2	16
1933	2	10	3	3	—	18
1934	2	10	2	2	1	17
*1935	4	11	2	3	5	25
Total	20	137	25	16	16	214

*Includes only June degrees.

TABLE 17

Degrees of Doctor of Science Awarded

Year	Aero. Eng.	Ceramics	Chem. Eng.	Chemistry	Civil Eng.	Elec. Eng.	Electrochem. Eng.	Geology	Mathematics	Mech. Eng.	Metallurgy	Meteorology	Min. Eng.	Naval Arch.	Physics	San. Eng.	Total
1911. . .	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1
1912. . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1913. . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1914. . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1915. . .	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1
1916. . .	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1917. . .	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1
1918. . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1919. . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1920. . .	1	—	—	—	—	—	—	1	—	—	—	—	1	—	—	—	3
1921. . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1922. . .	1	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	3
1923. . .	1	—	—	—	—	—	—	1	—	—	1	—	—	—	2	—	5
1924. . .	—	—	2	—	—	1	—	1	—	—	1	—	—	—	1	—	6
1925. . .	1	—	3	—	—	—	—	—	—	—	3	—	—	—	—	—	7
1926. . .	—	—	1	1	1	1	1	—	—	—	4	—	—	—	—	—	9
1927. . .	—	—	—	—	—	1	—	—	1	1	2	—	—	—	1	—	6
1928. . .	1	—	5	—	1	2	—	—	—	—	1	—	—	—	—	—	10
1929. . .	—	—	3	—	—	—	—	—	—	—	1	—	—	1	1	—	6
1930. . .	—	—	9	—	—	6	—	—	1	3	1	—	—	—	—	—	20
1931. . .	—	—	3	2	—	3	—	—	—	—	1	—	—	—	—	—	9
1932. . .	—	—	5	—	1	2	—	1	—	2	1	—	—	—	2	—	14
1933. . .	—	—	10	1	2	3	—	—	1	—	6	—	1	—	—	—	24
1934. . .	—	—	3	—	—	2	1	1	—	3	2	1	—	—	—	—	13
*1935. . .	—	1	2	—	—	3	—	—	2	—	—	1	—	—	1	1	11
Total .	6	1	46	5	5	28	2	5	5	9	24	2	2	1	8	1	150

* Includes only June degrees.

TABLE 18

DEGREES OF DOCTOR OF PUBLIC HEALTH AWARDED

Year	Number
1924	1
1927	1
1928	1
1930	1
Total	4

TABLE 19

DEGREES OF DOCTOR OF ENGINEERING AWARDED (*Discontinued after 1918*)

Year	Electrical Engineering	Electrochemical Engineering	Total
1910	1	—	1
1914	1	—	1
1916	1	—	1
1917	—	1	1
Total	3	1	4

TABLE 20

SUMMARY OF DEGREES AWARDED (1868–1935)

Bachelor of Science	15,300
Bachelor in Architecture	80
Master of Science	2,938
Master in Architecture	86
Doctor of Philosophy	214
Doctor of Science	150
Doctor of Public Health	4
Doctor of Engineering (Discontinued after 1918)	4
Grand Total	18,776

J. C. MACKINNON.

Summer Session. The registration for the Summer Session 1935 showed an increase for the first time since 1930. The total registration was 1,005, an increase of 79, or 9 per cent over last year.

The program of subjects offered was again limited almost entirely to the regularly scheduled subjects. As economic conditions are improving, it would be advisable next year to resume offering some special programs of subjects in both science and engineering to supplement the regularly scheduled subjects.

J. C. MACKINNON,
For the Committee on Summer Session.

The Librarian. For the first time in many years the home use of the Institute Library showed a falling-off. This was, however, a decrease of but 1½ per cent, and the total circulation, 76,406, is still considerably higher than that of two years ago. These figures refer, as in most college libraries, to one- or two-week circulation. There might be mentioned, therefore, the fact that very nearly 15,000 volumes additional were lent for overnight or week-end use. In the Eastman Library, for example, overnight circulation is one-fourth larger than that for one- or two-week periods. Circulation figures often reflect changes in course enrollment, changes in teaching methods, or changes in research projects. For example, although the Lindgren Library reported a drop in circulation there was a sizable increase in the attendance of readers for the use of books in the room, apparently due to changes of method in certain courses.

Alumni used the Library in increasing numbers; at the Central Library 540 alumni registered as borrowers.

The addition to the Library of 8,859 volumes, about the annual average, brought the total contents up to 304,856. A careful count of the Lindgren Library showed a total of 10,718 volumes and 5,657 maps; this branch has therefore the second largest book collection of the branch libraries, being exceeded only by Walker Memorial Library with 11,000 volumes.

In interlibrary loan we borrowed 248 volumes from other libraries and lent 1,008, of which 386 were lent to college, public and government libraries, and 622 to the libraries of business and industrial concerns. In order to recoup the Library for expense incurred in borrowing material from outside libraries, and in accordance with a vote of the Library Committee, a fee of fifty cents per borrowing was charged, both to individual borrowers and to departments.

The development of a method of binding periodicals in strong paper covers, which can be done very cheaply by student labor, enabled us to improve the condition of many periodical files which would not otherwise have been bound. About 450 volumes, including over 300 volumes of the Official Gazette of the U. S. Patent Office, were cared for in this manner.

The Eastman Librarian reports an increase in registration of regular users from 667 to 790. One interesting fact is that those registered from the three courses primarily served by the

library, namely Physics, Chemistry and Mathematics, are outnumbered nearly one-third by those from other courses. This library still suffers from the depression, since it has been necessary to deprive the Eastman Librarian of her assistant, who was transferred to the Central Library to reinforce the reduced staff there. Under such conditions the Eastman Librarian becomes a desk attendant merely, with scant opportunity for bibliographical work, consultation with department staffs, or other work of a constructive nature. When times are better this condition should be remedied by the restoration of the assistant.

The Vail Library suffered a serious loss by the resignation of Mrs. Katharine Maynard, who through nine years of notable accomplishment had brought the Vail librarianship to a high standard and a remarkable volume of service. Her successor, Mrs. Ruth McG. Lane, had been Mrs. Maynard's predecessor in the same capacity and thus comes to the work with previous knowledge of its problems.

The Civil Engineering-Economics Library experienced added activity as a result of the transfer to it of many bound periodical sets from the Central Library (which required the provision of additional stacks) and because of more general assignment of reading by professors in Economics and Course XV subjects.

Continued helpful coöperation from the Undergraduate Employment Bureau enabled us to obtain a higher grade of student assistants than ever before, including additional help from F.E.R.A. students on work that would otherwise have been postponed for lack of funds.

The Library Committee for the year consisted of Professors Lewis (chairman), Franklin, Sherwood, Crosby, Ingraham, and R. R. Lawrence, and the Librarian ex officio. Effective work was done by a sub-committee, consisting of Professors Sherwood and Franklin, in the consideration and recommendation of budget needs. As one result of its investigations a larger sum was appropriated for book purchase for next year, and the scale of departmental allotments for books was revised upward.

The creation early in the year of a Corporation Visiting Committee on the Library was welcome recognition of the growing importance of the Library in the work of the Insti-

tute. The committee consists of Dr. Harlow Shapley (chairman), Walter Humphreys, '97, and Donald G. Robbins, '07. The possibility of organizing a "Friends of the Institute Library" group, similar to those that have proved helpful to other university libraries, has already had consideration by the committee.

For Alumni Reunion Day, June 3, the Reference Librarian and her assistant prepared a record of books published by alumni, 1930–35, which was issued as a printed booklet under the title "A Technology Bookshelf" and presented to all alumni attending. A list of new books and new editions by members of the Instructing Staff during the same period was prepared in typewritten form. A list "The Engineer's Contact with Social Problems," prepared at the same time, was printed in the *Technology Review* of July 1935.

The Institute Library took part in entertaining the national Special Libraries Association, which met in Boston June 11–14. About fifty delegates visited the Institute, were conducted about the buildings by guides from the Library staff, and were served tea in the Emma Rogers Room. At the opening session in Boston the main address was delivered by Dr. Compton, its title being "Government Participation in Scientific Work." Papers were read at section meetings by the Librarian, by Mrs. Lane and by Miss Hazen.

Most noteworthy among the gifts of the year was a collection of 504 books on architectural subjects, presented to the Architectural Library by Henry Forbes Bigelow of the Class of 1888.

From Charles F. Hopewell, '93, the Library received 244 books and bound volumes of journals, besides many unbound, the greater part in the field of internal combustion engineering.

To Dr. A. E. Kennelly the Library is indebted for a copy of the miniature book "Galileo a Madama Christina di Lorena," which attracted some public interest as the result of newspaper publicity. Originally a letter written in 1615, this miniature was printed in Padua in 1896.

The regular gift of the publications of other universities, institutions and societies, formerly received in exchange, has been stopped in some instances because of the discontinuance of the Institute's *Contributions* and *Abstracts* series in July 1932.

The amount of loss is not serious, and we have met it in some cases by special arrangements with individual departments for the sending of their reprints. It suggests, however, the need for a unified mechanism of exchange for the Institute as a whole, the Library to be the designated depository of material thus received.

One of the satisfactions of Institute Library work is to hear frequently from alumni, directly or indirectly, words of appreciation of the library service rendered them as students. Expressions of appreciation from visiting scholars are frequent. Nevertheless, no one is more keenly aware of the present imperfections of our service than the Librarian and staff, and no one more anxious for its improvement. Every effort is made to maintain our collections as complete as our means allow, and to staff the libraries only with professionally trained, alert and effective assistants. The assistance of the Library Committee has been valuable and much is to be hoped for from the coöperation of the Visiting Committee. A "Friends of the Institute Library" group would be of invaluable aid. The current experience of other university libraries is a constant source of suggestions for the more effective solving of our problems. Yet most helpful of all would be constant, frank criticism from members of the Instructing Staff, accompanied by constructive suggestions. The Librarian asks especially for this kind of coöperation during the coming year.

W. N. SEAVER.

Medical Director. The only general illness of the year was an epidemic of German measles, which at one time reached quite serious proportions, but was not as extensive as in some other institutions. The cases were mild in nature and caused only a comparatively short period of disability.

No new departures from the routine were instituted during the year but the quality of the work was improved as far as possible.

The following figures indicate the service rendered and show the value of this health service to the great Technology family:

Daily Clinic Calls

July	379	January	1,567	
August	353	February	1,838	
September	1,209	March	2,034	
October	3,321	April	1,972	
November	1,295	May	1,657	
December	1,111	June	508	
				17,244
Number of men having defects — consequently examined more than once				710

Infirmary Calls

Bed patients	326	
Out-patients (after hours, Sundays and holidays)	861	
		1,187
		19,141

Number surgical cases Out-Patient Department	7,325	
Number medical cases Out-Patient Department	5,771	
Contagious cases	138	
Excuses for absence due to illness	1,699	
Physical examinations	2,311	
		17,244
Number surgical cases infirmary	73	
Number medical cases infirmary	253	
Number days spent in infirmary	1,573	

There were 241 X-rays taken during the year 1934–35.

The average number of days lost per student this year was 2⅕ days, as compared with an average of 2½ days lost in 1933–34.

Each undergraduate student must have a physical examination at the beginning of each academic year and no student is allowed to enter athletics without a card showing that he has passed his examination and is physically fit to enter competitive sports. This also applies to Physical Training and Military Science. Of 2,311 men examined 977 were found to have physical defects of some sort, and of this group 710 were reëxamined and followed up so that measures would be taken to correct these defects.

The Laboratory has had a very busy year, having done blood counts, cultures and laboratory work on 801 students.

The Dean's Office has been advised daily as to the health of the student body and all absences have been carefully and immediately checked up from a medical standpoint. The parents of the boys who were ill were notified and kept advised as to their condition.

Fewer calls were made in the Medical Department this year — probably due to the fact that no influenza epidemic appeared, as in previous years. Under our present system the health of the student body medically and surgically has been very satisfactorily controlled.

As soon as conditions warrant, it is my hope that the Department may enlarge its scope by adding a Psychiatric Department and a Dental Department. This has been provisionally planned and is awaiting action. These additions have been duly considered by the Visiting Committee.

I believe that the physical well-being of the men is well cared for, but the mental and psychiatric phase of the work has not been developed as it should be.

The Athletic Department has been most successful and 241 freshmen entered competitive sports, the remaining 265 men taking the required Physical Training in the gymnasium. No casualties of a serious nature have been recorded in the Athletic Department and the Physical Director and Coaches have been very efficient and thorough in their work. It is hoped that at some time a swimming tank may be added to the equipment of the Athletic Department.

GEORGE W. MORSE, M.D.

Industrial Coöperation. The year has brought to the Division of Industrial Coöperation a distinctly greater amount of research and development work, and also a larger financial return than for a considerable number of years.

More than ever before we have been able to discriminate by rejecting problems which were of the nature of routine testing, and confining ourselves to those problems which were of a distinctly research type, or were of such a nature that the experience of our staff or our unique equipment made it possible for us to carry out the work in a manner more satisfactory than would have been possible in other institutions. This pro-

cedure has now been followed for more than two years, and appears to be working satisfactorily, both for us and for our clients. In connection with this we have been able to direct a very considerable number of worth-while investigations to the commercial laboratories in our vicinity.

The diversity of subjects under investigation is greater than before, and involves more departments than was the case last year, some of the most important problems being carried on in the departments of Metallurgy, Biology, Chemical Engineering, Civil Engineering and Mechanical Engineering.

These problems include: an investigation of the corrosion resistance of some alloy steels; studies of the condition necessary for the preservation of food; causes of deterioration of some foods under special conditions; the development and control of refrigerating units; the relative economy of different types of fuels; the study of warp sizings for textiles; continuation of the studies of the resistance of structures to earthquakes; the flow of metals at high temperatures; the development of a number of new and interesting refractory substances, and the water absorption of masonry. At the request of the Mayor the staff of the Division is coöperating with the legal department of the City of Boston in setting up a plan of reorganization of its engineering and technical departments. As has been the case for years, numerous minor tests and investigations have been carried on for the cities of Boston and Cambridge and for the Commonwealth.

As many of the research problems involve work in several departments, a regular procedure has now been established of setting up a committee of Faculty members for the direction and supervision of each important research, the actual research workers being under their direction, and the whole project being carried out through the Division for purposes of administration.

Much of the administrative work in connection with the securing of patent protection on inventions, made by members of the staff, and the possible commercial use of such inventions is being conducted through the Division, subject to instructions from the Patent Committee.

The employment situation among Technology alumni has improved materially during the year, and the outlook for

the future is more encouraging than it has been for some time. The number of graduates placed in educational and industrial openings by the Placement Bureau during the last twelve months was greater than during the previous year, and the openings were on the average of higher quality than in recent years.

The Placement Bureau's policy of recommending only a few well-qualified candidates for each opening has been enthusiastically approved by employers and alumni, and apparently this policy is responsible in some measure for the increased number of calls from employers and more effective coöperation from the alumni.

The Placement Bureau has now definitely extended its work to cover close contacts with the graduating class, through both the department placement officers and the students themselves. This establishes initial contacts which it is hoped will persist as the seniors become seasoned alumni.

During the year many more employment managers and personnel officers came to the Institute to interview students than in any recent year. Most of these interviews were arranged by the Placement Bureau through departmental placement representatives. One tangible result of these activities and the upturn in business is that at present less than 10 per cent of the 1935 graduates are unemployed.

C. L. NORTON.

Society of Arts. The Popular Science lectures sponsored by the Society of Arts during the year were of exceptional interest. The appreciation of the public and of the preparatory schools was indicated not only by a very large attendance, exceeding on most occasions the capacity of the lecture hall, but also by letters expressing deep appreciation of the opportunity afforded to see demonstrations of some of the most recent developments in science and engineering. So great was the demand for tickets for the Sunday lecture on High Speed Motion Pictures that Professor Edgerton kindly repeated his lecture in the evening to a capacity audience and the hall could have been filled a third time by those unable to gain admittance. Dr. Van de Graaff demonstrated, for the first time before a public audience in this country, the transmutation

of one element into another. His high voltage generator also aroused great interest.

The lectures offered during 1934–35 were as follows:

December 14, 15, 16. SCIENCE AND SAILING YACHTS.
Illustrated by ship models, materials, slides, and motion pictures of the America's Cup Races.
By George Owen, S.B., Professor of Naval Architecture.

January 11, 12, 13. HIGH SPEED MOTION PICTURES.
Illustrated by experiments with the stroboscope and high speed camera, and by motion pictures of numerous phenomena recorded in less than one hundred thousandth of a second.
By Harold E. Edgerton, Sc.D., Assistant Professor of Electrical Measurements.

February 8, 9, 10. HEAT AND COLD PRODUCED AND CONTROLLED BY RADIATION.
Illustrated by numerous experiments on radiation phenomena, by solar engines and heaters and by recent ascensions into the stratosphere.
By Gordon B. Wilkes, S.B., Professor of Heat Engineering.

March 8, 9, 10. TRANSMUTATION OF ATOMS BY HIGH VOLTAGE BOMBARDMENT.
With experiments showing the generation of high voltages and illustrating the methods of disintegrating atoms and producing artificial radioactivity.
By Robert J. Van de Graaff, Ph.D., Associate Professor of Physics.

H. M. GOODWIN.
Secretary, Society of Arts.

Admissions. The Admissions Office embraces in its activities both field and office work. The fieldwork began with a tour by the Director among the universities of western Canada, after preliminary visits in Wisconsin, Minnesota, and North Dakota; and ended with visits in the states of Washington, Oregon, California, Nevada, Utah, and Colorado. The objects of this tour were: to promote good will among sister institutions; to explain to the boy of high school age the nature of technical education, its prerequisites, and the occupations to which it leads; to inform mature students of their opportunities

to pursue advanced studies; and, beyond this, as social opportunities offered, to exchange ideas with faculty groups on some of the recent developments in engineering education, drawing upon observations of educational methods made in his travels as well as his experience at the Institute. Everywhere in Canada, as well as in the United States, administrative officers of schools and colleges received the Director cordially, and joined him in the discussion of questions of mutual interest. In Canada, as in the United States, educators expressed appreciation of the moving picture film of the Institute which illustrates its facilities for study. Everywhere Honorary Secretaries of the Institute, or other members of the alumni, helped to arrange speaking programs in schools or colleges, and to make appointments with prospective students or their parents. According to a custom followed for some time, by arrangement with Professor Locke, Alumni Secretary, the Director was the luncheon or dinner guest of Technology clubs or groups of alumni at several centers along his route.

The second part of the year's fieldwork was confined to colleges and schools in New England, New York, New Jersey, and Pennsylvania. Other members of the faculty visited local schools, particularly in Massachusetts, and the Dean of Students visited several educational institutions in Alabama, Kentucky, Texas, and Louisiana at the time of the annual meeting of the Association of Deans. During the year the Director visited 43 colleges and universities, 63 secondary schools, and 12 Technology clubs or groups.

The office work consists of correspondence of nation-wide, and at times of world-wide, scope, relating to admissions or courses of study, graduate and undergraduate; interviews with prospective candidates for admission and their parents; the sending out of application blanks and literature; and, with the aid of a staff of technical examiners, the evaluation of credits presented by students entering from other institutions. The Admissions Office is the center of correspondence with our Honorary Secretaries, of whom there are now over one hundred in this country and Europe, performing various services for the Institute and becoming every year more helpful in recruiting its student body. The President's luncheon for Honorary Secretaries and officers of Technology clubs at the time of

Commencement provided an opportunity for consideration of the best methods of selecting students for the Institute and of making known its educational advantages.

During the year there has been no change in admission methods from secondary schools — Examinations by College Board, Plans A and B; the New York Regents System; the Institute examinations in the fall; and the upper fifth plan of admission without examinations, are all in force. The upper fifth form of admission is growing in importance. The entrance requirements are the same as for many years past, but the latest catalogue announces definitely that Mechanical Drawing will be accepted as an entrance elective — the result of mutually beneficial conferences between the Institute and teachers of Mechanical Drawing. The Department of Mathematics has approved the new forms of College Board Entrance Examinations in mathematics known as Alpha, Beta, and Gamma to replace some of the older forms, and by personal interview has encouraged several high-standing secondary schools to teach more advanced mathematics than is expected of students who comply with our usual entrance requirements in that branch of study.

JAMES L. TRYON.

News Service. During the year the News Service has extended its activities, particularly in the detailed form of publicity which brings to families and friends in their home towns the activities and scholastic honors of individual students of the Institute. Last June, for the first time, the News Service undertook the task of sending out individual news stories on the graduation of outstanding students. This entailed the preparation of 361 statements, with photographs of most of the graduates concerned. The undertaking was made possible through the coöperation of the Placement Bureau, which supplied detailed information on the students, as well as their photographs.

Other news of students included individual home town releases on every scholarship granted by the Institute. These included 224 on the award of graduate scholarships, 185 on competitive and regional scholarships and 140 on the regular undergraduate awards. In addition 400 individual accounts

were released for students on the Dean's List of Students of High Scholastic Standing. Statements were issued on the activities of individual students, the honors groups and the status of the Technology Loan Fund. In this field alone the News Service distributed more than 1,200 separate stories to a total of approximately 134,000 words of copy.

News of the Institute, particularly regarding science and research, continues to hold strong editorial interest nationally and internationally, despite a general curtailment of newspaper space resulting from economic conditions. Among valuable new outlets for our news were several in Canada, one in particular being a news feature syndicate which distributes to most of the large Canadian newspapers.

European publications, both newspapers and magazines, are interested in Institute news as indicated by increasingly frequent requests for special information and photographs. All publications in this country and abroad are specially eager to get the high-speed photographs of Dr. Edgerton and Mr. Germeshausen. Their coöperation in supplying excellent photographs has drawn favorable attention to the Institute and no doubt has helped in suggesting industrial applications of their method of photography.

One phase of our work which is of great value in the development of public good will and individual editorial friendliness is coöperation with various writers of special articles, editorials and books. The Institute is more and more coming to be looked upon as a source to which writers may come for information with the assurance they will receive friendly coöperation. Needless to say this very valuable work could not go on without the assistance of various members of the staff who willingly give of their time and experience. Their assistance may be looked upon as means of encouraging accurate popular writing, and a most valuable service in interpreting science and engineering to the public.

Under the agreement with the *Technology Review*, the News Service has coöperated in supplying news to the Institute Gazette Section of the magazine.

Last winter, for the third year, the News Service with the coöperation of members of the staff offered high and preparatory school students a series of six Saturday Afternoon Science

and Engineering Exhibits. Departments coöperating were Electrical, Chemical, Aeronautical, Civil, Mining, Mechanical, Naval Architecture and Marine Engineering, Biology and Public Health, Chemistry, Physics, and Geology. To these exhibits sixty-nine high and preparatory schools sent 1,186 students, many of whom came to all exhibits. During the series four applications for admission to the Institute were received. The total cost of the series was $79.09.

For several years the News Service has been making a collection of biographical material on members of the faculty and the officers of administration. Much of this material has been developed in the form of biographical sketches which are proving useful in many ways, particularly in publicity in connection with visits of the staff to other cities for lectures or professional society meetings.

Since last spring the News Service has had charge of the distribution of the films produced by the Division of Visual Education. These are the series of animated studies of the behavior of traveling electrical waves, and the graphic study of machine operations. No attempt has been made to promote the films on a large scale, for the interest aroused by news announcements of their completion has brought requests for showings in many parts of the country and several from abroad. Aside from frequent showings in other educational institutions and before professional or technical groups, the films have been in demand for lay groups. The study of machine operations has been particularly suitable for this purpose and it has been seen by thousands of men in the Citizens Conservation Corps camps of the South.

JOHN J. ROWLANDS.

SCHOOL OF ENGINEERING

Aeronautical Engineering. The curriculum has been modified by reducing the language requirement from French and German to French or German. The student is expected to acquire a reading knowledge of that language which he did not offer at entrance. It is believed that aeronautical literature is now preponderantly in English, a condition that did not obtain a few years ago.

Applications for admission to the course continue to exceed the allowed thirty but it is not recommended that the numbers be increased, in view of the large number of aeronautical engineers being turned out annually by other institutions. While the industry is growing, it has never been able to employ the annual output of the schools. On the other hand, our graduates continue to be in demand. This year practically the entire graduating class has found employment directly in the aviation industry or in allied fields dealing with aerodynamics and light construction.

Our graduates have the advantage of a basic training in mechanical engineering, but also benefit from the fact that the course was the first established in this country. As a result, practically all of the important airplane and engine manufacturing plants have Institute graduates in key positions. A similar condition obtains in the engineering side of the Army, Navy, and Department of Commerce.

The Federal Aviation Commission of five men appointed by the President, in accordance with an act of Congress, to recommend national policy as to commercial and national defence aviation included Professor Hunsaker and Non-Resident Professor Warner of this course. Professors C. F. Taylor and O. C. Koppen were called before this Commission as experts to survey their special fields.

During the year, various members of the staff coöperated with units of the industry as consultants, participated in the meetings of the professional societies and generally improved our contacts with this rapidly developing industry. At the annual meeting of the Institute of the Aeronautical Sciences, Professors Taylor, Smith, Koppen, Draper, and Markham presented papers.

Professor Ober reported his aerodynamic tests of the Burlington Zephyr train, Professor Koppen his work on airplane control near the stall, and Professor Draper his method for the determination of the dynamic characteristics of instruments.

During the year the 7½-foot wind tunnel, which has been reserved for air flow research projects, was reëquipped with a six-component balance, and generally overhauled to make it available for testing airplane models. Airplane design is changing so rapidly that only by close coöperation in the solution of

day-to-day problems can our staff keep abreast of current developments. Response of the industry to the availability of the wind tunnel has been gratifying in that models of several projected designs have been submitted for aerodynamic analysis, giving our staff first-hand knowledge of next year's designs and relieving our budget substantially.

As soon as possible, we should construct a new wind tunnel, as the present equipment is becoming inadequate accurately to predict the aerodynamic characteristics of modern fast airplanes. When the tunnel was built, 50-foot airplanes flew at 125 miles per hour. We now have 100-foot airplanes flying 250 miles per hour.

During the year, Professor Draper has conducted a research on engine and propeller vibration for the Navy Department, Professor Koppen has developed new apparatus for determining the stability characteristics of airplanes by means of model tests, and Professors Ober and Markham have conducted a wind tunnel examination of cascade interference in coöperation with the Harvard Engineering School.

It is believed that many aeronautical engineers qualify as airplane pilots but practical flight training must be obtained at a regular flying school or with the Army or Navy reserve organizations. However, our students get little or no flying experience before graduation. In order to give them a better appreciation of the control problems involved in design, each member of last year's senior class was given 1½ hours of flying at the Boston Airport. The expense for this special instruction was provided by a special vote of the Corporation. The results were highly successful, and it is recommended that the practice be continued.

Work on fundamental aspects of aviation engines was marked by the successful completion of several research problems on detonation, combustion, vibration, etc., which are reported under Mechanical Engineering. The Automotive Laboratory is used by students and staff of both courses.

Structural research during the past year was confined to problems on stressed-skin structures and the first series of bending tests on 40-inch diameter aluminum alloy cylinders was completed. Compression tests were made on a number of panels of aluminum alloy and stainless steel, some of the latter

having been furnished by the Army Air Corps. Work has been done to develop a test frame for determining allowable stresses on curved sheets in shear.

Data from aircraft structural tests made during the past five years have been compiled in a report circulated to supporting manufacturers and government agencies.

Structures courses have been modified but slightly during the past year, but students are urged to supplement structures courses by courses in Vibration and Metallurgy to obtain a broader view of the fundamental problems of design.

Special lectures were given by W. Starling Burgess on the principles of design of yachts and aircraft, by Igor Sikorsky on flying boats and by Non-Resident Professor E. P. Warner on air transportation.

J. C. HUNSAKER.

Building Engineering and Construction. The continued stagnation of the building industry which has seriously affected all branches of construction has made itself felt both in decreased enrollment and employment. The widespread unemployment in the industry together with lack of opportunity has made building construction unattractive and registration has dropped sharply. Employment of graduates has been difficult but has shown some improvement in the last year. Placement in temporary or permanent positions during the depression years is approximately as follows:

100% of the Class of 1932
90% of the Class of 1933
75% of the Class of 1934
60% of the Class of 1935

No substantial changes in the course schedule have been deemed necessary during the past year. The study of special problems of importance to the industry has been continued. Professor Tucker has developed his investigation of low cost housing and has reached the conclusion that no materials or methods of construction, in prefabrication or otherwise, have as yet been able to reduce the cost of housing below that which has heretofore prevailed. The wooden house continues to be the cheapest house that can be built. Nevertheless, it can be

shown that existing costs of building can be reduced by 30 to 40 per cent by resort to quantity building of entire communities of homes, with a standardized shop practice. This calls, however, for a revision of hitherto accepted procedure in planning, construction and financing and, while it would be of the greatest social consequence and would supply homes for many millions of people who cannot now afford to purchase a home, the economic effect upon existing property presents a serious obstacle to the adoption of the plan.

Professor Voss has carried on his work on the Permeability of Brick Masonry Walls and has succeeded in obtaining somewhat greater support for his study for the coming year than before. The work is being done under the Division of Industrial Coöperation. In June he addressed the members of the National Lime Association, assembled in convention at Hot Springs, Virginia, on "Research and the Lime Industry." The direct result was the establishment by the National Lime Association of a $1,000 Fellowship for the coming year. This has been awarded to Mr. Howard R. Staley, who will be research and laboratory assistant to Professor Voss and will do graduate work leading to a Master's degree. This work has now been carried on for four years. The program of study for the coming year involves:

"Effect of Amount and Time of Movement on Bond"

"Study of Volume Change of Brick and Mortars"

and "An X-Ray Study of Brick, Lime, Cement and 'Bond Layer' Compounds."

ROSS F. TUCKER.

Business and Engineering Administration. In addition to their normal teaching activities, the members of the Department have directed their energies primarily toward the further improvement of texts used in courses offered by the Department.

Professor Elder has published a new book on industrial marketing. Professors Porter and Fiske have published a text in accounting, as well as a class edition of problems in cost accounting. Under the chairmanship of Professor Fernstrom, a committee including Professors Elder, Fiske, Schaefer, and Professor Thresher of the Department of Economics and Social

Science will publish in October a new book on business organization and management. Professor Fiske has also collaborated with the Department of Economics and Social Science in the joint preparation of the new class edition of a text in economics. Professor Raymond has prepared a new class edition of his work on industrial theses methods. Professor Schell will publish in December a general reference book for graduate use in business administration.

The third stage in the development of the senior coördinative subject Industrial Problems was effected by a change in curriculum, making this a required subject for all seniors and graduate students. The organization of the course took the form of a comprehensive examination, extending throughout the second term. Class work was jointly conducted by seven members of the Department and one member of the Department of Economics and Social Science. Collaboration of business executives in the conduct of the course, which was undertaken experimentally, will be amplified in subsequent sessions of the subject.

The redesign of the Industrial Practice Group, permitting the extensive use of technical electives, has proved of interest to a considerable number of students. At present there are in this group students with specific interests in the fields of air conditioning, textiles, aeronautics and automotive engineering.

Continuing realization of the importance of research work in the development of imagination and initiative has prompted the increase in time allotted to theses and its extension from the second into the first term of the senior year. Other curricular changes have been generally directed to the introduction of enlarged elective privileges and further emphasis upon fundamental subjects in scientific and engineering areas.

During the fall, a joint committee composed of the junior instructors in the Departments of Business and Engineering Administration and Economics and Social Science was appointed to make an investigation of objectives, teaching method, and scholastic standards employed in the organization and presentation of business and economic subjects in the Course XV curriculum, and to report upon opportunities for improvement which the survey revealed. The committee's report, which was based upon an analytic study of past records

as well as conferences with senior members of both departments and deans of business administration at Dartmouth, Yale and Carnegie Institute of Technology, served effectively to allay any tendency toward departmental complacency. Many of the recommendations of this committee have been incorporated into future operating policy.

A pleasant event of the year was the dedication, in Ware Hall, of the Francis Wright Fabyan and John Russell Macomber Rooms. These rooms, while available for use by the graduate student body, were designed to be of specific use to the Honorary Sponsorship Group of the Department, for purposes of weekly dinner and discussion meetings with distinguished administrators. The experience of the year has more than justified the care and thought which were expended on matters of arrangement and interior decoration.

The Third European Industrial Tour, sponsored by the Thorne-Loomis Foundation, offered opportunity during the summer for twenty-six students to visit ten European countries, fifteen principal cities, and a variety of industries and points of historical and cultural interest. The group included six students from other departments of the Institute, as well as representatives of Harvard, Yale and Princeton. The itinerary included the Scandinavian countries for the first time, where Technology alumni and friends extended a most hospitable welcome. The Department is indeed indebted to the Thorne-Loomis Foundation for their continued generosity in making these opportunities for foreign travel available to our students.

The fourth and fifth Industrial Addresses were presented during the year by Edmund C. Mayo, President of the Gorham Manufacturing Company, and Harry Arthur Hopf, head of H. A. Hopf & Co., Inc. Mr. Mayo described the "Yardsticks Useful During Initial Period of Remedial Plant Management." Mr. Hopf related "Experiences in Management Engineering."

On December 31 the Department, in conjunction with the Department of Economics and Social Science, conducted the Fourth Annual Business Conference for the benefit of graduates in New England. The general topic of the conference was "Changing Attitudes of Business," the guest speaker being Henry I. Harriman, President of the Chamber of Commerce of the United States of America.

The fine spirit of coöperation shown by executives in addressing students and in leading group discussions has been a great source of gratification. The year has brought contributions of this nature from thirty-five industrial administrators, including twenty-three chairmen of boards, presidents or vice-presidents. This close personal contact with men of high administrative proficiency has been of great assistance to the Department, and is sincerely appreciated.

During the summer, the Department was represented at the Sixth International Congress for Scientific Management in London, where Professor Schell presented a paper outlining a special program of training for higher administrative positions which has been the result of departmental experiments conducted during the past few years.

The Department expresses its appreciation to the members of its Visiting and Advisory Committees for their generous coöperation and assistance.

ERWIN H. SCHELL.

Chemical Engineering. The staff has been augmented this year by the return of Professor Weber from a year's study in Switzerland, and by the appointment of the new department head. Student registration has increased, the tendency being particularly notable in the graduate group.

Efforts have been directed towards a critical analysis of the Department's activities as a basis for determining future policies. Frequent conferences of the entire staff, a comprehensive discussion with the Visiting Committee and the active coöperation of alumni in a departmental meeting on Alumni Day have contributed greatly to this program.

The senior Honors Group experiment, now in its second year, has been somewhat modified in the light of experience, and shows promise of becoming a permanent feature of the curriculum. It is felt that the nine men of this year's Honors Group profited by the opportunity thus afforded to develop a more adequate appreciation of their professional work and an added measure of initiative and resourcefulness. The undergraduate curriculum has otherwise undergone only minor modification. The Department is offering a new course in Industrial Chemistry for Mechanical Engineers.

The School of Chemical Engineering Practice has profited from increased contact with the staff at Cambridge, and the year's work has shown a gratifying improvement in calibre and scope. Professor Cooper, Director of the Bangor Station, spent the second term in instructional work at Cambridge as a part of this program for closer association of the School with the resident staff. It is our opinion that this School, unique in its policy and operation, is almost ideally adapted for graduate instruction in the application of chemical engineering, and warrants continued efforts to realize its further potentialities.

Special activities included a symposium on Distillation, under the auspices of the American Chemical Society, held at the Institute under the chairmanship of Professor Adams during the Christmas vacation, which attracted papers and an audience from all over the country. During the year a number of prominent engineers spoke before graduate students on problems, both technical and otherwise, illustrative of those commonly encountered in the practice of the profession. The success of these talks indicates that they should be continued and expanded.

This year witnessed final liquidation of the staff and activities of the Research Laboratory of Applied Chemistry, an organization which for a quarter of a century had served with remarkable success as a training school in industrial research, and had contributed much to the development of applied chemistry. Furthermore, this Laboratory had coöperated effectively with the Department in carrying part of the graduate teaching load by giving subjects in which its members specialized. Filling the gap thus created will prove difficult.

The research work of previous years on the properties of hydrocarbons has been utilized in the study of a large-scale petroleum rectifying unit handling a complex hydrocarbon mixture. Other work on rectification has involved both theoretical and experimental investigations of plate column operation at high capacities where entrainment occurs.

The general program for investigating the behavior of emulsoidal solutions led into a study of the related problems of the viscosity characteristics and the gelation of suspensions, particularly of clays. The work is being conducted in connection with a study of the flow of such suspensions in drilling

wells in an effort to develop and improve the technique of chemical control of the physical properties of the drilling fluids. By-products of the investigation are already throwing light on the behavior of clays in such important matters as decolorization by adsorption filtration. This program may well result in valuable contributions to our knowledge of such phenomena. Another feature of the general program on colloids has been studies of the setting of cement, carried out in collaboration with research in the Civil Engineering Department.

The nature and properties of natural and vulcanized rubber latex have been studied, particularly as they cast light on the mechanism of vulcanization of latex. Various derivatives of rubber, such as the chlorinated and oxygenated products, are being prepared in an effort to use rubber as a starting material in the synthesis of other high molecular weight derivatives of unique properties. The facilities of the high pressure laboratory have been utilized largely for synthesis of organic materials from gases at high pressure.

Radiation measurements have been extended to cover additional gases at high temperature, and the mechanism of combustion of solids has been clarified by delicate sampling and microanalysis of gases in the film surrounding a burning particle. Continuing work on so-called "eddy diffusion" through fluids in turbulent motion has contributed significantly to our knowledge of absorption and related phenomena.

The death of Arthur D. Little, whose advice and coöperation contributed much to the development of chemical engineering at the Institute and to the chemical industry generally, represents a real loss to the Department. Dr. Little was instrumental in spreading the Institute's teaching policies to other professional schools, and the founding of our graduate School of Chemical Engineering Practice was largely due to his efforts.

WALTER G. WHITMAN.

Civil and Sanitary Engineering. The most significant addition to the work of the Department during the year was the extension of its research activity by the development, under Professor R. W. Carlson, of a laboratory for the investi-

gation of the phenomena which occur during the hydration of cement in concrete. An extension of the concrete laboratory was donated by Dewey & Almy Chemical Company; this included rooms with temperature and humidity control. Apparatus was installed for the measurement of heat of hydration, shrinkage and permeability. The General Electric Company contributed part of this equipment. While sufficient development was carried out to afford means of studying several significant problems, it is proposed to increase the laboratory space and to procure apparatus which will make it possible to extend this research program. The problems under investigation during the year were: the shrinkage of concrete, and its basic causes; effect on shrinkage of (1) kind and size of aggregate, (2) composition and fineness of cement, (3) admixtures of various types, and (4) protective coatings. Through coöperation with other departments a logical, though not complete picture of the mechanics of hydration was obtained; the nature and importance of silica gel was disclosed. Professor Carlson published during the year several papers based on the work done in this laboratory. He will be on leave of absence at the University of California during the coming year.

Mr. Ruge has extended his preliminary study of the effect of earthquakes on elevated water tank structures and of quake-resistant tank tower design. Most of the year has been spent in designing and constructing a new shaking table which is intended to produce any arbitrary horizontal motions with an accuracy suitable for quantitative model study. The Associated Factory Mutual Fire Insurance Companies has shared some of the cost of the new shaking table, and the remainder was provided from the Whitney Fund. The Chicago Bridge & Iron Works and the Pittsburgh-Des Moines Steel Company have recently appropriated funds for extending research on water tank design for seismic regions to be carried on as soon as the new shaking table has been completed.

Professor Camp has continued his experimental studies of water filtration at the water purification plant of the City of Providence. Additional studies, leading to the development of a basis for estimating the removal of suspended solids from water and sewage by settling, were made with a view particularly to the development of practical methods of measuring

suspended particles in water and sewage which is being clarified. The report on plumbing research, dealing with the hydraulics of water closet bowls and flushing devices, which has been in progress for the past few years, is complete and arrangements have been made with the Massachusetts State Association of Master Plumbers, who coöperated in this undertaking, for its publication.

The River Hydraulic Laboratory has undertaken a model study of the Cape Cod Canal for, and in coöperation with, the United States Corps of Engineers. Models of two portions of the canal have been constructed in one of the Institute buildings and model studies have been carried on during the year under the general direction of Professor Reynolds. The purpose of the study is to determine data for design in widening and deepening the canal, to investigate tidal effects and their control and the mean low water profile of the proposed canal.

The principal projects undertaken in the field of Soil Mechanics, under Dr. Gilboy, were: a study of the deformations of sand under three-dimensional stresses; model tests on seepage through a dam on a pervious foundation; model tests on seepage into isolated wells; development of original methods for design of embankments on yielding foundations; study of a mechanical analogy to the classical earth-pressure problem; study of stress distribution under footings by actual measurements and by photoelasticity. Improved devices have been developed for consolidation tests, for friction tests, and for measuring the seepage characteristics of pervious foundations.

Dr. Wilbur has completed the development of a method of successive elimination of unknowns in the analytical solution of indeterminate structures by the slope deflection method. A substantial gift by Sir Douglas Alexander for the construction of a simultaneous equation machine has been partially expended under the direction of Dr. Wilbur, who has been supervising the construction of this apparatus which is about half completed. The solution of as many as nine simultaneous equations may be made with this calculating machine.

A complete survey and readjustment of the rowing courses on the Charles River Basin were made by Professor Babcock for the Technology and Harvard Athletic Associations. This

was made necessary by the changes in the shore line on the Boston side of the Basin.

Professor Spofford returned, after a year's leave of absence, and reassumed the direction of the structural division. He offered a new graduate course, "Professional Practice in Civil Engineering."

Professor Breed has served on an advisory committee to Mayor Mansfield of Boston on coördination and reorganization of the public works activities of the city. He has also served the State Department of Public Works as consultant in charge of a comprehensive investigation of the causes of defects which have appeared in the new concrete highway from Boston to Worcester.

For the first time in thirty years the Department has suffered the loss, through death, of any of its staff. On January 10, Professor George L. Hosmer died; his death was followed, on February 26, by that of Professor Emeritus Dwight Porter, and on May 11 by that of Professor Emeritus Alfred E. Burton. The Department recognizes that Professor Hosmer's death has left a gap which will be hard to fill, and it senses the contribution of Professors Porter and Burton to its early development.

CHARLES B. BREED.

Electrical Engineering. The academic year 1934–35 has been my last year of duty before retirement at the age of seventy years from the post of Head of the Department of Electrical Engineering, and it has seemed desirable to give complete attention to consolidating the work already in hand and to leave to my successor the problems of further improvements for the Department's philosophy and practice in research and education. My report for the previous year presents the important new things on hand that year. These have been effectually continued, and improved in feature, during the academic year just ended.

The annual meeting of the Visiting Committee on this Department was occupied with a summing up of the accomplishments of the Department during its 53 years of existence, and particularly during the last 28 years, in which great growth

of influence has occurred. In the same 28 years there have been conferred three-quarters of the Bachelor's degrees (now numbering 2,590), substantially all of the Master's degrees (now numbering 759), and all of the Doctor's degrees (now numbering 28) that have been awarded by this Department.

The advantages of utilizing carefully organized research as an instrument of undergraduate and graduate education in electrical engineering in addition to its service as a means for adding to knowledge, the desirability of treating each student admitted to the upper classes (juniors and seniors, as well as graduate students) in electrical engineering as an individual of spirit and ambition rather than as part of a group of seekers after conventional instruction, the serviceability of comprehensive examinations covering the full ground of each student's studies and arranged so as to arouse resourceful initiative in the examinees, and the importance of educational breadth to be derived from appropriate coöperation with industry, have all been proved beyond dispute by our experience. Each of the first three of these methods has often been declared by teachers of influence to be impracticable in engineering education and the fourth condemned in educational circles as inappropriate and undesirable because of being too realistic. Our demonstration establishes both the practicability and desirability of all four, when suitably planned and carried out. The notable influence in the electrical engineering field which is exerted by the Department is a tribute to the success of these methods and to the admirable qualities of our Department staff.

My successor, Professor Moreland, will find that the Department successfully cultivates most of the important aspects of electrical engineering, but improvements are yet to be introduced into the cultivation and there are still some aspects of the field which we ought to occupy but which limitations of time, space, and money have thus far prevented. Therefore there is ample scope in the situation to demand the utmost of his capability and resourceful creativeness. I feel sure that he will find his new post an absorbingly interesting one.

The most promising innovation in engineering education now under consideration is the proposal for establishing concrete intimacy and coöperation between the Electrical Engineering Department and the Department of Economics and

Social Science, which has been favorably viewed by the Visiting Committee on this Department. Professor Moreland's experience in engineering life peculiarly adapts him to further this project. I also commend to his attention certain improvements in the procedure and the scope of our laboratory educational practices, as well as the revision of our undergraduate text material. The equivalence in maturity, and in preparation for substantial study, of our sophomore, junior, and senior students with the students pursuing their first, second, and third years in most of the European universities must not be overlooked.

The staff of the Department is notably able, fertile, and industrious. It is made up of relatively young men, and its aggregate intellectual strength is unexcelled by any university faculty group associated with electrical engineering in any location with which I am familiar. This gives promise for the Department of continued leadership in its field, and I feel sure that my successor will find the staff loyal in support of all efforts for the welfare of the Department and the Institute. The intellectual quality of the staff is testified to by the grade and number of written contributions to physics, engineering, and educational publications of merit which annually come from its members.

The commencement of 1935 was the fiftieth anniversary of granting degrees in electrical engineering by the Institute. Since the Institute established the first formal four-year curriculum in electrical engineering extant, and the influence of the graduates has been remarkably large, this anniversary possessed sufficient significance for the Alumni Association to join with the Department in a fitting celebration. At a morning symposium the speakers (all electrical engineering members of the Alumni Association) were: Dr. F. B. Jewett, on behalf of industry; Dean A. A. Potter, on behalf of engineering education; and Dr. Vannevar Bush, on behalf of the Institute. A luncheon, with the retiring head of the Department and his appointed successor as guests, was held at noon, again with speakers who are representative of the Institute and the status of the Electrical Engineering Department. An expository exhibit representative of the activities of the Department was open during the day.

Since last year's report was written, certain activities which had then been planned, but were not yet in progress, have been initiated. There has been constructed an apparatus for artificial cathode disintegration by positive ions. The first problem to be undertaken with the apparatus is making accurate measurements of rates of cathode sputtering and of threshold conditions relating to sputtering. We have gone into this because of our need for the information in prosecuting other work, and collaterally because of its possible bearing on the theory of electric arcs.

This is an illustration of the route by means of which considerable of our notable work has arisen. The work on dissipation of fogs over a limited area, for which funds are contributed by the Bureau of Aeronautics of the United States Navy, the Army Air Corps, and the Bureau of Air Commerce in the Department of Commerce, arose as a consequence of research relating to the penetration through fog of light from an electric lamp source; the stroboscopic photography arose as a consequence of research on certain operating conditions of electric motors in our Machine Transients Laboratory; and so on. Progress has been made during the year on the various features of research referred to in last year's report, which I will not now enumerate, although some of it is of highly promising character.

The improved text material was used successfully with sophomores during the second term, and the material intended for the juniors in the first term of the next academic year is under way. Certain improvements of curriculum have been made. Two additional graduate subjects have been approved and will be offered in the form of lectures and laboratory work during the next academic year, i.e., "Mathematical Analysis by Mechanical and Electrical Methods" and "Super-High-Voltage Engineering and Vacuum Electrostatic Machinery." The Coöperative Course (VI-A) seems to be coming back to normal conditions. A coöperative course in mechanical engineering (II-A) has been arranged between the General Electric Company and the Institute's Department of Mechanical Engineering and went into operation this summer. It is the agreement that general supervision of this course shall be in the hands of Professor Timbie, of the Electrical Engineering

Department, since it is important to exhibit unity of purpose, and Professor Timbie's experience with Course VI-A makes him the advisable choice. It is also provided that he shall be assisted by a delegated member of the Mechanical Engineering Department staff in addition to a delegated member of the Electrical Engineering Department staff who is continued as heretofore.

We are indebted to the following companies for coöperation in our colloquia: Brooklyn Edison Company, Century Electric Company, Delco Products Division of General Motors Company, Electric Storage Battery Company, General Electric Company, Westinghouse Electric and Manufacturing Company, and Bell Telephone System. Facilities and funds in support of research have been contributed directly by Colonel E. H. R. Green, General Radio Company, Research Corporation, Mr. Alfred Loomis, and also by others indirectly. Our research project on the oxidation stability and electrical characteristics of electrical insulating oils has been enlarged at the request of the Edison Research Coördinating Council, which has also provided the funds to make this enlargement practicable. Several serviceable gifts of equipment have been received from various donors to the aggregate value of some thousands of dollars.

Members of the staff have exhibited their usual activity in the committees of professional electrical engineering and other scientific societies. An unusual committee service has been that of Professor Hudson in membership of the committee appointed by the Governor of the Commonwealth to review and advise regarding public utility rates in Massachusetts. Fifty articles and one book have come from the pens of members of the staff during the year.

The annual exchange of an assistant professor in return for a corresponding professor from another institution was inaugurated last year. For the year 1935–36, our Assistant Professor Richard H. Frazier goes to the Electrical Engineering Department of the University of Kansas, and Professor Robert W. Warner of that department comes to us. This exchange, carried on under the conditions which have been established, has already proved a desirable influence in electrical engineering education, and it has promise of further distinguished

results. Applications are already in hand for exchange during the year 1936–37. Our Department is large enough to make an exchange from among our competent assistant professors or younger associate professors every year. Electrical engineering departments are smaller in other institutions, and cannot support an annual exchange. Therefore we shall successively exchange with different institutions, which will be to our advantage and we hope will prove generally of advantage to electrical engineering education.

An additional step was taken during the year. Following our customary plan, two professors from other institutions were employed to teach in the electrical engineering work of the summer school. This has proved desirable over a period of years. This year the institutions from which we secured the members of the summer school staff — Purdue University and Kansas State College — each employed one of our instructors for service in its summer school. This plan cannot be made the equivalent of the established exchange of professors under Institute approval for full academic years, but the summer school arrangement carried on with less formality can serve usefully for enlarging the experience of our promising instructors.

As this is my final report as Head of the Department of Electrical Engineering, I express to you my wishes for your continued and long-time successful career as President of this great institution of learning.

DUGALD C. JACKSON.

Mechanical Engineering. The revision of undergraduate courses, described in principle in last year's report, has been continued as opportunity permitted. The plan to allow concentration in one major field of mechanical engineering in the senior year seems to have resulted in students finding positions in industry more readily, although a general improvement in demand must also be noted. However, inquiries from industry usually specify a student who has proved his ability in a particular field. For example, the demand for automotive engineers this year has far exceeded the supply.

An important innovation was the inauguration of a Coöperative Course (II-A) with the General Electric Company.

The first class of nine was selected from a group of sophomores of marked aptitude, who will, for the next two years, alternate between the Institute and the Company's works, with a final or fifth year of graduate study here. On graduation, the student will be under no obligation as to his future employment, but he should be trained for the technical and executive responsibilities of any large manufacturing operation. Students at the works are paid at regular rates, the total of which approximates the tuition charges for the three years of the Coöperative Course. It is expected to select a group each year from students who have clear records for the first two years.

The development of the shops into metal working laboratories has proceeded during the year with the aid of a special grant of $15,000 by the Corporation. In addition, about $5,000 worth of modern welding and cutting equipment has been donated by the industry.

Pattern making has been discontinued in order to make space for welding. The Welding Laboratory is now well equipped to give instruction in all of the fundamental processes of welding and flame cutting, and the ground work for future expansion has been laid. Both elementary and advanced courses are now offered in this field and research on some important aspects of spot welding and the metallurgical disturbance of flame cutting is under way.

In the Foundry the addition of new melting and control equipment, together with the installation of a modern Sand Control Laboratory, has made it possible to adjust the instruction to approach modern industrial foundry practice.

The installation of a large power forging hammer, automatically controlled preheating furnaces, drop-forging dies and an experimental rolling mill has been the first step toward the transposition of the old forge shop to a Metals Working Laboratory in which it will be possible to give instruction and conduct research in the fundamentals of all hot and cold metal working processes.

Results of research on fatigue of welds and on flame cutting of structural steel were reported by Professor Zimmerman to the appropriate professional societies.

A generous donor has provided funds for the equipment of the new laboratory for Professor de Forest's work on the

dynamic strength of metals. Fatigue machines, equipment for the study of crack growth, and for magnetization have been installed. The Spang-Chalfont Company has donated a large machine for testing the fatigue properties of full size shafts such as are used in machinery.

Since the Photo-Elasticity Laboratory was taken over by Mr. R. W. Vose in September 1934, attention has been devoted to the improvement of its equipment, and to the advancement of the photo-elastic technique. The interferometer strain gage, developed in the laboratory, has been successfully applied in the analysis of several problems and the results incorporated in a paper published by the A. S. M. E. Applied Mechanics Division. A New England Conference on Photo-Elasticity was inaugurated this year. The first meeting was held at the Institute in June, with representatives from Brown University, Harvard University, Rhode Island State College, Tufts College, and Worcester Polytechnic Institute.

Research on the important subject of surface fatigue (or wear) of materials has been assisted by a grant from the Engineering Foundation. Tests of surface fatigue under rolling contact show that the repeated stresses tend to advance the outside lamina of the material, and if the load is above the endurance limit, this outside lamina flakes off eventually.

During the year Professor G. B. Haven has brought to completion three pieces of laboratory apparatus, which promise to become of practical value to the textile industry, for the following purposes, viz.: *Crimp Measurement* of the sinuosity of yarns as they rest in fabric, *Corkscrew Measurement* of the difference in straightened lengths of components of plied yarns, and *Resilience Measurement* of the compressibility of fibers used for paddings and upholstery.

Development work in the field of Textile Miscroscopy continued with applications of polarized light and similar techniques to problems of textile technology. The year has marked the introduction in a number of mills of the methods for determining the maturity of cotton fiber as worked out by polarized light technique in this laboratory. This is a major and positive contribution to the textile industry of the country. A project extending throughout the year was undertaken under the sponsorship of the Barber Colman Company for the elec-

trical and optical measurement of the character of cotton, a property of cotton not hitherto quantitatively evaluated. The master set of fiber longitudinal and cross sectional mounts which is unique in this country is well under way and should be complete in another year. In May the United States Institute for Textile Research inaugurated a coöperative research program with the Textile Foundation at Technology, and the work is being centralized through the Textile Laboratory.

The research projects included a theoretical and experimental investigation of induction system dynamics which appears to have paved the way for theoretical solutions of problems in this field. Further development of the "M. I. T. knockmeter" brought it to a point where it is ready for field trials. These will be conducted in the autumn of 1935. The apparatus for photographing flame motion in a working cylinder has been perfected and is now ready for a rather extensive research program. An investigation of factors controlling the rate of pressure rise in a compression-ignition cylinder added some new data to existing information on this subject. The photographic method of following air flow in engine cylinders, developed during the previous year, was applied to a two-cycle scavenging problem with success.

Research carried out in coöperation with government and industrial agencies included development of an electric torsiograph and an apparatus for measuring airplane propeller deflection. In preliminary field trials this apparatus has given promise of being a very important tool for investigations in the field of crankshaft and propeller vibration. A special Diesel combustion chamber and a new form of two-cycle engine have been given exhaustive tests in coöperation with private concerns. The usual number of minor investigations, including fuel rating and accessory tests, have been made. All of the members of the automotive engine staff have been called in consultation by important companies during the course of the year.

Professors Keyes and Keenan are preparing new steam tables of improved precision extending to 5,000 pounds and 1,600°F., based upon experimental work at Technology and elsewhere.

A graduate course in Engineering Thermodynamics has

been added to furnish a scientific basis for the broader application of thermodynamics in engineering. Apparatus has been developed for measuring the discharge coefficients of metering nozzles with steam under a variety of flow conditions.

In Professor Wilkes' Heat Measurements Laboratory, experiments in low temperature radiation have been added to the courses in Heat Measurements, due to the commercial development of reflective type insulation. Research has been started on the thermal conductivity of gases and low temperature radiation between parallel plates. An extensive investigation of the cost of heating water with various fuels and appliances was completed during the year for the American Gas Association in conjunction with the Division of Industrial Coöperation. The coöperative work with the A. S. T. M. Committee C-8, on the best means of determining the thermal conductivity of refractories and insulating brick at high temperatures, is nearly complete.

Professors Fuller and Hunsaker and four junior members of the staff visited the University of Michigan's Summer School of Applied Mechanics. Inspections were also made of the technical educational courses given employees at several of the larger industrial plants. It is evident that modern industry prefers to teach its own practices, but demands of the Institute graduate a sound knowledge of fundamental processes, a technique of investigation, and facility in applied mechanics, thermodynamics and written expression.

For the research and development departments of industry, graduate study is of advantage. For the manufacturing departments, our graduates with the Bachelor's degree need a better appreciation of materials and their transformation. The development of our shops into metal-working laboratories should help meet this condition. There is no requirement that our graduates be expert machinists or mechanics.

Mr. D. R. Pye, Deputy Director of Scientific Research of the British Air Ministry, visited the Department and lectured on British developments in the internal combustion engine field. Dr. Sillcox of the New York Air Brake Company gave two lectures on railway equipment. Professor den Hartog of Harvard demonstrated many interesting types of mechanical vibration. The Department received helpful advice and

encouragement from the frequent visits of Mr. Franklin A. Park, Chairman of the Visiting Committee of the Corporation.

J. C. HUNSAKER.

Meteorology. During the year advanced studies in Meteorology were pursued by seven civilian students and two Army officers. Two degrees in Meteorology were awarded, one Sc.D. and one S.M. Among our graduate students was Father E. Vazquez, S.J., from the Jesuit Observatory at Havana, who plans to continue his studies for a second year. Another of our graduate students spent most of the year at the Geophysical Institute in Bergen, observing the present "Air Mass Analysis" technique of the Norwegian meteorologists, and studying, under the supervision of Professor J. Bjerknes, certain Weather Bureau sounding balloon observations extending into the stratosphere.

Coöperation with the Blue Hill Observatory has continued with the holding of joint seminars every Monday evening, and the planning of a joint program of radio meteorograph development. Through the courtesy of Dr. C. F. Brooks, Director of the Blue Hill Observatory, Dr. B. Haurwitz collaborated with Professor Rossby in a series of lectures summarizing our present observational and theoretical knowledge of the interaction of the troposphere and the stratosphere.

Coöperation with the Woods Hole Oceanographic Institution continues to be very useful. The investigations of Professor Rossby, assisted by Mr. R. B. Montgomery, of the characteristics of the homogeneous boundary layers in the atmosphere and in the ocean, have been completed, and a full report has been published. Mr. R. Seiwell of the Oceanographic Institution has worked at Massachusetts Institute of Technology in association with Professor Rossby and has published two reports during the year on the results of observations made by the research vessel *Atlantis*. Mr. C. Iselin of the Woods Hole Institution gave a series of twenty lectures at the Institute, summarizing our present knowledge of the waters of the Atlantic.

Dr. Willett's general study of cross sections through selected synoptic situations, based on the airplane data from

our station at East Boston and from the Weather Bureau, was completed and a report on the investigations has been published. The synoptic work of the meteorological group will now be concentrated upon the extension of the cross section method to include the upper troposphere and the lower stratosphere. To this end Dr. Willett is continuing the synoptic study of the stratospheric soundings which were inaugurated last year with a special grant from the Rockefeller Foundation. Two more series of balloons were released from St. Louis during this year. Further releases are planned for the South during the coming year in the hope of investigating disturbances of tropical origin.

There was completed and published a report on certain features of the instrumental work, both meteorological and navigational, carried out by Dr. Lange and Professor Draper in connection with our airplane meteorological station. Also published was a report on a special investigation by Mr. A. Spilhaus of the physical properties of human hair which bear on its use for the humidity element of the standard meteorograph. For the fourth consecutive summer the Institute maintained a meteorological field station during the National Soaring Contest in Elmira, New York.

The War Department has continued to coöperate in our aerological work at East Boston Airport. All of the ascents this past year were made with the Army planes and Lieutenants A. Merewether and J. K. Lacy were detailed to the Institute for meteorological training and flight duty. During the coming year the Weather Bureau will also coöperate in the maintenance of this station by accepting it as one of their network, and stationing an observer there to aid in the evaluation of the observations. The flights will continue to be made in Army planes by Army pilots. The work will be under our supervision, giving an opportunity to carry on special research and to train students in observational technique.

Coöperation with the Weather Bureau is being extended in other directions. Three of our graduate students have entered the service of the Weather Bureau during the year to aid in the introduction of the Air Mass Analysis methods in forecast work. Two Weather Bureau men have been granted special scholarships to pursue graduate studies in meteorology

at the Institute, and to carry out particular investigations in their field.

The prospect of employment of promising graduate students in meteorology by the Weather Bureau continues good. Also the demand by the air lines for well trained and capable synoptic meteorologists remains unsatisfied.

C. G. A. ROSSBY.

Mining and Metallurgy. This Department, under which Course XIV, Electrochemical Engineering, is administered, includes also five divisions of the Graduate School offering degrees of S.M. and Sc.D. in: (1) Mining Engineering; (2) Petroleum Engineering; (3) Metallurgy; (4) Electrochemical Engineering; and (5) Ceramics.

The course in Electrochemical Engineering, just completing its first year under the administration of the Department of Mining and Metallurgy, has a history of thirty-five years and nearly three hundred graduates, many with records of high achievement in electrochemical and electrometallurgical industries, in metallurgical plants, in research laboratories, as members of staff in universities and technical schools and as members of law firms engaged in the practice of patent law.

The curriculum of the course has this year been improved to an important degree, we believe, by the introduction of considerable amounts of time for elective subjects in the third and fourth years. The purpose in view is to enable the students to select a field of major interest such as electrical engineering, metallurgy or applied chemistry, leading either to graduate study or the employment he seeks. Gateways to opportunity in new applications of electrochemistry, such as applied organic chemistry or ceramics or some as yet untried, may open to the student through happy choice of electives.

Recognition within the past year has been accorded two important fields of instruction by authorization on the part of the Administration of the degrees of Master and Doctor of Science with specification in Ceramics and in Petroleum Engineering. The instruction in Ceramics has been under development at the Institute for several years by Professor

F. H. Norton, whose training in science qualifies him to stress fundamentals so essential in this field. The degree of Doctor of Science in Ceramics, the first in the history of the Institute, was awarded this year to Professor E. O. Wilson, on leave of absence from Yenching University, Peiping, China.

It is pertinent to note here that the Department sets up no formal undergraduate curriculum in Ceramics; but undergraduate ceramic subjects are offered and are available as electives by way of preparation for graduate study in Ceramics for students enrolled in appropriate courses in science or engineering. There was prepared and sent out to a long list of schools and industrial ceramic plants in this country a bulletin describing our work in Ceramics. The bulletin was cordially received, and is bringing new students to the Institute and gifts from several companies of raw ceramic materials which we otherwise must have purchased.

With regard to Petroleum Engineering, preparation for graduate study may be had in an undergraduate curriculum in Petroleum Production. The field of instruction in graduate study has been expanded so as to include subjects pertinent to the production of petroleum given in the Departments of Geology, Economics and Chemical Engineering, and counting for credits for Master of Science in Petroleum Engineering.

The teaching of the subject of mining methods has recently been employed in this Department as a vehicle for training the undergraduate student in self-expression by means of the spoken word applied to problems in his chosen profession; to put it simply, the student makes the preparation and does the talking, while the teacher listens, questions and guides. The same principle has been successfully applied in weekly thesis conferences held jointly by students and staff members of all divisions of the Department. Wholesome rivalry develops in these groups, with resulting and splendid improvement in the ability of the student to tell well what he has to say about something in which he has a vital interest.

Another development in teaching deals with the treatment of economic fundamentals in relation to the practice of mining and the production and marketing of the various mineral products and metals. Considerable research dealing with

economic problems in mining has been done in recent years by graduate students in Mining Engineering.

The Department coöperates with the U. S. Army in connection with the training of twenty-five student officers at the Watertown Arsenal. Professor Williams and Professor John T. Norton have for several years given instruction in advanced subjects in physical metallurgy and physics of metals. This year the time allotment is much increased and elementary subjects dealing with production and physical metallurgy will be included in the program.

Professors Williams and Homerberg have completed revision and enlargement of their textbook, "Principles of Metallography." Professor Bitter is writing a textbook of ferro-magnetism, and is preparing laboratory equipment to develop studies of metals by magnetic means.

Opportunity for employment on the part of our graduates has been restricted to a degree during the depression; mining engineering has been affected most and many men have had to take what they could get; production metallurgy has been affected less, with marked recovery this year; physical metallurgy has been affected least inasmuch as all our graduates have found prompt employment even though at measurably reduced salaries. There has been insistent inquiry from the ceramic and petroleum producing industries for adequately trained men, a circumstance encouraging the expectation of wholesome growth of these branches of instruction.

Recent research done in the field of mining engineering includes a significant laboratory investigation by means of a specially designed furnace to develop data relating to means of extinguishing or controlling fires in coal mines. Researches, dealing with the economics of mineral fuels, begun three years ago, are being continued.

The laboratories of fire metallurgy have been busy with the development of new data relative to the behavior of various non-ferrous ore minerals under chlorinating and sulphating conditions. Professor Hayward has developed a counter-current system for lead softening with recovery of antimony and regeneration of the fluxing agents. Research has been continued by Professor Waterhouse on special steels for railway rails with most excellent results.

The Division of Physical Metallurgy continued its activity in both fundamental and engineering fields. Professor J. T. Norton is making X-ray studies of solid solutions and age-hardening alloys, wherein much progress has been made in the development of a simple and rapid procedure which yields accurate results. Professor Zavarine has continued an investigation of the phase changes in steel produced by rapid quenching. In the first instance, the changes were studied by means of magnetic measurements, while in the second the changes were followed by means of the X-ray. The results, believed to be of great theoretical importance, may lead to modifications of commercial methods of heat treatment of steel. Professor Homerberg is continuing work on nitrided steels and is especially concerned at present with special cast and malleable irons susceptible of surface hardening with ammonia.

Professor Williams is associated with the Division of Industrial Coöperation in an extended investigation of the fundamental causes of the pitting type of corrosion of stainless steels of the 18 per cent chromium-8 per cent nickel type, an investigation expected to lead to results of importance to the manufacturer and user of stainless steel and stainless iron.

Under the direction of Professor F. H. Norton, the laboratories of ceramics have carried out significant research. One project of equal interest to students of geology, and sponsored by a grant from the Penrose Fund of the Geological Society of America, deals with kaolinization of feldspar; so far it has been possible to break down feldspar into sericite and quartz in a reaction chamber with water and carbon dioxide. Another project relates to the flow of porcelain at elevated temperatures. It now appears that the flow is of a plastic nature, comparable with the flow of metals, and not viscous as has been usually supposed. Studies of the plasticity of clays results in the development of a device whereby plasticity is quantitatively measured. Continuing researches, in which considerable progress is reported, relate to the further development of insulating firebrick and to the production of bricks of low thermal conductivity.

This report would not be complete without some account of the contacts with industry and professional societies had by the various members of our staff. Professor F. H. Norton

spent eight weeks studying ceramic schools and industrial plants in England, Sweden, Denmark and France. Professor Hutchinson, during the year-end holidays, inspected old gold mines in Virginia, mines seen by William Barton Rogers in 1835, and described in his "Geology of Virginia." During the April recess, the Porcupine Gold Area, Ontario, was visited and contact renewed with the managers and engineers of the prolific gold mines thereabouts. The newly discovered Anahuac Oilfield, in the Texas Gulf Coast area, sixty-five miles east of Houston, was examined, new friends made and new interests discovered.

It is desired to accord recognition here to the work done by Professor Locke, who besides his many duties in the Department, still finds time to carry on the duties of Alumni Secretary, Class of '96 Secretary, and as Personnel Officer representing the Department. In the last relation, it is no more than fair to say that he has been the creator of the rôle of "Personnel Officer"; for thirty years he has taken the initiative in assuming the task of finding employment for every new graduate in mining and metallurgy and we believe he has, during this long period, placed more than half our graduates in their first jobs. It has been his aim to write, at least twice a year, to every graduate of the Department a newsy letter, preserving at once the interest of the Institute and the loyalty of the graduate.

W. SPENCER HUTCHINSON.

Naval Architecture and Marine Engineering. During the spring Professor Jack visited the Model Basin at Langley Field, regarding the design of which the Institute was consulted before work was commenced. While this Basin is designed purely for testing seaplanes, considerable ingenuity has been displayed, and when the Institute's own tank is undertaken the superintendent of the Langley Field Basin should be consulted. Professor Jack visited the shipyard of John Brown of Clyde Bank during the summer and inspected the construction of the giant liner *Queen Mary*. He also visited the yard of Messrs. Denny Brothers at Dumbarton, and at both yards was given every facility to note the improvements that were being made in ship construction.

Professor Chapman wrote two articles on shipping for the *Marine Review* and has been engaged on a textbook, "The Ship in Port." He and Professor Rossell have been appointed joint editors of a new book on Naval Architecture which is to be published within the next year. Professor Chapman visited a number of the ship owners who have graduates of the Department in their employ, to discuss with employers the suitability of the Department curriculum.

There have been few changes in the work of the Department, the principal one being the deletion of the Machine Tool work formerly required of the naval students.

Professor Keith has been in close contact with the Fore River shipyard on technical matters. This association is very useful both to the shipyard and to our course as it keeps us in constant touch with most recent developments.

Professor Burtner has visited the principal shipyards where our graduates are employed, the personal contact being of great help in enabling us to place our students upon graduation.

The Museum has been enriched by a set of further sketches by the late William Bradford, these being the gift of Mr. Charles H. Taylor. We have also received a Log Line and Cole Protractor, together with a colored print of the Coast Guard cutter *Bear* from Professor Russell.

J. R. JACK.

SCHOOL OF SCIENCE

Biology and Public Health. It has been the policy of the Department for the past ten years to have its entire staff share in discussion of proposed changes in courses. The most noteworthy change in undergraduate instruction during the year has resulted from such group consideration. The introductory course in General Biology, which is the student's first serious approach to biological thought and processes has been reorganized. This traditional course has been so modified by transposal and extension of subject matter that under Professor Bunker's direction it has greatly stimulated the spirit of inquiry in the students and has already developed a rational understanding and appreciation of the significance of the

specialized subdivisions and applications of biological science which compose the professional curriculum of the upper years.

The Department has long followed the practice of placing the introductory and general courses under the direction of experienced and skilful teachers, and this has been especially the case in courses like general biology and general bacteriology which introduce new concepts of life and relation to environment to the student.

The continued development of the course in air examination by Professor Jennison is also worthy of comment here. Introduction of new laboratory procedures and the correlation of physical, chemical and biological aspects of the subject has made the course of special value to our students in Public Health Engineering. It is gratifying to note that graduate students in the Department of Mechanical Engineering who are specializing in ventilation and air conditioning problems constitute a major portion of the class. The developments in this course should be of great service in the work of the Committee on Air Conditioning which was established last year, and conversely the work of that Committee should find its didactic outlet through this and allied engineering courses.

Professors Horwood and Proctor have coöperated with the Military Science Department by aiding in the instruction on military and personal hygiene and sanitation.

The increase in numbers of students in some of the courses has necessitated the taking over of the Research Laboratory on the mezzanine floor as a teaching laboratory in Industrial Biology, and the rearrangement of space to adjust to this condition.

The graduate instruction continues to expand in scope and usefulness. The work in advanced biochemistry has been highly successful and during the next year will be coördinated with new graduate courses in organic chemistry given in the Department of Chemistry, each being independent yet supplementary to the other. This is an excellent example of the spirit of coöperation in teaching and research.

Doctors Dunn and Gould have made especially valuable contributions to the instruction in advanced industrial microbiology, as well as in undergraduate subjects.

The new graduate courses in serology and in food technology mentioned last year have more than justified their

introduction. Establishment of further courses should be undertaken only after careful thought or increase in personnel, as every member of the staff of and above the rank of instructor is at present participating in both graduate and undergraduate instruction and in research.

It seems fitting to mention the fine spirit of coöperation existing between departments. Biology acknowledges with gratitude its indebtedness to Physics, Chemistry, Electrical Engineering and Meteorology for assistance in carrying out its research programs. This is especially the case in research in biochemistry and in the study of microbiology of the air at high altitudes. Research work in the Department is varied and often limited by cramped quarters, but by most economical use of space the needs have been generally met. During the past summer a small but excellently planned and equipped research laboratory has been made from a portion of the former animal room, and in another graduate research room there has been installed, with the coöperation and help of Dr. Stockbarger, the equipment for most precise methods for study of radiations.

At the Spectroscopy Conference held at the Institute in July, Doctors Bunker and Harris reported their findings, as the culmination of a five-year investigation, that the lines from a mercury arc between 2,537 and 3,025 Angstroms inclusive comprise the therapeutically active zone of light in the cure of experimental rickets, and thus established definitely the answer to a problem about which medical men have speculated for the past fifteen years. This solution to a perplexing question, of practical importance from a health standpoint, could not have been obtained with precision without the large quartz monochromator, constructed for this particular research last year with the aid of funds from the Rockefeller Foundation grant.

A research grant by the Upjohn Company has enabled Dr. Dunn to carry out an extended research on the germicidal value of certain new types of organic compounds. The results of this work will soon be published. A similar grant has been offered for the coming year for the continuation of Dr. Dunn's work.

It is gratifying to record also that after three years as holder of a junior Textile Fellowship, Dr. Prindle has been

awarded a Senior Fellowship for the continuation of his work on the Microbiology of Fibres.

The appointment of Dr. Irwin W. Sizer brings a new reinforcement to the research program for the next year, as well as a teacher who has gained a high reputation elsewhere. Dr. Sizer's researches on chemical stimulation, as well as his technical work in connection with the efforts of the New Jersey Oyster Commission to prevent the destructive inroads of enemy organisms, have won high praise.

Professor Turner has been granted leave of absence for the year 1935–36, and has already begun his highly significant activities by investigations of the health education programs in Russia and in Poland, and by presiding over the International Congress on Health Education at Oxford. He is to lecture and hold consultations with educational authorities in Paris, at the League of Nations at Geneva, and later with former students in Ceylon, China and Japan, now in charge of the health education programs of their respective countries. His Institute work will be cared for by the appointments as special lecturers of Dr. Charles F. Wilinsky, Deputy Commissioner of Health of Boston, who will direct the work in public health administration; Mr. Charles F. Horan, specialist in industrial health and insurance and who has a brilliant record in this field, in charge of industrial hygiene, and Dr. Percy G. Stiles, trained at Massachusetts Institute of Technology and Johns Hopkins and for many years a Professor of Physiology at Harvard Medical School in personal hygiene and nutrition.

Professor Prescott is a member of a commission recently appointed by the Governor of the Commonwealth to study the public health laws and practices of the state and make recommendations for future legislation. He is also at present the chairman of the Section on Food and Nutrition of the American Public Health Association, and has been asked to accept associate editorship of a new journal in this field.

Professor Blake has been elected a Trustee of the Boston Society of Natural History, and also President of the Boston Malacological Club.

S. C. PRESCOTT.

Chemistry. Rapid changes during the last few years in the number of students taking first-year Chemistry have created several difficult problems. An average for the two terms of 610 students in 1929–30 reached a maximum of 653 in 1930–31, with a minimum of 442 in 1933–34 and 499 in 1934–35. One of the most trying of these problems has been the adjustments of teaching personnel, a problem intensified through the death of Professor Joseph W. Phelan, one of our most experienced and skilled teachers and an able organizer of freshman instruction. Professors Tenney L. Davis and Louis J. Gillespie, normally active in the work of the later and graduate years, gave unstintingly of their time, thereby assisting Professor Blanchard, in charge of first-year instruction, to meet a situation which could easily have been disconcerting, except for versatility of instructing staff.

The Department has been convinced for many years that a great improvement in instruction and *esprit de corps* would be realized if the number of students admitted to first-year chemistry, and consequently the staff assigned to this work, were stabilized. The experience of the last five years emphasizes the need of some such plan, for otherwise it becomes almost impossible to define and carry through a consistent program of improved instruction. The quality and organization of the first-year instructional work is in many respects of more importance to our students than the work of later years. It is gratifying to note that a Faculty Committee has been appointed to consider all phases of stabilization.

The systematic discussion of items related to the efficient performance of our undergraduate duties, of the broader aspects of teaching and administrative procedures, and of ways and means of realizing objectives attainable only through sustained coöperative effort over a long period of time suggested the advantages of a permanent undergraduate chairman appointed by the administration. On recommendation, Professor Leicester F. Hamilton was appointed Administrative Officer in charge of undergraduate instruction, coöperating with the Department chairman. The arrangement has the further advantage of giving the Department chairman more freedom to assist in the development of the graduate work of

the Department, which has expanded since the inauguration of the Eastman Laboratories.

The necessity for the rearrangement of time schedules caused some postponement of a plan for improving the laboratory instruction in physical chemistry for chemical engineering and chemistry students. The development of laboratory facilities and improvement of the laboratory work is recognized and has been planned to meet the rapid advances in the subject during the past few years. Further amplification of the work and the introduction of new courses is contemplated.

The subject of comprehensive examinations was not referred to in the preceding year's report but a considerable amount of time and thought has been expended throughout the year in an attempt to make the work of more value to the students. The underlying hope in this effort has been mainly that the student's sense of the organic relations of the various branches of science would be cultivated and his scholarship deepened. Unfortunately such an attempt encounters the unconscious but very real opposition arising from the detached or compartmentized character of students' education prior to entering the Institute. It is a related and characteristic species of intellectual immaturity which makes it difficult to operate a so-called "honors" group. However, definite progress has been made and the effort is worth continuing, at least until experience, the safest guide in educational matters, leads to devices which will assist in leading the student instinctively to correlate his knowledge and to intellectual independence. The outstanding result of last year's experience with the comprehensive examination was the indication of the value of suggested methods of study and correlation in preparation for the examination.

The system of progressive electives adopted for Course V students this year was apparently satisfactory. Students contemplating graduate study selected a substantial and nourishing intellectual diet of mathematics, physics and chemistry. Students interested more particularly in industrial practice have had opportunity to specialize in technical courses.

The scientific productivity of the Department staff and our graduate students has remained substantially on the level of last year. It has been of great interest to note, however, the

year-by-year improvement in the intellectual quality of students applying for admission to graduate study. There are several reasons for this, chief of which is the extraordinary stimulus to sound scientific work brought about by the granting of National Research Fellowships during the past fifteen years. The high quality of the students applying is tangible evidence of the rapid rise in level of scientific talent and thought in American universities where the younger generation are now coming in contact with former National Research Fellows. Unfortunately the fraction of these superior students who ultimately register for graduate work is disappointingly small. The fact finds explanation along the lines mentioned in many earlier reports — insufficient scholarship aid for outstanding students in the form of grants for expenses over and above tuition. To do more than formulate the problem is difficult during a period of economic and political confusion. The Department has discussed the general problem with the Visiting Committee and tentative plans have been developed to deal with the situation.

The Department suffered an irreparable and grievous loss in the death of Professor Samuel P. Mulliken (Class of 1887) on October 24, 1934. Professor Mulliken was internationally known for his painstaking and monumental work on the identification of organic compounds. Since the death of Professor F. J. Moore, he directed the undergraduate instructional work in organic chemistry in a spirit reflecting the rare qualities of mind and heart which always endeared him to his friends and colleagues. His presence will be keenly missed by those who were privileged to be associated with him.

The year brought another bereavement in the death of Dr. Arthur D. Little (Class of 1885) on August 1, 1935. Dr. Little loved the Massachusetts Institute of Technology and was one of its most capable and distinguished sons. A life member of the Corporation, his was a familiar figure at any gathering connected with the Institute. As Chairman of the Visiting Committee of the Chemistry Department, he was in constant contact with all its problems. Few possessed his amazing vitality, his vivid and fertile imagination, his freshness of feeling, his merry disposition and sense of humor. The contributions he made to the development of the Chemistry

Department were many and important. The erection of the Eastman Laboratories came about largely through his sustained effort. Dr. Little's attention during the last few years was centered on the improvement of facilities for graduate study. His memory will ever be honored in the Department which he honored by his selfless devotion and abounding affection.

FREDERICK G. KEYES.

General Science and General Engineering. Registration in Course IX has increased steadily during the past three years, the total increase during that period being 73 per cent. An extended use is being made of the flexible curricula of both options by students transferring from other colleges.

Among the new developments the greatest interest is shown in illuminating engineering and packaging engineering. Close attention is being given to the personal characteristics and aptitude of each student in all conferences relating to the selection and composition of a special schedule.

R. G. HUDSON.

Geology. A considerable revision of Course XII has been made, approved by the Faculty, and will go into effect at the beginning of the first term, 1935. The course as revised offers four options: (1) General Geology and Stratigraphy, (2) Physical and Economic Geology, (3) Mineralogy, and (4) Geophysics. The course is now designed not only to meet the requirements of students seeking a broad general preparation, but also to serve those intending to follow one of the several lines of specialization in the field of geology. All of these options have a desirable amount of flexibility by way of elective subjects, enabling the individual student to secure particular phases of work best suited to his requirements. The increased use of geophysical prospecting methods in the mineral industries has resulted in continued demand for men technically trained in both geology and geophysics. Hitherto the Geology Department has not had available a sufficient number of candidates trained for the positions offered. It is expected that option (4) in geophysics will be a first step toward the better

utilization of the excellent opportunities which the Institute affords for professional training in this new field.

The excellent collection of economic ores and minerals and other geological material is now displayed in new all-glass cases in the Department corridor, making this material more available and incidentally freeing the space previously occupied for class room use and laboratory purposes.

Aided by the Rockefeller Fund and grants from other sources, the research work of the Department has gone forward with satisfactory results.

Professor Lindgren has continued the editing of the Annotated Bibliography of Economic Geology, issued semi-annually under the auspices of the National Research Council. Seven volumes have now appeared, to which Professor Newhouse and Dr. Whitehead have made substantial contributions.

Professor Buerger has contributed two papers to the special Ideal and Real Crystal number of the *Zeitschrift für Kristallographie,* one on lineage structure and one on secondary structure in crystals. A Weissenberg type instrument, specially designed for the new equi-inclination beam technique developed in his laboratory, has been constructed and results have been obtained with it on the crystals of the realgar group and valentinite, to be published in the near future. In this same field the Weissenberg equi-inclination technique has been further developed to its probable ultimate refinement by the application of plane groups. A report of this is in press. The program of research in polymorphism initiated some time ago is being continued under Professor Buerger's direction. The chemical aspects are being handled by Mr. Mortimer Bloom, Research Associate, with encouraging results on the polymorphism of Sb_2O_3 and of HgS.

Professor Morris completed and delivered for publication a study of Central Asia in Cretaceous time. He finished and illustrated a small book, now in press, on the geological history of the Hudson River. An essay analyzing the influence of the new time-scale upon the theories of geology is being published by the *American Scholar.* Petrographic and structural studies of slates and schists in eastern Massachusetts were continued. Similar studies of the local volcanic rocks progressed with the assistance of graduate students.

Professor Newhouse has completed a comprehensive study of the manner of occurrence and relations of the opaque oxide and sulphide minerals in common igneous rocks. The results are of much significance in the general field of relations between igneous rocks and mineral deposits. Laboratory work on the gold, antimony and tungsten mineralization of Nova Scotia has been completed for publication. Professor Newhouse is Chairman of the National Research Council Committee on Processes of Ore Deposition.

Professor Shimer revised several courses he is teaching and wrote two chapters for the revision of Sedgwick and Tyler's "Short History of Science."

Under the direction of Professor Slichter three types of studies relative to the earth's crust have been completed by Research Fellows or graduate students in geophysics: (1) The layered structure of the crust, as revealed by internal reflection of earthquake waves, (2) Propagation of Rayleigh waves in a non-homogeneous crust, and (3) The viscous yielding of the crust under prolonged ice loading. Relative to the deep interior of the earth, the first quantitative study of thermal convection at depth has been completed. Except for the study on viscous yielding, the above researches are due to the two General Education Board Fellows in Geophysics in attendance at the Institute during the past year, Dr. C. L. Pekeris and Dr. Joseph A. Sharpe. Work on the development and construction of twelve portable seismometers of high sensitivity for the study of crustal structure by means of quarry explosions has been in progress under the joint support of the Geological Society of America, of Mr. Godfrey L. Cabot and of the Massachusetts Institute of Technology.

WARREN J. MEAD.

Mathematics. This was the first year in which the entire undergraduate program of Course XVIII was in effect. This program includes the fundamental work in mathematics, physics, and mechanics. Several of the mathematics subjects have heretofore been considered as of decidedly graduate character, and there was some question as to whether these could be properly handled by undergraduates. This is answered by

the fact that most of the students not only made good records but at the same time took a considerable amount of advanced work. Upon graduation they thus appear unusually well prepared for graduate work either in mathematics or in other subjects dependent on mathematics.

The graduate activity in the Department is shown by the award in June of three master's degrees in Mathematics and five doctorates.

Under the leadership of Professor Hopf the seminar was restricted to a single topic — partial differential equations, the biweekly talks constituting a general summary of that subject.

Among the distinguished mathematicians giving special lectures at the Institute during the year were Professors G. Szegö, Hans Rademacher, and Kornel Lanczos.

Professor Woods, who retired in June, 1934, continued through the year as Honorary Lecturer. To him and to Professor Bailey, who retires this year, the Department is deeply indebted for their long years of service and for their development of our present courses in Analytic Geometry and Calculus. Professor Woods has also developed numerous graduate courses, including advanced calculus, which has become the mathematical subject most frequently taken by advanced students in other departments.

Professor Struik spent the year writing and lecturing in Mexico, Holland, and Russia, and Professor J. Douglas was engaged in research at the Institute for Advanced Study, Princeton. Professor Franklin has accepted an invitation to spend next year at the Institute for Advanced Study, and Professor Wiener will serve as Research Professor at the National Tsing Hua University, Peiping, China. Professor Szasz will spend the first term lecturing at various colleges and universities under the auspices of the Institute of International Education.

H. B. PHILLIPS.

NOTE: In connection with the award of the Bocher prize jointly to Professor Norbert Wiener and Professor Marston Moore of Harvard, mentioned in last year's report, this is only the fourth award of this prize which is in recognition of a notable research memoir in analysis by a member of the American Mathematical Society published during the preceeding five years in some journal on the editorial board of which the Society is represented.

Physics. The improvements in undergraduate teaching, mentioned in last year's report, have been successfully carried out during the year. Numerous changes in freshman mechanics have improved the correlation between the subject and the introductory work in Mechanical Engineering. An interesting example of interdepartmental coöperation has been the action of the Mechanical Engineering Department in delegating a number of staff members to visit the freshman physics classes, thereby leading to better understanding of the mutual problems of the departments. In sophomore Electricity and Optics a significant change has been to group the students of Courses VI, VIII, and XIV in a separate section, taught by Professor Wulff, handling the electrical theory in a somewhat more advanced way than is possible with students of other courses, and closely correlating with the introductory work in Principles of Electrical Engineering, 6.00, which is now taken by students of these courses. In this way the students who particularly need it will receive a very thorough training in electricity in the sophomore year. The most cordial coöperation with the Electrical Engineering Department has been received in this move.

The undergraduate work in Course VIII has been improved by the further development of the Junior Laboratory, under Professor Stockbarger, and by the shift of theoretical physics to the senior year, resulting in a better balanced course of study. In the graduate work, a great deal of thought has been devoted to the question of applied physics. It was felt that the present preliminary Doctor's examinations required more knowledge of advanced theoretical and atomic physics than was reasonable to expect of a man specializing in applied physics, and it was consequently decided in the future to offer an alternative preliminary examination in applied physics, of equal difficulty with the examination in pure physics, but dealing more with those parts of physics and related subjects which are important in the applications of physics. This examination will be first offered in the year 1935–36.

The current year has been one of steady progress in research. Professor Harrison has completed the construction of his automatic wavelength measuring device, a machine which greatly improves both speed and accuracy in the process of

measuring spectroscopic plates. During the summer, with the aid of a grant from the federal government, an ambitious program was begun for remeasuring the spectra of the chemical elements. Photographs will be taken on the gratings of the Institute, measured on the new machine, and the result should be a revised table of wavelengths, both more accurate and more extensive than those now available. Professor Nottingham is obtaining valuable results on thermionic emission with small external fields, his new apparatus permitting a new order of accuracy in such measurements. Professor Warren continues his investigations both of amorphous solids and of crystals. Professors Morse and Allis have made theoretical investigations of the energy distribution of electrons in the arc, obtaining interesting and unexpected results. The writer has continued theoretical study of the electronic structure of metals. Professor Vallarta, collaborating with Abbé Lemaitre, the distinguished astronomer, a graduate of the Department, has carried further his theoretical studies of cosmic rays. The theory of the variation of cosmic ray intensity both with latitude and longitude has been worked out, partly with the aid of the differential analyzer, and the good agreement with experiment has given a convincing proof of the corpuscular nature of at least part of these rays. A coöperative program of cosmic ray research has been initiated, involving members of the Physics and Electrical Engineering Departments at the Institute, and of the Physics Department of Harvard University. Research in radioactivity, with particular emphasis on its geological applications, has been started by Professor Evans, newly arrived in the Department.

A third spectroscopy conference, with a large and enthusiastic attendance, was held in July 1935. The Department's work in applied as well as pure spectroscopy is rapidly becoming well known.

JOHN C. SLATER.

SCHOOL OF ARCHITECTURE

Architecture. The modification of our teaching policy in the early years of Design, which was referred to in last year's report, has produced excellent results in assuring a better

understanding of those basic principles that underlie all design, whether or not architectural, and that, therefore, provide a broader foundation for the students' later work. It was apparent that an experienced teacher was needed to develop the full possibility of this procedure, and the School has been fortunate in securing the services of Mr. James Ford Clapp to coöperate in this and other phases of our Design work with Professor Gardner.

For the past ten, or more, years the School has believed it desirable that the entering student should be brought in contact with the professional aspects of Architecture as soon as possible; hence history, theory, and design are all to be found in the first-year curriculum. A further step in the same direction has been undertaken for the coming year, after receiving the approval of our Visiting and Advisory Committees, namely, the designing of a small house for actual construction. The site is to be chosen and then surveyed, and the best plans submitted by the students selected for execution. Specifications and working drawings are to be prepared and contracts let, all under the direction of the instructor in charge of Architectural Practice. Then the students will supervise the entire process of construction and thus acquire a realization of practical needs that will be of inestimable value in their later studies. The house so designed and constructed is to be sold and the proceeds used in a similar manner for the next year.

The more complete coördination of the teaching of the major subjects in our curriculum is being carried out to the benefit of both staff and student. Monthly staff meetings aid effectively to this end and talks by the head of the Department to each of the classes of the first three years, at least once a term, give them a better understanding of the purpose and relation of the many courses that necessarily characterize these preparatory years.

In December a combined meeting of our Visiting and Advisory Committees was held to consider whether industrial design should, in any way, be included in the work of the School. A thorough discussion resulted in the agreement that this subject should not be treated in our undergraduate courses, as its principles are already covered in the teaching of design

and that its practical application to such fields as textiles, automobiles, etc., might best be reserved for graduate work.

At this meeting also, emphasis was placed upon the need for a much broader use of electives in connection with the regular curriculum in the senior and graduate years. A careful study of the many existing courses at the Institute that would be useful from this standpoint has been made, and the resources of our later years adapted and broadened accordingly, with a view to thus meeting more effectively the individual needs of competent advanced students.

The School is indebted to Mrs. Henry Forbes Bigelow for the gift of her husband's valuable architectural library of five hundred volumes. Mr. Bigelow took an active and useful interest in the School throughout his life. Mr. Franklin A. Park also presented several architectural books to our library.

Our students were successful in winning the Rotch Travelling Scholarship, as well as that of the Societé des Amis de l'Université. No attempt was made to send a student to Fontainebleau.

The annual graduation dinner of the School was made the occasion for an expression of the affection in which Boyd Goodwin was held by the members of the staff and the student body who had learned to know and value his devoted services for the past forty years.

Again the School gladly acknowledges the many ways in which its interests are being constantly aided by the administrative officers and teachers in Cambridge.

WILLIAM EMERSON.

City Planning. During 1934–35 a number of well-known experts in the field of City Planning and housing gave lectures and design criticisms in the course, including: Russell V. Black, Walter Blucher, Marjorie S. Cautley, Gilmore D. Clarke, Jay Downer, Robert D. Kohn, Albert Mayer, John Nolen, Clarence S. Stein, Sir Raymond Unwin, Robert Whitten, and Joseph T. Woodruff.

Three students received the degree of Bachelor of Architecture in City Planning in June, 1935; another completed the

requirements during the past summer; and the fifth member of the senior class left at the end of the first term to join the staff of the National Resources Committee (New England Region). Two graduates of the City Planning course have since joined the staff of this committee, together with several graduates of the architectural course, and another graduate is employed with the Traffic Bureau of the Massachusetts Department of Public Works.

During the second term, the Executive Committee of the Institute approved the granting of the degree of Master in City Planning. Courses in City Planning Design, Research, and Administration were approved by the faculty.

Mr. Joseph T. Woodruff, consultant to the National Resources Committee for New England, has been appointed lecturer in City Planning for 1935–36, and will give a full day each week during the session for lectures and design criticism.

Mr. Lawrence E. Hovik, winner of the Graduate Research Scholarship in 1934, followed his graduate year at the Institute by a two months' visit to England, where he continued his research under the direction of Dr. Thomas Adams, research adviser to the course.

The prospects for the coming year are good. Five students have applied for admission to the graduate year in City Planning, and four or five students should be eligible for their undergraduate degrees in June, 1936.

FREDERICK J. ADAMS.

Architectural Engineering. During the past year the course in Architectural Engineering has been registered by the State Education Department at Albany, New York as an approved course in engineering, which means that graduates from the course may qualify under the New York statute for a license to practice engineering. This is in direct line with the objective of the course as offered at the Massachusetts Institute of Technology.

Most of the courses in Architectural Engineering offered by the other schools, however, qualify their graduates for practice in architecture and not in engineering. It is unfor-

tunate that the term architectural engineer is not more definite in its meaning.

The Massachusetts Institute of Technology was one of the two schools in this country first to use the term. To us then, as now, it signified a course in engineering designed to meet the engineering problems arising in connection with architectural structures. These problems were varied and complex and have increased in their variety and complexity with the passing of time. The course was offered in an attempt to meet a demand for young men thoroughly trained in the principles of engineering, but having enough contact with architects and architectural studies to understand and sympathize with architectural ideals.

In May, 1921 the Association of Collegiate Schools of Architecture adopted the following definition of a course in Architectural Engineering: "Essentially an engineering course giving fundamental and comprehensive training in Engineering and including sufficient preparation in Architecture to put the student in full sympathy with the ideals of the architect, but with no attempt to give him facility in architectural design." As far as we are aware, this is the only definition of Architectural Engineering that has ever been officially adopted by an organization representing practically all of the recognized architectural schools of the country.

We have endeavored to keep our course in line with this definition and feel that we have good and logical reasons for so doing.

We have assumed that under normal conditions the ideal modern architectural firm comprises three elements, each being a distinct profession in itself and requiring special training, yet all working in close contact and sympathy as an organic unit. First there must be the creative element, usually supplied by the member of the firm who has majored in creative design and who by right of inheritance is still known as the architect. Second there must be the engineering element, which should be supplied by a specially trained engineer whom we have called the architectural engineer, and lastly there must be the administrative element, which may be supplied by a third member of the firm or which, under certain conditions, might be taken over either by the architect or the engineer.

Two courses now offered by our Architectural School, known respectively as "Architecture" and "Architectural Engineering," supply the training for the first two elements. A third course, to be known as "Architectural Administration," has been under consideration, and, if it should at some future time be offered, will attempt to supply the training for the third element.

It seems to us unfortunate that so few of the other architectural schools in the country have adhered closely to these distinctions expressed in the statement adopted in 1921 by their representative organization. An eagerness to make it possible for all their graduates to register as architects has made it necessary for them to include so much architectural design in their courses in Architectural Engineering that the time left for serious engineering training has inevitably been seriously reduced.

As a consequence the graduates from other schools often find themselves weak in engineering subjects, compared with our requirements, and generally have to take a substantial amount of undergraduate work before registering for the graduate year.

We believe, however, that our interpretation of Architectural Engineering is the logical one. Our use of the term was prior to all other schools save one, and we offer this statement in justification of the continuance of the policy on which our course was founded.

W. H. LAWRENCE.

Drawing. The policy which has recently been developed was continued during last year with but minor changes in detail.

The moving picture film showing the various machine tool processes, which was designed and completed during the year, promises to be of great use in helping the students visualize the meaning of the different conventions used in engineering drawing.

W. H. LAWRENCE.

DIVISION OF HUMANITIES

Economics and Social Science. The Department has continued to broaden its work in the field of social science as indicated in last year's report. Sociology under the subject title "The Social Framework of the Machine Age" has been introduced both as a General Study and as an offering of the Department of Economics and Social Science. Professor Schaefer's new course entitled "American Government," the lack of which had been deplored by the Visiting Committee of the Department, is another notable addition to our curriculum.

Twelve men were registered in the new Five Year Course and on the basis of our experience with these students some changes in methods of instruction are being made next year. It is not yet possible to forecast the development of this venture. Because it involves an extra year and because Course XV takes most of those who are especially interested in the economic aspects of engineering, the number entering the Five Year Course is not likely to increase rapidly.

Several new subjects have been added at the request of other departments. In addition to the "Social and Economic Factors in City Planning" introduced last year, Professor Burdell is offering "Methods of Social Investigation" and "Planning and Housing Legislation" to the City Planning students. In response to a request of the Department of Aeronautical Engineering we are also introducing next term the "Economics of Transportation"; this will be available for seniors and graduates of all departments.

In connection with our general elementary course in Economics, we have thoroughly revised the textbook and made some significant additions. The series of extended book reviews being contributed to *Mechanical Engineering* by members of the Department has aroused much favorable comment. Various members of our staff have continued their occasional public addresses and have been contributing their services to civic organizations as well as to the state and federal governments.

RALPH E. FREEMAN.

English and History. One of the ways in which the Department aims to broaden the outlook of Institute students

is to develop their comprehension of science as a human art. The option entitled Scientific Writing and Thought, which is elected by a considerable number of freshmen, introduces the student to scientific method and scientific literature through a study of the mind of the scientist as he attacks his problems and presents them in written form. The option in Intellectual History, offered in the second year, includes a study of the great scientific advances of the last few hundred years and their effect on civilization. General Study courses on the History of Science and the History of Engineering develop these advances in detail, while another General Study, Biography in Science, required of seniors in the course in Electrical Engineering, deals with the subject from the point of view of the individual scientist. In all these courses the student has opportunity, through speaking or writing or both, to increase his power of handling scientific ideas. By a new approach he is taught to realize the importance of accurate expression, in the use of words and the framing of sentences, and of comprehending and presenting an idea in such a way as to show that it is the outcome of a reasoned process of thought. Most important of all, by relating science to the fields of thought called humanistic, by integrating the lore of nature and the lore of man, he lays the foundation for a structure of values that is essential to the man who would live adequately in the modern world.

HENRY G. PEARSON.

Military Science and Tactics. During the year the Department continued its study of the departmental curricula with a view to preparing the students better for the break between student status and that of a commissioned officer in the organized reserves of the United States Army. The Chemical Warfare unit revised its schedules and extended its scope by adding a two-hour course in the first term of the senior year. The Air Corps unit, not having enrolled any new students during the past three years, graduated its last students with the Class of 1935 and has been discontinued. No other changes in the units took place during the year.

As a result of its recent studies, the Department has adopted one two-hour drill period for the freshmen in place of

two one-hour periods. It is expected that this will result in an increased amount of time actually available for practical instruction and that the period will not prove to be too long for the character of the instruction given. The Ordnance unit has revised its schedules and extended its scope by preparing a one-hour course to be added in each term of the senior year, effective with the opening of the school year 1935–36. No other changes are in prospect for the immediate future, although it is felt that the program for the sophomore year is not yet altogether satisfactory.

Despite cramped quarters and limited facilities, the Varsity, R. O. T. C., and Freshman Rifle Teams had an unusually successful year, winning practically all matches in which they participated. With improved facilities, they could undoubtedly continue their recent successes, and it is recommended that the expansion of the rifle range from a 5-point to a 20-point range be made a project of high priority.

S. C. VESTAL.

Modern Languages. During the year there have been no major changes in the policies and conduct of the Department. Owing to the reduced size of the staff and a decrease in the number of sections in the earlier courses in French and German it was unusually difficult to meet the schedule demands of all students, but by offering supplementary hours of instruction to small groups this difficulty was overcome. Italian was again offered for the first time in several years, and was of great practical help to at least one of our graduate students who made a professional visit to Italy this summer.

The phonograph room has been of great help to those students who wished to supplement the classroom teaching by private practice and it will be the policy of the Department to have ultimately full course records for all of the most important foreign languages, as well as a good selection of records from famous writers. As in the past, we have been able to offer our students free tickets to a number of French moving pictures shown by the Cambridge French Talking Films Association; also to secure for them at reduced rates tickets to the foreign language films shown at the Fine Arts Theater.

Through the Department a number of scholarships were offered to our students for study at German universities during the summer. One student was awarded a most attractive French scholarship giving him free transportation to France and back, with all expenses in France covered for two weeks.

Professor Langley spent most of the summer in research in Paris, and Mr. Koch devoted the whole summer to travel and study in France, Germany and Russia.

The Department is very grateful to the members of the Visiting Committee, and especially to the chairman, Mr. W. Cameron Forbes, for the interest they have shown in the successful working of the Department and for the helpful advice they have given.

E. F. LANGLEY.

The Treasurer

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 29, 1935, 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:

Coleman duPont Estate, for Endowment (additional)	$24,319.39
Contributions to Educational Endowment Fund (additional)	90.00
Henry C. Frick Estate, for Endowment (additional)	567.75
James H. Haste Estate, for Relief (additional)	1,678.06
James W. Henry Estate, for Endowment	8,226.08
C. Lillian Moore Estate, for Grimmons Fund (additional)	2,264.06
Harriette A. Nevins Estate, for Blackburn Fund (additional)	291.45
Emerette O. Patch Estate, for Endowment	7,500.00
Redfield Proctor, for Vermont Scholarship (additional)	10,000.00
Julia A. Read Estate, for Thomas A. Read Scholarship Fund	21,117.00
William P. Ryan Memorial Scholarship Fund, Contributions	3,557.42
Elizabeth R. Stevens Estate, for Boyden Fund (additional)	113.80
Mr. and Mrs. Thomas, for W. B. S. Thomas Fund	928.58
Estate of William Lyman Underwood, for Endowment (additional)	6,380.00
Estate of Everett Westcott, for Endowment	122,794.00
Estate of Elizabeth B. Willman, for Scholarship	5,065.51
Edwin A. Wyeth, for Endowment	269,665.64
Balance of Fund held in Trust by M. I. T. since 1913 and distributed to six beneficiary institutions in 1935	
	$484,558.74

Miscellaneous Gifts:

Sir Douglas Alexander, for Research	$10,000.00
American Philosophical Society, for Salary and Research	2,450.00
American Telephone & Telegraph Co., for Course VI-A	3,750.00
Anonymous, for Research and Fellowship	8,370.00
Babcock & Wilcox Co., for Industrial Fund	1,500.00
Godfrey L. Cabot, for Geology Department	4,846.50
Godfrey L. Cabot, for Research Associates of M. I. T.	1,000.00
Dewey & Almy Chemical Co., for Research	1,100.00
William Emerson, for City Planning	1,666.67
General Electric Co., for Course VI-A	3,750.00
Contributions for German Scholar (Rockefeller Foundation)	1,650.00
W. P. Gray, for Class of 1893 Fund	25.00

National Academy of Science, for Research	$2,000.00
American Academy of Arts and Science, for Research	1,350.00
Geological Society of America, for Research	3,000.00
L. J. and Mary E. Horowitz, for Course in Building Construction	9,000.00
Alfred L. Loomis, for Research	1,000.00
J. F. McElwain, for Research Associates of M. I. T.	1,000.00
Emma B. Moore, for Current Expenses	100.00
Redfield Proctor, for Travelling Fellowships	3,000.00
Contributions to Professor's Fund	328.50
Theodore Robinson, for Research Associates of M. I. T.	1,000.00
Rockefeller Foundation, for Research	31,749.96
Alfred P. Sloan, Jr., for Graduate Scholarship	2,000.00
Smithsonian Fund, for Physics Department	500.00
	$96,136.63
Total Capital and Miscellaneous Gifts	$580,695.37

The Edmund Dana Barbour Field House was completed before the opening of the Institute year in September, 1934 and has been a most welcome addition to our recreational and athletic facilities. The total expense, $55,000, was borne by the Edmund Dana Barbour Fund. A considerable amount of building alteration incidental to the reallocation of space to departments was also carried out during the summer of 1934.

Income from students decreased $48,000, which was in line with the reduced registration but the return from investments showed a marked increase, $61,000, and additional income amounting to $35,000 from other sources, including appropriations from certain special funds, made it possible for the Institute to balance its budget for the year — a budget which called for expenditures approximately $48,000 greater than the previous year. All of this budget increase was for academic purposes.

The balance as a result of operations for the year was $238.73. The Institute's cumulative deficit on account of operations since 1865 now stands at $24,951.22; a reduction from the previous year of $4,927.42 due to credits received from operations prior to July 1, 1934.

The Book Value of the Endowment Funds, $31,767,649 shows a decrease of approximately $81,000 over the previous year despite gifts and additions of $484,558. This difference is accounted for by investment changes reducing the total of the Endowment Reserve Fund to $133,934.14.

No Endowment Fund on the books of the Institute has at any time been reduced in principal by reason of investment changes or otherwise than by appropriations for specific Institute purposes made in accordance with the terms of the various gifts or bequests.

As might be expected, the investment list shows a great number of changes during the year and the stock holdings in the General or

pooled investments now exceed 37 per cent. The Market Value of all securities held on June 29th was 102.5 per cent of their Book Value. Corresponding figures were 93 per cent a year ago; 82 per cent two years ago and 66 per cent three years ago. All Book Values represent the purchase price or, in the case of securities received through gifts or bequests, the Market Value as of the day received — both subject to the customary premium amortizement.

Total cash received as income from all investments and allocated to the funds gave a yield of 4.65 per cent. This compares with 4.53 per cent a year ago; 4.47 per cent in 1933 and 4.54 per cent in 1932.

August 15, 1935.

Executive Committee
Massachusetts Institute of Technology
Cambridge, Massachusetts

Report of Technology Loan Fund Committee

Dear Sirs:

I desire to submit the enclosed report of the Technology Loan Fund Committee for the fiscal year ended June 30th, 1935 which includes a cumulative statement of receipts and disbursements for the five fiscal years ended June 30th, 1931, 1932, 1933, 1934 and 1935, together with statement showing how the balance of the Fund is now constituted.

I also enclose report of Messrs. Loomis, Suffern & Fernald (Certified Public Accountants) covering their examination of the accounts of the Technology Loan Fund.

The names of the members of the Technology Loan Fund Committee are as follows:

Charles Hayden, *Chairman*
Gerard Swope
Edwin S. Webster
Pierre S. du Pont
John E. Aldred
Karl T. Compton
Horace S. Ford

Respectfully submitted,

CHARLES HAYDEN,
Chairman Technology Loan Fund Committee.

TECHNOLOGY LOAN FUND
STATEMENT OF RECEIPTS AND DISBURSEMENTS

	Fiscal Year Ended June 30, 1931	*Fiscal Year Ended June 30, 1932*	*Fiscal Year Ended June 30, 1933*	*Fiscal Year Ended June 30, 1934*	*Fiscal Year Ended June 30, 1935*	*Total*
Subscriptions received from Contributors in Cash	$654,792.25	$25,000.00	$357,634.18	.....	$36,500.00	$1,073,926.43
Subscriptions received from Contributors in Securities in lieu of cash — value when received	73,093.75	11,000.00	3,700.00	.....	.....	87,793.75
TOTAL SUBSCRIPTIONS	$727,886.00	$36,000.00	$361,334.18	.....	$36,500.00	$1,161,720.18
Income on Securities and Interest on cash on hand	17,966.01	18,202.66	25,423.65	33,133.29	21,025.53	115,751.14
Profit on Securities sold	.....	.....	.....	13,939.75	8,934.35	22,874.10
TOTAL RECEIPTS	$745,852.01	$54,202.66	$386,757.83	$47,073.04	$66,459.88	$1,300,345.42
†Remitted to Institute for Loans to Students	53,848.00	173,484.01	189,695.92	169,190.05	89,482.30	675,700.28
BALANCE OF FUND	$692,004.01	*$119,281.35	$197,061.91	*$122,117.01	*$23,022.42	$624,645.14

* Deficit for year. † See Schedule P.

STATUS OF FUND AT JUNE 30, 1935

Securities received from Contributors in lieu of Cash and included herein at the Value when Received

195	Consol. Gas Elec. Lt. & Power Co. of Baltimore	$25,000.00
*65 98/600	Electric Bond & Share Co.	10,000.00
250	Intl. Power Securities Co. $6 Pfd.	6,000.00
*390	North American Co. com.	22,078.26
250	Stone & Webster Co.	24,718.75
		$87,797.01

Securities Purchased		*Cost*
$27,000	Atl. Gulf & W. I. S/S 5s 1959	$14,580.00
50,000	Balt. & Ohio R.R. conv. 4½s 1960	50,625.00
100,000	Bklyn. Man. Trans. 6s 1949 A	99,000.00
75,000	Chgo. No. Western Rwy. conv. 4¾s 1949	74,625.00
75,000	Chgo. R. I. & Pac. Rwy. conv. 4½s 1960	74,812.50
50,000	Intl. Cement Corp. 5s 1948	39,250.00
		$352,892.50
	TOTAL INVESTMENTS	$440,689.51
	Cash on Hand	$183,955.63
	TOTAL FUND	$624,645.14

* Includes subsequent stock dividends.

To the Corporation of the
Massachusetts Institute of Technology:
Report of the Trustees of the
Massachusetts Institute of Technology Pension Fund

Dear Sirs:

A financial statement of the Trustees of the Massachusetts Institute of Technology Pension Fund follows herewith:

BALANCE SHEET, JUNE 30, 1935

Assets

Investments (as listed below)	$898,433.62
Cash	29,760.73
Total	$928,194.35

Liabilities

Teachers' Annuity Fund (5% salary deduction, plus interest)	$493,091.81
*M. I. T. Pension Fund (3% appropriation, plus interest)	339,493.02
Reserve Fund (and interest)	17,487.82
Special Reserves for Annuity Payments (18 Annuitants)	78,121.70
Total	$928,194.35

Par	*Investments* (as above)			*Book Value*
$10,000	Dominion of Canada	4½%	1936	$9,825.00
50,000	United States of America	3%	1948	50,560.00
30,000	Atlantic Refining Co.	5%	1937	30,415.00
10,000	Chile Copper Company	5%	1947	9,587.50
25,000	Scovill Mfg. Co.	5½%	1945	24,750.00
60,000	Standard Oil Co. of N. Y.	4½%	1951	58,972.97
25,000	Texas Corp., Conv. Deb.	5%	1944	25,334.00
33,000	United Biscuit Co. of America	5%	1950	33,462.00
35,000	Amer. Tel. & Tel. Co.	5%	1946	35,773.00
30,000	Bell Tel. Co. of Pa.	5%	1948	32,171.00
10,000	Cedars Rapids Mfg. & Pr. Co.	5%	1953	10,000.00
25,000	Central Hudson Gas & Elec. Co.	5%	1957	25,000.00
24,000	Connecticut Light & Power Co.	5%	1962	22,865.00
25,000	Detroit Edison Company	5%	1949	24,315.65
29,000	Mississippi River Power Co.	5%	1951	29,384.00
25,000	Narragansett Electric Co.	5%	1958	25,222.00
30,000	N. Y. Edison Co., 1st & Ref.	5%	1951	29,025.00
40,000	N. Y. Power & Light Corp.	4½%	1967	39,499.62
40,000	Public Service Elec. & Gas Co.	4%	1971	40,537.00
30,000	Tennessee Elec. Power Co.	5%	1956	29,900.00
20,000	Western Union Tel. Co.	5%	1938	18,597.70
25,000	Atlantic Coast Line, 1st	4%	1952	24,753.15
25,000	Baltimore & Ohio R. R.	4%	1948	25,236.00
10,000	Canadian National Rwy.	4½%	1957	9,775.00
25,000	Canadian Pacific Rwy.	5%	1944	25,379.00
30,000	Chicago, Burlington & Quincy R.R.	3½%	1949	29,399.08
5,000	Chicago & North Rwy. Eq. Tr.	5%	1937	5,000.00
16,000	Kansas City, Mem. & Burl. R.R.	5%	1934	16,000.00
40,000	Kansas City Terminal	4%	1960	41,968.00
30,000	Long Island R.R.	4%	1949	29,775.00
25,000	Pere Marquette Rwy. Co.	4½%	1980	24,812.50
25,000	Southern Pacific	4%	1955	23,812.50
40,000	Union Pacific R.R. Co.	4½%	1967	37,326.95
$902,000				$898,433.62

The market value of these securities as of June 30, 1935 was $932,760.

* The Institute appropriates annually the equivalent of the 5% salary deduction, using 2% for payment of group insurance premiums.

F. R. HART
K. T. COMPTON
D. C. JACKSON
C. W. DOTEN
H. S. FORD
Trustees.

Respectfully submitted,

HORACE S. FORD,
Treasurer.

September 16, 1935.

SCHEDULE A

FINANCIAL RESULT OF OPERATION FOR YEAR ENDED JUNE 29, 1935

	Regular Courses Budget	*Research and Funds Non-Budget*	*Total*
Operating Income (Schedule B) . .	$2,694,798.59	$700,741.50	$3,395,540.09
Operating Expense (Schedule C) . .	2,694,559.86	961,499.60	3,656,059.46
Excess Income, Budget Operation	$238.73		
Excess Expense, Non-Budget Operation		$260,758.10	
Net Excess Expense, Total Operation			$260,519.37
To meet this Excess Expense the following amounts were available:			
(1) Profit and Loss, balance from previous years' operation (Schedule S)		$4,688.69	
(2) Special Funds for Excess Expense, Non-Budget Operation		260,758.10	265.446,79
Thus there remained a Balance applicable to reduction of Current Deficit (Schedule S)			$4,927.42

SCHEDULE B

OPERATING INCOME FOR YEAR 1934–1935

	Regular Courses Budget	*Research and Funds Non-Budget*	*Total*
INCOME FROM STUDENTS:			
(*a*) Tuition Fees	$1,238,013.35	.....	.....
Locker Fees	623.73	.....	.....
Entrance Examination Fees	1,680.00	.....	.....
Condition Examination Fees	4,732.75	.....	.....
Late Registration Fees	1,090.00	.....	.....
Net Dormitory Income (Schedule B-1)	25,865.36	.....	.....
	$1,272,005.19	.....	$1,272,005.19
INCOME FROM INVESTMENTS:			
Endowments, General Purposes (Schedule M)	$1,204,904.50	$10,190.23	$1,215,094.73
Endowments, Designated Purposes (Schedule M)	69,359.10	196,895.42	266,254.52
Net (Schedule M)	$1,274,263.60	$207,085.65	$1,481,349.25
INCOME FROM OTHER SOURCES:			
Federal Aid from Acts, 1862–90	$22,255.00	.....	.....
1933–34 Reserve Income	12,808.01	.....	.....
Contributions for Teaching and Research (Schedule B-2)	26,816.67	.....	.....
Division of Laboratory Supplies	11,405.97	.....	.....
Trustees H. C. Frick Estate	5,000.00	.....	.....
Appropriations from Funds for Teaching and Research (Schedule B-3)	58,244.15	.....	.....
Huntington Hall Rental	3,500.00	.....	.....
Walker Building, Boston	7,500.00	.....	.....
Miscellaneous	1,000.00	.....	.....
	$148,529.80	.....	$148,529.80
CURRENT FUND EARNINGS:			
Total (Schedule R)	.....	$493,655.85	$493,655.85
TOTAL OPERATING INCOME (Schedule A)	$2,694,798.59	$700,741.50	$3,395,540.09

(*a*) TUITION FEES — Cash, Institute Year 1934–35 . . . . . $849,050.28
Cash, Summer Session 1934 . . . . . 78,337.28
Fees Receivable 1,102.29
Undergraduate Scholarships 69,704.00
Graduate Scholarships 83,212.75
Technology Loan Fund, Loans 152,656.75
Emerson Fund 3,950.00
Total $1,238,013.35

SCHEDULE C

OPERATING EXPENSE FOR YEAR 1934–1935

	Regular Courses Budget	*Research and Funds Non-Budget*	*Total*
ACADEMIC EXPENSES:			
Salaries of Teachers (C-1)	$1,443,925.58	.....	.....
Wages Accessory to Teaching (C-1)	49,687.84	.....	.....
Wages, Laboratory Service (C-1)	71,796.87	.....	.....
Department Expenses (C-2)	123,062.29	.....	.....
General Library (C-3)	54,027.83	.....	.....
	$1,742,500.41	.....	$1,742,500.41
ADMINISTRATION EXPENSES:			
Salaries, Officers	$91,200.00	.....	.....
Wages, Clerical Staff (C-4)	73,156.82	.....	.....
Expenses, Offices (C-5)	26,754.75	.....	.....
Bulletins and Publicity (C-6)	9,082.64	.....	.....
General Expense (C-7)	116,236.06	.....	.....
	$316,430.27	.....	$316,430.27
PLANT EXPENSES:			
Wages, Building Service (C-8)	$111,169.34	.....	.....
Power Plant Operation (C-9)	93,174.25	.....	.....
Fire Insurance (Net)	3,381.35	.....	.....
Repairs and Alterations (C-10)	123,243.81	.....	.....
	$330,968.75	.....	$330,968.75
MISCELLANEOUS EXPENSES:			
Department of Hygiene (C-11)	$60,846.41	.....	.....
Summer Camps 1934 (C-12 and C-13)	5,847.19	.....	.....
Division of Industrial Coöperation	3,620.83	.....	.....
Athletic Field, Boat House and Launches (C-14)	16,405.37	.....	.....
Special Appropriations (C-16)	196,284.46	.....	.....
*Walker Memorial (C-17)	21,656.17	.....	.....
	$304,660.43	.....	$304,660.43
EXPENSES OF CURRENT FUNDS:			
Total (Schedule R)	.....	$806,239.42	$806,239.42
AWARDS FROM FUNDS:			
Total (Schedule C-18)	.....	$140,597.78	$140,597.78
PAYMENTS FROM SPECIAL FUNDS:			
Total (Schedule C-19)	.....	$14,662.40	$14,662.40
TOTAL OPERATING EXPENSE (Schedule A)	$2,694,559.86	$961,499.60	$3,656,059.46

* Not including Dining Service (see Schedule C-15).

SCHEDULE B-1
DORMITORY OPERATION (Net)

Income:			
From Rentals		$134,145.72	
Less Refunds		5,398.42	
		$128,747.30	
From Miscellaneous		2,561.15	
Total			$131,308.45
Expenses:			
Salaries		$41,584.71	
Laundry		2,683.70	
Heat, Light, Power		16,012.34	
Water		2,023.00	
Repairs		15,474.04	
Supplies	$6,803.91		
Less Inventory (June 29, 1935) (Schedule D-2)	3,803.19		
		3,000.72	
Printing, Administration, Telephone		3,245.34	
New Furniture and Furnishings		13,919.24	
Interest on Mortgage Loan (Whitney Fund)		7,500.00	
Total			105,443.09
Net Income (Schedule B)			$25,865.36

SCHEDULE B-2
CONTRIBUTIONS FOR TEACHING AND RESEARCH

Prof. William Emerson	Arch. Dept. (City Planning)	$1,666.67
Carnegie Corporation	Arch. Dept. (City Planning)	4,000.00
Anonymous	Chemical Eng. Dept.	2,000.00
National Academy of Science	Chemical Eng. Dept.	1,000.00
L.J. & M.E.Horowitz Foundation	Civil Eng.Dept.(Bldg.Const.)	9,000.00
American Tel. & Tel. Co.	Elec.Eng.Dept.(Course VI-A)	3,750.00
General Electric Co.	Elec.Eng.Dept.(Course VI-A)	3,750.00
Emerg.Com.for German Scholars	Mathematics Dept.	1,650.00
		$26,816.67

SCHEDULE B-3
APPROPRIATIONS FROM FUNDS FOR TEACHING AND RESEARCH

Biology Research Fund	Biology Dept.	$1,790.00
Health Education Res. Fund	Biology Dept.	1,200.00
W. T. Sedgwick Fund	Biology Dept.	7,000.00
Cabot Fund	Chemical Eng. Dept.	1,937.96
Ellen H. Richards Fund	Chemistry Dept.	600.00
Edward Whitney Fund	Civil Eng. Dept.	2,200.00
Industrial Fund	Division of Industrial Res.	3,620.83
Electrical Eng. Special Fund	Electrical Eng. Dept.	4,500.00
Geology Rockefeller Res. Fund	Geology Dept.	1,600.00
Edward Whitney Fund	Geology Dept.	7,110.00
William Nickerson Fund	Humanics Dept.	5,385.36
Textile Research Fund	Mechanical Eng. Dept.	10,800.00
U.S.Navy Vibration Res. Fund	Mechanical Eng. Dept.	6,000.00
Physics Rockefeller Res. Fund	Physics Dept.	4,500.00
		$58,244.15

SCHEDULE C-1

SALARIES OF TEACHERS, WAGES ACCESSORY TO TEACHING AND LABORATORY SERVICE

Department	*Teachers Salaries*	*Wages Accessory to Teaching*	*Wages Laboratory Service*
Summer Session, 1934	$59,269.27	.....	.....
Aeronautical Engineering	80,664.00	$2,108.30	.....
Architecture	67,100.00	3,655.53	$3,252.00
Biology and Public Health	44,610.00	1,393.70	1,820.00
Business and Eng. Administration	54,530.00	1,927.99	.....
Chemistry	135,920.70	4,817.88	6,114.50
Chemical Engineering	56,437.96	2,939.93	3,752.00
Chemical Engineering Practice School	12,300.00	.....	.....
Civil Engineering	101,923.52	4,072.78	.....
Division of Laboratory Supplies	.....	.....	21,254.30
Drawing	24,200.00	312.00	.....
Economics	38,500.00	3,084.00	.....
Electrical Engineering	137,933.00	6,097.63	11,699.32
English and History	55,400.00	1,074.23	.....
General Eng. and General Science	1,000.00	*.....	.....
General Studies	1,600.00	.....	.....
Geology	45,709.83	2,686.39	338.40
Humanics	5,000.00	*.....	.....
Lantern Operation	.....	.....	1,119.53
Mathematics	59,550.00	1,176.14	.....
Mechanical Engineering	172,738.00	5,161.51	13,492.15
Military Science	7,630.00	1,038.46	.....
Mining and Metallurgy	84,680.80	2,648.08	4,678.83
Modern Languages	17,000.00	427.50	.....
Naval Architecture	33,550.00	1,578.86	1,837.51
Physics	146,678.50	3,486.93	2,438.33
Totals (Schedule C)	$1,443,925.58	$49,687.84	$71,796.87

* Included in appropriation for Department Expenses (Schedule C-2).

SCHEDULE C-2

*DEPARTMENT EXPENSES (Net)

Department	*Expense (Net)*	*Overdraft*
Architecture	$5,922.38	.....
Biology	*2,700.00	.....
Business and Engineering Administration	4,130.00	$260.18
Chemistry	*17,619.66	.....
Chemical Engineering	5,200.00	.....
Chemical Engineering Practice School	7,464.08	.....
Civil Engineering	*2,170.00	5.52
Drawing	315.00	.....
Economics	1,357.88	.....
Electrical Engineering	*20,369.78	.....
English and History	315.00	28.08
General Engineering and General Science	520.92	.....
General Studies	104.10	.....
Geology	1,900.00	258.99
Humanics	335.36	.....
Mathematics	*350.00	10.49
Mechanical Engineering	*21,100.00	137.13
Military Science	1,308.72	.....
Mining and Metallurgy	*6,474.65	.....
Modern Languages	206.97	.....
Naval Architecture	764.24	.....
Physics	*22,100.00	.....
United States Army and Navy Officers	333.55	.....
Totals	$123,062.29	$700.39
	(Schedule C)	(Schedule D)

SCHEDULE C-3

GENERAL LIBRARY

	Expense (Net)
Salaries of Officers	$13,972.64
Wages, Clerical Staff	24,652.09
Expenses	*15,403.10
Totals	$54,027.83
	(Schedule C)

*Certain special appropriations not included (see Schedule C-16).

SCHEDULE C-4
WAGES, CLERICAL STAFF, ADMINISTRATION OFFICES

President and Vice-President	$5,503.76
Dean of Science	1,020.00
Dean	2,030.25
Registrar	24,604.47
Director of Admissions	6,721.58
Bursar	21,516.35
Superintendent	7,104.00
Undergraduate Scholarship and Loan Fund Board	4,656.41
Total (Schedule C)	$73,156.82

SCHEDULE C-5
EXPENSES, ADMINISTRATION OFFICES

President and Vice-President	$2,879.70
Dean of Science	151.85
Dean	833.73
Registrar	10,529.14
Director of Admissions	1,144.20
Bursar	5,956.97
Superintendent	1,192.52
Undergraduate Scholarship and Loan Fund Board	2,407.55
Graduate School and Scholarship Committee	291.41
New Student Publicity Account	1,367.68
Total (Schedule C)	$26,754.75

SCHEDULE C-6
BULLETINS AND PUBLICITY

Advertising — M. I. T. Publications	$1,204.64
Printing — President's and Treasurer's Reports	1,201.00
Directory	552.00
Summer Session 1935	1,652.00
General Catalogue	4,473.00
Total (Schedule C)	$9,082.64

SCHEDULE C-7
GENERAL EXPENSE

News Service	$2,253.17
Allowances	25,900.00
Pensions	12,602.92
Care of Securities	20,000.00
Workmen's Compensation and General Liability Insurance, etc.	6,392.42
Taxes, Cambridge and Maine	6,840.66
Auditing	1,000.00
Miscellaneous Dues, Fees, etc.	1,714.97
Receptions, Graduation	5,290.66
Ice — ice water	673.37
Trucking of Mail	1,044.29
Travel	6,949.90
Telephone Service	19,562.55
Catalogue of Former Students	5,773.10
M. I. T. Service Accounts	3,298.80
Total	$119,296.81
Less Credits	3,060.75
Total (Schedule C)	$116,236.06

SCHEDULE C-8

WAGES, BUILDING SERVICE

Shop Foremen (net)	$3,072.54
Janitors: Supervisory and Staff	50,709.46
Night Cleaners	20,352.86
Watchmen (including Cambridge Police)	12,750.03
Window Cleaning	7,885.98
Heating and Ventilation	8,698.31
Messengers, Mail, Elevator, Shipper, Stock Room	7,700.16
Total (Schedule C)	$111,169.34

SCHEDULE C-9

POWER PLANT OPERATION (Net)

Oil	$60,449.46
Coal	2,469.76
Water	1,827.00
Supplies	3,127.54
Repairs	5,935.38
Trucking, etc.	369.40
Salaries	25,896.80
Electricity, Rogers Building	2,659.94
Oil Burning Conversion (⅓ cost)	15,681.68
Total	$118,416.96
Less Transfers and Credits	25,242.71
Total (Schedule C)	$93,174.25

SCHEDULE C-10

REPAIRS, ALTERATIONS AND MAINTENANCE

Buildings 1, 2, 3, 4, 5, 6, 8, 10, 11	$42,549.03
Rogers Building, Boston	5,615.43
Buildings No. 30, 31, 33, 35, 36, 38, 46	9,475.88
Miscellaneous Wooden Buildings, etc.	640.96
Alterations	5,684.06
President's House	4,797.98
Furniture	3,432.40
Elevators	1,767.08
Mains and Conduits	9,296.20
Water	8,917.10
Gas	2,087.69
Grounds, Roads, Tennis Courts, etc.	24,256.68
Building Protection	1,230.73
Rubbish	1,983.26
Undistributed (net)	1,509.33
Total (Schedule C)	$123,243.81

SCHEDULE C-11
DEPARTMENT OF HYGIENE

Salaries, Medical Director, Assistants and Infirmary Staff	$30,507.12
Additional Medical Services	1,086.66
Physical Training and Coaching	*20,931.50
Medical and Other Supplies	2,005.75
Physical Examinations	2,960.83
Equipment	499.60
Food Account (Net)	1,016.43
Laundry	1,290.97
Miscellaneous	547.55
Total (Schedule C)	$60,846.41

*Special appropriations not included (see schedule C-16).

SCHEDULE C-12
CIVIL ENGINEERING SUMMER CAMP (1934)
TECHNOLOGY, MAINE

**Income:*		
From Students and Staff	$3,446.18	
Miscellaneous	30.99	
Total Income		$3,477.17
**Expenses:*		
Travel Expense	$345.16	
Construction and Repairs	739.22	
Caretaker	1,440.00	
Taxes and Insurance	1,337.29	
Administration, Telephone, etc.	592.14	
Wages — Operating	800.00	
Provisions and Supplies	1,852.46	
Coal, Wood, Gas and Ice.	696.19	
Express and Freight, Laundry	146.90	
Total Expense		7,949.36
Net Expense		$4,472.19

SCHEDULE C-13
MINING ENGINEERING SUMMER CAMP (1934), DOVER, N. J.

**Income:*		
From Students and Staff	$837.40	
Miscellaneous	11.34	
Total Income		$848.74
**Expenses:*		
Travel Expense	$105.60	
Repairs and Equipment	372.96	
Caretaker, Insurance, Tel., Adm., Light	947.64	
Wages — Operating	400.00	
Provisions and Supplies	397.54	
Total Expense		2,223.74
Net Expense		$1,375.00
Total Expense of Camps (Schedule C)		$5,847.19

*Tuition Receipts and Staff Salary payments included in Summer Session, pp. 120 and 123.

SCHEDULE C-14

ATHLETIC FIELD, BOAT HOUSE, LAUNCHES

Athletic Field, Maintenance	$10,313.99
Boat House, Maintenance	4,155.55
Launches, Maintenance	1,935.83
Total (Schedule C)	$16,405.37

SCHEDULE C-15

DINING SERVICE (Net)

Inventory, June 30, 1934:		
Utensils	$9,264.60	
Stock	1,670.65	
		$10,935.25
Expenditures:		
Food	$43,020.48	
Salaries	38,093.84	
Light, Heat and Water	4,436.39	
Ice, Refrigeration	246.50	
Laundry	1,412.91	
Dining Room and Kitchen Equipment	1,378.51	
Repairs	813.95	
Printing and Advertising	935.13	
Administration Expense	594.61	
Insurance	824.90	
		91,757.22
Total		$102,692.47
Income:		
Coupon Books	$39,148.96	
Less Outstanding Coupons (Schedule D)	124.28	
	$39,024.68	
Cash	49,467.64	
Drawn from Dining Service Reserve Fund	2,268.82	
Charged to General Expense	885.39	
		$91,646.53
Inventory, June 29, 1935:		
Utensils	$8,454.05	
Stock	2,591.89	
		11,045.94
Total		$102,692.47

SCHEDULE C-16
SPECIAL APPROPRIATIONS

Graduate Students and Staff Tuition Awards				$35,955.00
Undergraduate Dues				17,115.00
Pension and Insurance Plan — Staff				65,686.03
Insurance Plan — Employees				4,869.46
Society of Arts				2,289.35
Special Tuition Awards				1,000.00
Biography, Dr. Richard C. Maclaurin				800.00
Travel Allowances — New Staff Appointments				2,165.00
Special Travel Appropriation, No. 1052				2,000.00
New Office Equipment				595.96
Dormitory Rent — Award				235.00
No. 1041, State Highway Accident Survey				475.00
No. 1045, Exhibit, Pittsburgh Meeting, A. A. A. S.				622.30
No. 1053, News Bulletin—Tech Review				600.00
No. 1058, Placement Training Committee				300.00
No. 1067, Open House				1,085.03
No. 1070, Walker Memorial Concerts — Musical Clubs				75.00
No. 1073, Aldred Lecture Fund				500.00
No. 1074 and 1075, President's Fund				250.00
No. 1079, Professor Hardy's Color Analysis				1,700.00
No. 1080, Publicity:			Total	7,711.78
1935 Register of Former Students			$2,000.00	
President's Letter to Alumni			1,431.87	
Visual Education (Animated Motion Pictures)			3,500.00	
Bulletin on Ceramics			186.82	
1935 Alumni Reunion			364.00	
Techniques for Director of Admissions			150.00	
High School Saturday Afternoon Visits			79.09	
No. 1093, Publicity—Science Leaflet				180.00
No. 1087, Public Address System				96.64
No. 1089, Grading land — West of Massachusetts Avenue				5,000.00
To DEPARTMENTS:				
Biology			Total	2,700.00
Food Research	$1,200.00	Health Edu. Res.	$1,500.00	
Chemistry			Total	250.00
No. 1065	$250.00			
Civil Engineering			Total	3,100.00
Soil Mechanics	$800.00	No. 1056	$2,300.00	
Electrical Engineering			Total	10,146.00
Diff. Analyzer	$2,700.00	No. 1061	$546.00	
No. 1036	$1,000.00	No. 1066	$1,550.00	
No. 1047	$600.00	No. 1082	$500.00	
No. 1048	$750.00	No. 1085	$2,500.00	
Hygiene			Total	150.00
No. 1064	$150.00			
Library			Total	300.00
No. 1011	$300.00			
Mathematics			Total	150.00
Special Lecturers	$150.00			
Mechanical Engineering			Total	16,720.91
Met. Work. Lab.	$15,334.20	No. 1063	$250.00	
Textile School	$296.81	No. 1083	$139.90	
No. 1039	$200.00	No. 1088	$500.00	
Mining Engineering			Total	275.00
No. 1072	$275.00			
Physics			Total	11,186.00
Nuclear Research	$9,232.00	No. 1061	$454.00	
No. 1044	$1,500.00			
Total (Schedule C)				$196,284.46

SCHEDULE C-17
WALKER MEMORIAL (Net)

Income:		
Games		$88.23
Expenses:		
Salaries	$8,667.07	
Light, Heat, Power	5,413.62	
Water	695.56	
Repairs, Alterations, Maintenance	5,932.69	
Trucking, Administration	33.15	
Equipment, Supplies, Magazines and Papers	1,002.31	
Total		21,744.40
Net Expense (Schedule C)		$21,656.17

SCHEDULE C-18
AWARDS FROM FUNDS

Teachers' Fund, for Retiring Allowances	$3,825.00
Robert A. Boit Fund, for Prizes	240.00
Class of 1904 Fund, for Prize	10.00
Arthur Rotch Prize Funds, for Prizes	200.00
James Means Prize Fund, for Prizes	131.90
Roger Defriez Hunneman Fund, for Prizes	50.00
Samuel W. Stratton Fund, for Prizes	111.50
Frances and William Emerson Fund, for Student Aid	4,275.00
William Barton Rogers Fund, for Student Loans	2,693.75
Bursar's Fund, for Student Loans	2,428.16
Dean's Fund, for Student Loans	86.97
Summer Surveying Camp Fund, for Loans	100.00
Edward Austin Fund, for Graduate Scholarships	18,000.00
Jonathan Whitney Fund, for Graduate Scholarships	23,000.00
Misc. Funds, for Graduate Scholarships and Fellowships	12,741.50
Misc. Funds for Undergraduate Scholarships	69,704.00
Jonathan Whitney Fund, for Technology Christian Association	3,000.00
Total (Schedule C)	$140,597.78

SCHEDULE C-19

PAYMENTS FROM INCOME OF SPECIAL FUNDS

Walter S. Barker, for Books	$334.10	
Frank Harvey Cilley, for Books, etc.	3,690.75	
Charles Lewis Flint, for Books	205.87	
William Hall Kerr, for Books	15.03	
George A. Osborne, for Books	359.33	
Technology Matrons' Fund, for Teas	411.97	
John Hume Tod, for Books	74.27	
Theodore N. Vail, for Vail Library	1,600.00	
Ednah Dow Cheney, for Margaret Cheney Room	1,546.42	
Edward D. Peters, for Mineralogy Department	250.00	
F. Jewett Moore, for Chemical Department	150.51	
F. W. Boles Memorial, for Architectural Department	322.19	
Edmund K. Turner, for Annuity and Tax	2,068.98	
Pratt Naval Architectural, for Nautical Museum and Annuity	2,228.18	
Crosby Honorary, for Geology	36.66	
Arthur Rotch, for Books	409.63	
Sedgwick Memorial Lecture, Expenses	293.51	
Ellen H. Richards, for Research	665.00	
Total (Schedule C)		$14,662.40

SCHEDULE D

TREASURER'S BALANCE SHEET

1

ENDOWMENT FUNDS, ASSETS

Securities and Real Estate (Schedule H)	$31,392,954.76
Loaned for Current Purposes (Contra)	88,425.21
Cash: For Investment (Schedule D-3)	286,269.96
Total June 29, 1935	$31,767,649.93

2

STUDENT LOAN ASSETS

Notes Receivable (Schedule P)	$719,608.12
Total June 29, 1935	$719,608.12

3

CURRENT ASSETS

Cash: For General Purposes (Schedule D-3)	$8,793.24
Accounts Receivable (Schedule D-1)	17,471.44
Students' Fees, Receivable	1,102.29
Students' Deposits, Receivable	744.12
Deposit on Fire Insurance Account	44,475.00
Inventories and Advances for 1935–36 (Schedule D-2)	102,417.94
Deferred Expense Accounts (Schedule D-4)	53,526.00
Current Deficit (Schedule S)	24,951.22
Total June 29, 1935	$253,481.25

4

PLANT ASSETS

Land, Buildings, and Equipment	$15,733,443.41
Total June 29, 1935 (Schedule J)	$15,733,443.41
Total Assets June 29, 1935	$48,474,182.71

SCHEDULE D

JUNE 29, 1935

1

ENDOWMENT FUNDS, CAPITAL

Endowment Funds (Schedule M)	$31,767,649.93
Total June 29, 1935	$31,767,649.93

2

STUDENT LOAN CAPITAL

Total (Schedule P)	$719,608.12
Total June 29, 1935	$719,608.12

3

CURRENT LIABILITIES

Current Funds (Schedule R)	$107,170.93
Accounts Payable	3,600.63
Students' Fees and Deposits (Schedule D-5)	54,088.38
*Undergraduate Dues, Balance	71.82
Dining Room Coupons, Outstanding	124.28
Borrowed from Investment Assets (Contra)	88,425.21
Total June 29, 1935	$253,481.25

4

EDUCATIONAL PLANT CAPITAL

Endowment for Educational Plant	$15,733,443.41
Total June 29, 1935 (Schedule K)	$15,733,443.41
Total Liabilities June 29, 1935	$48,474,182.71

*See also Undergraduate Dues Reserve (Schedule M, p. 151).

SCHEDULE D-1
DETAIL OF ACCOUNTS RECEIVABLE

Division of Industrial Coöperation	$3,528.22
Investment Income	2,291.07
Horowitz Foundation	3,000.00
Wyeth Fund	2,997.33
Miscellaneous Accounts	5,654.82
Total (Schedule D)	$17,471.44

SCHEDULE D-2
DETAIL OF ADVANCES AND INVENTORIES FOR 1935–1936

Department Overdrafts (Schedule C-2)	$700.39
Summer Session Salaries, Advanced	3,012.00
Salary Advances 1935–36	12,410.00
Civil Engineering Summer Camp 1935, Advanced	526.76
Mining Engineering Summer Camp 1935, Advanced	152.67
Premiums Paid on Unexpired Insurance	3,442.19
Inventories — Notes held by Coöperative Society and M.I.T.	3,841.22
Dormitory Supplies	3,803.19
Dining Service, Food, Utensils, etc.	11,045.94
Oil	1,140.40
Walker Memorial Games, Candy, Cigars, etc.	236.09
Letter Shop Supplies	1,005.49
Stamps	200.85
Office Supplies	983.55
Building and Janitors' Supplies	2,054.34
Architectural Students' Supply Room, Stock	1,621.04
Stock Room: Pipe, Fittings, Lumber, Hardware, Paint, Oil, Glass and Miscellaneous Supplies	12,911.71
Photostat Service, Supplies, Equipment, etc.	1,008.50
Photographic Service, Supplies and Equipment	5,021.78
Division of Laboratory Supplies: Chemicals, Glassware, Platinum, etc.	34,650.43
Liquid Soap	160.24
Blue Print Service, Supplies and Equipment	2,489.16
Total (Schedule D)	$102,417.94

SCHEDULE D-3

TOTAL CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR

Total Cash Receipts	$8,569,493.00
Total Cash Disbursements	8,652,996.25
Excess of Disbursements	$83,503.25
Cash, June 30, 1934	378,566.45
Cash, June 29, 1935	$295,063.20

CASH BALANCE

Cash for Investment — on Deposit (Schedule D)		$286,269.96
Cash for Current Purposes (Schedule D)		
On Deposit	$6,612.81	
In Office	2,180.43	
		8,793.24
Total Cash (Schedule D)		$295,063.20

SCHEDULE D-4

DEFERRED EXPENSE ACCOUNTS

Power Plant Conversion (Bal.)	$14,400.00
Graduate Dormitories	34,800.00
Undergraduate Dormitories, Equipment	4,326.00
	$53,526.00

SCHEDULE D-5

STUDENTS' FEES IN ADVANCE, AND DEPOSITS RETURNABLE

Tuition Fees, Summer Session 1935	$45,795.50
Students' Deposits Returnable	1,039.82
Students' Deposits, Summer Session 1935	2,716.06
Students' Deposits in Advance 1935–36	25.00
Dormitory Rental in Advance 1935–36	15.00
Dormitory Rentals, Summer Session 1935	4,337.00
Students' Deposits, account C. E. Summer Camp and Mining Camp	160.00
Total (Schedule D)	$54,088.38

SCHEDULE H

INVESTMENTS — GENERAL

Par Value				*Book Value*	*Net Income*
	GOVERNMENT BONDS				
$500,000	Boston, Met. Dist...	4¾s	1944–59	$483,534.60	$23,750.00
260,000	Canada.....	5s	1952	258,511.88	13,000.00
115,000	Detroit.....	4s	1943–46	108,846.60	243.88
35,000	Detroit.....	4½s	1945–56	34,345.98	160.00
40,000	Detroit.....	5s	1945	40,955.00	500.00
275,000	Ontario.....	5s	1942–59	275,675.00	13,760.95
50,000	Ontario.....	6s	1943	51,798.00	3,000.00
129,000	Ottawa.....	5s	1940–54	129,915.00	6,450.00
33,000	Ottawa.....	6s	1936–51	33,979.00	1,980.00
100,000	Quebec.....	4½s	1950	97,000.00	4,500.00
50,000	San Francisco.....	4½s	1952–54	50,553.00	2,250.00
24,325	Toronto.....	4s	1948	22,622.25	973.33
32,000	Toronto.....	5s	1939–42	31,485.80	1,600.00
50,000	Toronto.....	6s	1944–46	51,281.00	3,000.00
100,000	United States of Am.	1½s	1936	100,738.00	1,041.71
15,000	United States of Am.	3¼s	1946	15,893.00	.....
200,000	United States of Am.	4s	1954	214,398.25	4,955.55
	Income from bonds sold or matured				21,280.82
$2,008,325	*Total Government and Municipal Bonds*			$2,001,532.36	$102,446.24
	INDUSTRIAL BONDS				
$50,000	American Radiator..	4½s	1947	$48,000.00	$2,250.00
200,000	Armour, R.E., 1st...	4½s	1939	175,116.25	9,000.00
50,000	Armour, Del.....	5½s	1943	41,125.00	2,750.00
90,000	Chile Copper, Deb...	5s	1947	87,080.00	4,500.00
300,000	Cons. Coal, 1st.....	5s	1950	268,806.25	.....
100,000	Glidden.....	5½s	1939	99,750.00	5,500.00
100,000	Int. Cement.....	5s	1948	99,500.00	5,000.00
100,000	Midvale Steel & Ord.	5s	1936	100,000.00	5,000.00
*100,000	Nat. Dairy Products.	5¼s	1948	103,518.00	*633.06*
195,000	Pocahontas Corp. ...	6s	1943	146,678.28	15,228.67
100,000	Remington Rand A .	5½s	1947	101,987.00	785.58
100,000	Scovill Mfg.....	5½s	1945	99,000.00	1,008.33
17,000	Smith & Wesson 1st.	5½s	1938	16,830.00	935.00
125,000	Standard Oil, N.Y...	4½s	1951	122,641.02	5,512.62
74,000	Swift & Co., 1st	5s	1944	69,883.13	3,700.00
75,000	Texas Corp.....	5s	1944	75,468.00	3,750.00
100,000	United Drug.....	5s	1953	100,000.00	5,000.00

*Items under Net Income shown in *italics* indicate accrued interest paid or excess expense over income.

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	INDUSTRIAL BONDS (*Continued*)				
$50,000	Waltham Watch, 1st.	6s	1943	$49,000.00	$3,000.00
190,000	Western Elec., Deb..	5s	1944	188,288.75	9,500.00
50,000	Woodward Iron, 1st .	5s	1952	42,750.00	.....
	Income from bonds sold or matured				13,206.25
$2,166,000	*Total, Industrial Bonds*			$2,035,421.68	$94,993.39
Shares					
	*INDUSTRIAL STOCKS				
1,500	Air Reduction.....		(3)	$158,703.97	$4,500.00
250	Algonquin Printing.....		(4)	67,500.00	1,500.00
1,500	American Can.....		(4)	179,585.97	5,500.00
1,053	American Mfg., Pfd.....		(2)	46,332.00	4,475.25
1,020	Anaconda Copper, Cap.....			28,744.00	.....
700	Beech-Nut Packing.....		(3)	56,715.95	.....
2,000	Borden, Cap.		(1.60)	47,638.33	800.00
1,200	Caterpillar Trac.....		(1)	50,080.98	600.00
4,000	Cent. Aguirre Asso.....		(1.50)	114,020.16	3,750.00
370	Cerro de Pasco.....		(4)	18,870.00	740.00
2,500	Continental Can.....		(2.40)	131,876.26	5,325.00
2,000	Corn Products Ref.....		(3)	147,043.90	4,503.00
1,500	Curtis Pub., Pfd.....		(7)	141,448.04	8,250.00
1,500	Draper Corp.....		(2.40)	85,882.00	4,088.00
2,000	duPont de Nemours		(2.60)	188,389.38	4,625.00
23,250	Eastman Kodak.....		(5)	2,018,699.85	141,250.00
7,500	General Electric.....		(.60)	117,009.60	2,700.00
4,000	General Motors.....		(1)	136,065.15	4,750.00
3,000	Gold Dust.....		(1.20)	48,364.12	150.00
1,020	Inter. Bus. Mach.....		(6)	143,576.55	5,130.00
3,000	Inter. Harvester.....		(.60)	113,863.98	900.00
4,000	Inter. Nickel Can.....		(.60)	104,123.89	1,520.00
1,000	Johns-Manville.....		(.25)	51,997.50	.....
1,000	Liggett & Myers, B.....		(4)	107,401.19	3,000.00
2,500	R. H. Macy.....		(2)	119,692.70	4,250.00
700	Minn.-Honeywell Reg.....		(3)	57,428.43	400.00
133⅓	Mission Corp.....			1,266.67	.....
2,500	Monsanto Chemical.....		(1)	115,413.44	2,625.00
5,000	National Biscuit.....		(1.60)	165,768.74	5,000.00
1,500	Owens-Illinois Glass		(4)	130,326.59	4,750.00

* Common except as indicated.

Schedule H (*Continued*)

Shares			*Book Value*	*Net Income*
	INDUSTRIAL STOCKS (*Continued*)			
2,500	Pittsburgh Plate Glass	(2)	$117,865.55	$3,720.00
3,000	Procter & Gamble.....	(1.50)	122,127.26	3,912.50
497	Pullman, Cap.	(3)	36,961.83	1,491.00
....	Quebradas Co.....	..	.....	2,400.00
250	Rhode Id. Mall. Iron, Pfd...	..	25,000.00	.....
75	Samson Cordage.....	(4)	5,000.00	450.00
1,000	Shell Un. Oil, Conv., Pfd...	..	97,750.00	.....
3,000	Standard Brands.....	(1)	65,850.36	3,000.00
3,500	Standard Oil, Cal., Cap.....	(1)	123,724.11	2,175.00
1,000	Standard Oil, Ind.....	(1)	34,012.50	1,000.00
4,500	Standard Oil, N. J.....	(1)	189,542.70	4,125.00
600	Stevens Linen.....	(10)	39,000.00	9,000.00
567	Texas Corp.....	(1)	14,175.00	567.00
2,100	Texas Gulf Sulphur.....	(2)	76,278.91	3,300.00
4,000	Union Carbide & Carbon...	(1.60)	190,674.31	3,625.00
1,000	United Carbon.....	(2.40)	52,325.78	.....
5,357	United Fruit, Cap.	(3)	220,979.50	14,731.75
2,480	United Shoe Mach.....	(2.50)	175,928.56	6,750.00
1,000	U. S. Steel, Pfd.....	(2)	103,412.85	2,000.00
2,500	Woolworth.....	(2.40)	128,762.70	5,400.00
	Income from stocks sold....			10,890.00
	Total, Industrial Stocks.....		$6,713,201.26	$303,618.50

Par Value					
	PUBLIC UTILITY BONDS				
$200,000	Alabama Power, 1st....	5s	1946	$191,501.25	$10,000.00
50,000	Alabama Power, 1st....	4½s	1967	49,125.00	2,250.00
61,000	American Tel. & Tel....	5s	1946	59,919.80	3,075.00
225,000	American Tel. & Tel....	5s	1960	216,928.00	11,250.00
200,000	Appal. El. Pr., 1st	5s	1956	203,262.00	10,000.00
70,000	Ark. Power & Lt., 1st ..	5s	1956	70,675.00	3,500.00
150,000	Bell Tel. of Penn.....	5s	1948	165,569.00	4,458.21
50,000	Blackstone Val.G&E,1st.	5s	1939	50,030.00	2,500.00
100,000	Boston Elevated.....	5s	1937	99,875.00	5,000.00
290,000	Cedars Rap. Mfg.&Pr.1st	5s	1953	276,853.85	14,500.00
50,000	Cincinnati G. & E., 1st .	4s	1968	49,750.00	2,000.00
50,000	Columbia G. & E.....	5s	1952	43,301.33	2,500.00
42,000	Conn. Light & Power, 1st	7s	1951	39,557.11	3,010.00
52,000	Conn. Light & Power, 1st	4½s	1956	49,465.00	2,340.00
75,000	Cons. Gas, N. Y.....	4½s	1951	75,442.00	3,375.00

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	PUBLIC UTILITY BONDS (*Continued*)				
$200,000	Cons. Gas, N. Y.	5½s	1945	$201,407.00	$11,000.00
248,000	Consumers Power, 1st...	4s	1944	248,072.00	4,436.45
50,000	Cont. Gas & El.....	5s	1958	42,500.00	2,500.00
100,000	Cumberl'd Cty. P.&L.1st	4½s	1956	94,362.50	3,695.62
51,000	Cumberland Tel.&Tel.1st	5s	1937	50,229.00	2,550.00
100,000	Dayton Pr. & Lt., 1st ..	5s	1941	102,250.00	5,000.00
100,000	Detroit Edison	5s	1952	105,220.00	4,252.92
100,000	Detroit Edison	4½s	1961	100,000.00	4,500.00
100,000	Duquesne Light, 1st....	4½s	1967	94,750.00	4,500.00
275,000	Edison El. Ill., Boston...	5s	1936	272,250.00	13,750.00
75,000	Edison El. Ill., Boston..	3s	1937	75,000.00	1,125.00
50,000	Fall River Elec. Lgt., 1st	5s	1945	50,947.00	2,500.00
50,000	Great Lakes Power, 1st..	6s	1943	43,187.50	3,000.00
100,000	Gulf States Util., 1st....	5s	1956	90,878.32	3,962.36
173,000	Hyd. Power-Niag. Falls .	5s	1951	165,139.00	8,650.00
59,000	Illinois Bell Tel., 1st....	5s	1956	56,712.50	2,950.00
50,000	Indianapolis Water, 1st .	5½s	1953	48,250.00	2,750.00
100,000	Jersey Cent. Pr.& Lt., 1st	5s	1947	102,425.00	3,847.36
100,000	Kans. City Pr. & Lt., 1st.	4½s	1961	99,721.25	4,500.00
200,000	Louisville G. & E., 1st...	5s	1952	184,546.25	10,000.00
200,000	Massachusetts Gas.....	5s	1955	195,500.00	10,000.00
100,000	Memphis Pr. & Lt., 1st.	5s	1948	94,720.49	3,538.47
50,000	Minnesota Pr. & Lt., 1st.	4½s	1978	48,500.00	2,250.00
110,000	Mississippi River Pr., 1st	5s	1951	102,414.84	5,500.00
50,000	Nevada California Elec..	5s	1956	47,750.00	2,500.00
150,000	N. Orleans Pub. Serv.,1st	5s	1952	134,375.00	7,500.00
50,000	New York Edison, 1st...	5s	1951	48,375.00	2,500.00
200,000	New York Telephone, 1st	4½s	1939	199,843.36	9,000.00
100,000	New York Pr. & Lt., 1st .	4½s	1967	95,571.01	4,381.00
100,000	North American.....	5s	1961	101,125.00	5,000.00
150,000	Nor. States Power	4½s	1961	147,125.00	6,750.00
100,000	Nor. States Power, 1st..	5s	1941	96,800.87	3,412.91
100,000	Ohio Power, 1st.....	4½s	1956	98,088.50	4,500.00
100,000	Oklahoma G. & E., 1st .	5s	1950	94,750.00	5,000.00
50,000	Ontario Power, 1st.....	5s	1943	49,312.50	2,500.00
100,000	Pacific G. & E., 1st	4½s	1960	98,368.75	4,500.00
175,000	Pacific G. & E., 1st	6s	1941	177,737.00	10,500.00
75,000	Pacific Tel. & Tel., 1st..	5s	1937	73,915.10	3,750.00
165,000	Penn-Ohio Edison.....	5½s	1959	168,653.00	9,075.00
100,000	Penn. Pr. & Light, 1st...	4½s	1981	96,250.00	4,500.00
50,000	Philadelphia Elec., 1st..	4s	1971	46,750.00	2,000.00
90,000	Potomac Elec. Pr.....	6s	1953	91,893.00	5,460.00

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	PUBLIC UTILITY BONDS (*Continued*)				
$75,000	Providence Gas, 1st	4s	1963	$74,437.50	$3,000.00
99,000	Pub. Serv., No. Ills., 1st .	4½s	1980	97,294.72	4,455.00
70,000	Pub. Serv. El. & Gas, 1st.	4s	1971	66,362.50	2,800.00
90,000	San Joaquin Light & Pr.	5s	1957	88,612.50	3,322.22
100,000	Shawinigan Water & Pr., 1st	4½s	1967	97,218.75	4,500.00
100,000	Shawinigan Water & Pr., 1st	5s	1970	101,209.00	5,000.00
50,000	Sierra Pacific Pr., 1st....	5½s	1957	44,875.00	2,750.00
100,000	Sierra & San Fran. Pr., 1st	5s	1949	103,551.00	3,260.70
100,000	Sou. Bell Tel. & Tel., 1st.	5s	1941	100,297.00	5,000.00
165,000	Southern Cal. Edison...	5s	1939	163,218.75	8,250.00
100,000	Southern Cal. Gas, 1st...	4½s	1961	89,250.00	4,500.00
50,000	Syracuse Lighting.....	5s	1951	54,374.00	2,500.00
48,000	Syracuse Lighting, 1st ..	5½s	1954	48,444.44	2,722.50
20,000	Tenn. Elec. Pr., 1st	5s	1956	19,750.00	1,000.00
50,000	Tenn. Power, 1st	5s	1962	46,625.00	2,500.00
300,000	Texas Pr. & Light, 1st..	5s	1937	291,437.50	15,000.00
100,000	Union El. Lgt. & Pr., 1st	5s	1957	98,875.00	5,000.00
50,000	Virginia El. & Pr., 1st ..	5s	1955	45,125.00	111.11
100,000	West Penn. Pr., 1st	5s	1963	93,482.50	5,000.00
100,000	Western Mass.....	4s	1939	100,260.00	1,733.34
200,000	Western Union Tel.....	5s	1951	200,826.00	10,000.00
	Income from bonds sold or matured				51,472.86
$8,378,000	*Total, Public Utility Bonds*			$8,202,446.24	$437,223.03

Shares				
	PUBLIC UTILITY STOCKS			
3,384	American Tel. & Tel.....	(9)	$390,081.92	$30,456.00
700	Brooklyn Union Gas.....	(5)	45,870.59	3,500.00
2,000	Cons. Gas, N. Y., Pfd.....	(5)	194,975.00	10,000.00
381	Edison Elec. Ill., Boston....	(8)	75,185.59	3,004.50
500	Memphis Pr. & Lt., Pfd....	(7)	49,375.00	3,500.00
1,500	Pub. Serv. of N. J., Pfd.....	(5)	148,665.88	7,500.00
500	Stone & Webster, Inc.....	..	27,680.74	.....
700	West Penn Pr., Pfd.....	(6)	68,130.58	4,080.00
	Income from stocks sold....			5,981.56
	Total, Public Utility Stocks..		$999,965.30	$68,022.06

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	RAILROAD BONDS				
$150,000	Albany & Susq., 1st .	3½s	1946	$105,000.00	$10,089.23
110,000	Atch.Top. & Santa Fe.	4s	1995	105,370.00	4,400.00
100,000	Atch.Top.& S.FeC&A	4½s	1962	99,956.25	3,790.62
50,000	Atlantic Coast Line .	4½s	1964	48,875.00	2,250.00
150,000	Boston & Maine, 1st .	5s	1955	150,570.00	7,500.00
50,000	Boston & Maine, 1st .	5s	1967	46,500.00	2,500.00
90,000	Canadian National..	4½s	1957	88,425.00	4,050.00
100,000	Canadian National..	4½s	1956	98,000.00	4,500.00
48,000	Can. Nat. Eq. Tr.H..	4½s	1935–37	40,440.00	2,160.00
50,000	Can. Nat. Eq. Tr. J..	4½s	1937–38	49,180.00	2,250.00
59.000	Canadian Pac. Eq.Tr.	5s	1944	59,763.00	2,950.00
75,000	Central New England 1st	4s	1961	56,281.25	3,000.00
50,000	Central Pacific.....	4s	1954	40,918.75	2,000.00
100,000	Chesapeake Corp....	5s	1944	104,013.00	1,307.91
100,000	Chic. Burl. & Quincy.	4s	1958	101,250.00	3,126.34
100,000	Chic. Burl. & Q., 1st..	4½s	1977	96,750.00	4,500.00
100,000	Chic.J.& Un.Stk.Yds.	4s	1940	94,250.00	4,000.00
75,000	Chic.J.& Un.Stk.Yds.	5s	1940	74,143.75	3,750.00
65,000	Chicago Un. Sta., 1st	4½s	1963	65,284.00	2,925.00
100,000	Chic. & Northwestern	4s	1987	96,500.00	4,000.00
200,000	Chic. & Northwest.1st	4½s	2037	189,500.00	9,000.00
85,000	Chic. & Northwestern	4¾s	1949	85,100.00	4,294.79
10,000	Chic.& Northw.Eq.Tr.	5s	1935–38	9,899.30	500.00
75,000	Cin. Un. Term., 1st..	5s	1957	77,167.00	3,750.00
100,000	Cl. Cin. Chi.& St. L. .	4½s	1977	98,891.25	4,500.00
100,000	Grand Tr.& W.Eq.Tr.	5s	1942	99,495.70	5,000.00
150,000	Great Northern.....	4½s	1976	144,344.25	6,750.00
100,000	Hudson & Manhattan	5s	1957	99,712.25	5,000.00
76,000	Illinois Cent. Eq. Tr..	4½s	1935–39	74,606.85	3,420.00
20,000	Illinois Cent. Eq. Tr..	5s	1936–37	19,650.00	1,000.00
75,000	Illinois Cent.....	4s	1952	67,875.00	3,000.00
68,000	Ill. Cent. Western 1st	4s	1951	62,817.50	2,720.00
50,000	Indianapolis Un.	5s	1965	49,468.75	2,500.00
50,000	Kans. City,Ft.S.& M.	4s	1936	41,243.75	.....
37,000	Kans. City, M. & B..	5s	1934	34,225.00	.....
8,500	Kans. City, M. & B..	4s	1934	8,287.50	.....
150,000	Kans. City Term., 1st	4s	1960	133,875.00	5,202.78
100,000	Long Island, Gen....	4s	1949	95,750.00	4,000.00
100,000	Long Island, Un.....	4s	1949	96,137.50	4,000.00
75,000	Me. Cent., 1st & Ref.	4½s	1935	73,500.00	3,375.00
100,000	Mo. Pac., 1st & Ref.F	5s	1977	99,750.00	.....
34,000	N. Y. Central, Eq.Tr.	4½s	1936–37	33,239.00	1,530.00

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	RAILROAD BONDS (*Continued*)				
$69,000	New York Central, B	6s	1944	$80,546.00	$4,140.00
100,000	N.Y.Chic.& St.L.,Ref	4½s	1978	97,000.00	4,500.00
100,000	N. Y. Connecting, 1st	4½s	1953	98,625.00	4,500.00
75,000	Northern Pacific....	4s	1997	67,875.00	3,000.00
482,000	Northern Pacific, Ref.	6s	2047	513,665.00	28,920.00
100,000	Oregon RR. & Nav...	4s	1946	99,410.83	3,675.78
*100,000	Pennsylvania.....	4½s	1960	117,388.00	*1,125.00*
100,000	Pennsylvania.....	4½s	1965	100,672.00	4,500.00
100,000	Pennsylvania.....	4½s	1970	87,497.34	3,421.24
125,000	Pere Marquette, 1st.	4½s	1980	120,987.50	5,625.00
117,900	Pere Marquette, 1st A	5s	1956	104,719.59	5,895.00
37,500	Pere Marquette, 1st.	4s	1956	37,500.00	1,500.00
51,000	Rio Grande West., 1st	4s	1939	49,935.00	2,040.00
5,000	St.L.,I.Mt.& S.(R&G)	4s	1933	4,812.50	300.00
83,000	St. L., Iron Mt. & So.	4s	1933	72,542.50	4,980.00
*100,000	Southern Pacific 1st.	4s	1955	95,250.00	*1,688.89*
212,000	Southern Pacific	4½s	1969	192,280.00	9,540.00
100,000	Southern Pac., 1st A.	4½s	1977	97,250.00	4,500.00
100,000	Term. R.R. of St.L 1st	4½s	1939	100,060.00	4,500.00
100,000	Term. R.R. of St. L..	4s	1953	83,860.00	4,000.00
100,000	Union Pacific, 1st ...	4s	1947	100,420.00	4,000.00
100,000	Union Pacific.....	4½s	1967	99,354.11	3,688.00
100,000	Un. Term., Dallas,1st.	5s	1942	99,673.75	5,000.00
200,000	Virginian, 1st A.....	5s	1962	191,737.50	10,000.00
75,000	Washington Term...	3½s	1945	68,196.37	2,625.00
	Income from bonds sold or matured				42,544.86
$6,317,900	*Total, Railroad Bonds*.....			$6,097,263.59	$309,172.66

*Items under Net Income shown in *italics* indicate accrued interest paid or excess expense over income.

Shares					
	RAILROAD STOCKS				
1,000	Atch. Top. & S. Fe, Pfd.....	(4.80)		$78,467.59	$3,340.00
1,500	Atch. Top. & S. Fe, Com....	(2)		209,328.30	3,000.00
2,000	Chesapeake & Ohio	(2.80)		91,626.25	4,200.00
1,032	Delaware & Hudson.....	....		126,604.00	....
1,150	Louisville & Nash.....	(2.50)		99,251.04	3,450.00
700	Norfolk & Western	(8.00)		99,785.56	4,080.00
2,000	Pennsylvania.....	(1)		144,023.13	2,000.00
1,000	Pere Marquette, Pr. Pref....			80,024.40	.....
650	Southern Pacific.....			58,500.00	.....
1,600	Union Pacific.....	(6)		213,674.30	9,600.00
	Income from stocks sold....				2,940.00
	Total, Railroad Stocks.....			$1,201,284.57	$32,610.00

Schedule H (*Continued*)

Par Value			*Book Value*	*Net Income*
	MISCELLANEOUS BONDS			
$100,000	Aldred Inv. Tr., deb.. 4½s	1967	$109,797.00	$4,500.00
371,000	Equit. Off. Bldg., deb. 5s	1952	371,000.00	19,150.00
200,000	Law.Mtg.Inv.Cor.,1st 5½s	1940	199,500.00	6,000.00
25,000	Steiger Bldg., 1st ... 5½s	1952	24,937.50	2,841.67
89,500	Trinity Bldg.N.Y.,1st 5½s	1939	86,533.33	4,922.50
	Income from bonds sold or matured			1,470.46
$785,500	*Total, Miscellaneous Bonds*		$791,767.83	$38,884.63

Shares				
	BANK, INSURANCE AND OTHER STOCKS			
588	Alaska Bldg. Trust.....	..	$58,251.22	.....
680	Boston R. E. Trust.....	(2)	71,661.64	$1,360.00
200	Discount Corp., N. Y.....	..	73,000.00	.....
521	First Boston Corp.....	(.50)	9,898.90	260.50
5,228	First Nat. Bk., Boston	(2)	319,001.96	10,426.00
40	First Nat. Bk., N. Y.	(100)	103,520.60	4,000.00
234	Guaranty Tr. Co., N. Y....	(8)	83,117.54	3,627.00
1,000	Hartford Fire Ins. Co.....	(2)	54,200.00	2,000.00
20	Methuen Nat. Bank.....	..	1,600.00	.....
1,000	National Fire Ins. Co.....	(2)	54,275.00	2,000.00
100	New England Trust Co.....	(30)	40,000.00	3,000.00
600	Old Colony Tr. Assoc.....	(.60)	30,000.00	360.00
1,000	Phoenix Ins. Co.....	(2½)	62,124.50	2,500.00
5,500	State St. Invest. Corp.....	(1.60)	400,235.00	8,800.00
25	Whittenton Pers. Prop. Co .	..	875.00	.....
	Total, Other Stocks.....		$1,361,761.36	$38,333.50

Schedule H (*Continued*)

Principal				*Book Value*	*Net Income*
	MORTGAGE NOTES				
$5,500	Adams	(5)	1937	$5,500.00	$137.50
6,000	Beta Nu House Corp	(5)		6,000.00	325.00
4,500	Bigelow	(5)		4,500.00	225.00
3,750	McKenzie	(5)	1938	3,750.00	194.38
60,000	Martin	(1)		60,000.00	600.00
5,000	Mass.Hosp.Life Ins.Co.	(3)		5,000.00	150.00
100,000	Old Colony Tr.,Trustee	(6)		100,000.00	6,000.00
2,400	Orlogski	(5)		2,400.00	120.00
12,500	Phi Beta Eps. Corp	(5)		12,500.00	662.50
13,000	Theta Chi	(5)		13,000.00	650.00
70,000	Walton Trust	(5)	1940	70,000.00	875.00
$282,650	*Total, Mortgage Notes*			$282,650.00	$9,939.38
	REAL ESTATE				
$205,632.55	Avon St., Boston			$205,632.55	$4,616.47
385,364.53	Franklin St., Boston			385,364.53	3,028.19
*40,392.40	Huntington Ave., Boston			40,392.40	*41.00*
*40,000.00	Memorial Drive, Cambridge			40,000.00	*1,463.06*
*100.00	Haven Ave., Mattapan			100.00	*96.46*
	*Expense on Real Estate sold				*611.66*
$671,489.48	*Total, Real Estate*			$671,489.48	$5,432.48

*Items under Net Income shown in *italics* indicate accrued interest paid or excess expense over income.

RECAPITULATION GENERAL INVESTMENTS

	%			
Government Bonds	6.6		$2,001,532.36	$102,446.24
Industrial Bonds	6.7	28.9	2,035,421.68	94,993.39
Industrial Stocks	22.2		6,713,201.26	303,618.50
Public Utility Bonds	27.0	30.3	8,202,446.24	437,223.03
Public Utility Stocks	3.3		999,965.30	68,022.06
Railroad Bonds	20.1	24.0	6,097,263.59	309,172.66
Railroad Stocks	3.9		1,201,284.57	32,610.00
Miscellaneous Bonds	2.6		791,767.83	38,884.63
Bank,Ins.& Other St.	4.5		1,361,761.36	38,333.50
Mortgage Notes	0.9		282,650.00	9,939.38
Real Estate	2.2		671,489.48	5,432.48
Total, General Investments	100%		$30,358,783.67	$1,440,675.87

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	INVESTMENTS, MALCOLM COTTON BROWN FUND				
$10,000	Met. West Side Elev.	4s	1938	$4,100.00	.....
15,000	Met. West Side El., 1st	4s	1938	6,750.00	.....
1,000	Pub. Serv. No. Ills., 1st	4½s	1980	990.00	$45.00
1,000	United States.....	3¼s	1945	1,052.00	.27
	Income from bonds sold				82.44
$27,000				$12,892.00	$127.71
Shares					
	INVESTMENTS, COFFIN MEMORIAL FUND				
350	Light & Pr. Sec. Co. Pfd.	(6)		$35,000.00	$2,100.00
10	Un. Gas & Imp., Pfd.	(5)		973.04	50.00
				$35,973.04	$2,150.00
Par Value					
	INVESTMENTS, DRAPER FUND				
$22,000	Ontario.....	5s	1959	$21,890.00	$1,109.63
4,000	Brooklyn Edison....	5s	1952	3,870.00	200.00
20,000	N. Y. Telephone, 1st.	4½s	1939	19,395.00	900.00
14,000	Ohio Power Co., 1st..	4½s	1956	12,202.50	630.00
5,000	Texas Pr. & Lt.....	5s	1937	5,167.00	133.33
5,000	Chic. Burl. & Quincy.	3½s	1949	5,012.00	35.00
24,000	Indianapolis Un. Ry.	5s	1965	23,880.00	1,200.00
	Income from bonds sold				128.33
$94,000				$91,416.50	$4,336.29
	INVESTMENTS, RICHARD LEE RUSSEL FUND				
$3,000	Trinity Bldg., N. Y..	5⅛s	1939	$3,000.00	$165.00
	INVESTMENTS, SUSAN H. SWETT FUND				
$10,000	Mass. Hosp. Life Ins. Co.	(3)		$10,000.00	$300.00
2,000	Trinity Bldg., N. Y..	5⅛s	1939	2,000.00	110.00
$12,000				$12,000.00	$410.00

Schedule H (*Continued*)

Par Value or Shares				*Book Value*	*Net Income*
	INVESTMENTS, WILLIAM LYMAN UNDERWOOD FUND				
$1,000	American Tel. & Tel..	5s	1960	$1,088.00	$17.78
1,000	Chic. Burl. & Quincy.	3½s	1949	1,007.00	12.44
600	United States of Am.	3¼s	1941	622.00	8.57
Shares					
34	Bos.W.H.& R., Com..	(.75)		2,992.00	25.50
20	Bos.W.H.& Rub.,Pfd.	(6)		2,000.00	120.00
40	Cons. Gas, N. Y.....	(1)		4,880.00	60.00
58	Ludlow Mfg. Assoc..	(6)		6,380.00	.....
				$18,969.00	$244.29
	INVESTMENTS, FRANCES E. WESTON FUND				
$10,000	Mtg.Note,A.C.Bartlett			$10,000.00	.....
	INVESTMENTS, JONATHAN WHITNEY FUND				
$54,000	Canada.....	4½s	1936	$53,257.50	$2,430.00
*10,000	United States of Am.	3¼s	1945	10,605.00	*20.76*
*20,000	Nat. Dairy Products.	5¼s	1948	20,820.00	*77.87*
24,000	Swift & Co., 1st.....	5s	1944	21,720.00	1,200.00
28,000	Western Elec., Deb..	5s	1944	27,720.00	1,400.00
27,000	Brooklyn Edison....	5s	1952	26,122.50	1,350.00
15,000	Cons. Gas., N. Y.....	4½s	1951	16,046.00	39.37
25,000	Detroit Edison.....	5s	1952	24,825.00	1,250.00
16,000	Memphis Pr.& Lt.,1st	5s	1948	15,040.00	800.00
25,000	N. Y. Telephone, 1st.	4½s	1939	24,150.39	1,125.00
9,000	Sierra & San F.Pr.,1st	5s	1949	8,077.50	450.00
25,000	A.T.& S.Fe., G &A 1st	4½s	1962	24,381.25	1,125.00
25,000	Chic. Burl. & Quincy.	3½s	1949	25,058.50	167.71
35,000	Chic. Union Sta., 1st.	4½s	1963	35,153.00	1,575.00
50,000	Kans. City Term., 1st	4s	1960	42,750.00	2,000.00
23,000	Long Island, Ref....	4s	1949	23,055.00	920.00
25,000	Maine Central, 1st..	4½s	1935	25,000.00	1,125.00
16,000	N. Y. Central, Eq.Tr.	4½s	1935–36	15,558.10	720.00
5,000	Penn., Eq. Tr. A	5s	1936	4,950.00	250.00
8,000	Union Pacific.....	4½s	1967	8,242.00	240.37
150,000	Mtge.Note MIT Dorm.	5s	....	150,000.00	7,500.00
	Income from bonds sold				3,047.77
$615,000				$602,531.74	$28,616.59

* Items under Net Income shown in *italics* indicate accrued interest paid or excess expense over income.

Schedule H (*Continued*)

Par Value or Shares				*Book Value*	*Net Income*
	INVESTMENTS, EDWIN A. WYETH FUND				
$10,000	Atlantic Refining ...	5s	1937	$10,350.00	.....
15,000	Western Elec., deb...	5s	1944	15,534.00	$375.00
55	American Can.....	(4)		6,346.81	55.00
250	General Motors.....	(1)		8,500.00	125.00
250	Pullman.....	(3)		11,750.00	375.00
100	Un. Carb. & Carbon.	(1.60)		4,640.00	.....
$10,000	Carolina Pr. & Light.	5s	1956	8,300.00	250.00
5,000	Columbia Gas & Elec.	5s	1952	4,100.00	125.00
5,000	Cons. Gas, N. Y.....	4½s	1951	5,328.00	22.50
10,000	Gulf States Util., 1st.	5s	1956	9,300.00	250.00
15,000	Miss. River Pr., 1st..	5s	1951	15,844.00	.....
10,000	N. Y. Edison, 1st....	5s	1951	10,753.00	250.00
10,000	Pacific Gas & Elec., 1st	4½s	1957	10,095.00	225.00
15,000	Southern Cal. Edison.	5s	1939	15,960.00	.....
10,000	Texas Power & Light.	5s	1937	10,150.00	250.00
200	American Tel. & Tel..	(9)		21,000.00	1,350.00
$15,000	Baltimore & Ohio, 1st	4s	1948	15,279.00	300.00
5,000	Canadian Pac. Eq.Tr.	5s	1944	5,405.00	.....
15,000	Chic. Burl. & Quincy	3½s	1949	15,280.00	.....
10,000	Kans. City Term., 1st	4s	1960	10,480.00	.....
15,000	Long Island R.R.,Ref.	4s	1949	15,420.00	300.00
5,000	Pennsylvania Eq. Tr.	5s	1937	5,085.00	125.00
2,500	Southern Pacific	4s	1949	1,750.00	50.00
10,000	Union Pacific, 1st ...	4s	1947	10,739.00	.....
	Income from items sold				196.00
				$247,388.81	$4,623.50
	Grand Totals, All Investments			$31,392,954.76	$1,481,349.25

SCHEDULE J

EDUCATIONAL PLANT

Land, Buildings and Equipment

Land, Boylston, Clarendon and Newbury Streets, Boston	$1,500,000.00
Rogers Building, Boylston Street, Boston	204,534.76
Walker Building, Boylston Street, Boston	150,000.00
Land, east of Massachusetts Avenue, Cambridge	1,125,766.67
Land, west of Massachusetts Avenue	850,014.82
Main Educational Building Group	4,071,492.13
George Eastman Research Laboratories	1,225,098.58
Pratt School of Naval Architecture	674,971.70
Guggenheim Aeronautical Laboratory	293,637.46
Aeronautical Engine Testing Laboratory	121,101.92
Mechanic Arts Building	83,658.89
Power Plant (including Machinery and Equipment)	302,569.27
Homberg Memorial Infirmary	188,441.60
Educational Equipment, Cambridge	2,039,953.60
Steam and Electrical Distribution System, Cambridge	159,448.64
Gas Engine Laboratory	26,301.88
Hydraulic Laboratory	11,000.00
Compression Laboratory	31,000.00
Tractor Garage	6,400.00
Service Garage	5,981.54
Barbour Field House	55,000.00
Walker Memorial Building	575,111.50
Walker Memorial Building, Equipment	139,475.52
Dormitories (1916) ($331,357.67 less mortgage $150,000)	181,357.67
Dormitories (1916) Equipment	26,967.85
Alumni Dormitories (1924)	185,718.91
Alumni Dormitories (1924) Equipment	9,518.04
Alumni Dormitories (1928)	291,274.49
Alumni Dormitories (1928) Equipment	18,971.05
Alumni Dormitories (1930)	562,485.62
Alumni Dormitories (1930) Equipment	32,630.16
Service Building	42,988.20
Boathouse	54,244.13
Squash Courts	29,042.54
Summer Camp, East Machias, Maine	120,558.00
Summer Camp, Dover, New Jersey	35,000.00
Miscellaneous	301,726.27
Total, June 29, 1935 (Schedule D)	$15,733,443.41

SCHEDULE K

PRINCIPAL GIFTS AND APPROPRIATIONS FOR EDUCATIONAL PLANT

George Eastman, for New Buildings	$4,724,098.58
Maria A. Evans, for Dormitories	161,192.55
Class of 1893, for Dormitory	100,000.00
Appropriation, Maria A. Evans Fund	169,080.60
T. C. du Pont, for Land	625,000.00
T. C. du Pont, for Dormitories	100,000.00
T. C. and P. S. du Pont, Charles Hayden, for Mining Building	215,000.00
Pratt Fund, for School of Naval Architecture	675,150.00
Alumni Fund, Equipment, Dormitories and Walker Memorial	622,119.38
Alumni Dormitory Fund	516,945.66
Appropriation, E. D. Barbour Fund, for Dormitories	258,599.40
Appropriation, K. F. Wood Fund, for Dormitories	28,750.00
Appropriation, F. S. Hodges Fund, for Dormitories	57,316.26
Appropriation, Russell Robb Fund, for Dormitories	28,750.00
Appropriation, S. H. Thorndike Fund, for Dormitories	15,000.00
Walker Memorial Fund, for Walker Memorial	167,303.96
Appropriation of Emma Rogers Fund, for Equipment	528,077.06
Daniel Guggenheim Fund, for Aeronautical Laboratory	230,000.00
Estate of F. W. Emery, for Equipment	126,423.80
Appropriation of Charles C. Drew Fund	305,171.52
Subscriptions to Homberg Memorial Infirmary	110,225.00
Appropriation, E. D. Barbour Fund, for Field House	55,000.00
A. P. Sloan, Jr., for Aero Engine Laboratory	65,000.00
Appropriation of Frank E. Peabody Fund	52,238.89
Appropriation of French Fund, for Equipment	100,843.34
Appropriation of George B. Dorr Fund, for Equipment	49,573.47
Land in Boston, Grant of Commonwealth (estimated)	1,500,000.00
Appropriation of A. F. Estabrook Fund, for Land	85,000.00
Appropriation of Ida F. Estabrook Fund, for Land	20,000.00
Appropriation of Miscel. Unrestricted Funds, for Land	151,697.89
Subscriptions, for Land	125,525.00
Sale of Land and Buildings in Boston	656,919.45
Equipment from Buildings in Boston (estimated)	500,000.00
Other Funds, Donations, Appropriations, etc	2,607,441.60
Total, June 29, 1935 (Schedule D)	$15,733,443.41

SCHEDULE M
[1]ENDOWMENT FUNDS FOR GENERAL PURPOSES

No.	Restricted Funds	Funds, June 30, 1934	Investment Income	Other Income	Expended or Transferred	Funds, June 29, 1935
101	George Robert Armstrong	$5,000.00	$236.85	$2.37	$239.22	$5,000.00
102	George Blackburn Mem.	905,830.96	42,917.22	719.89	43,629.86	905,838.21
103	Charles Choate	35,858.15	1,705.32	17.09	1,722.41	35,858.15
104	Eben S. Draper	91,577.71	4,336.29	.....	50.62	95,863.38
105	Coleman du Pont	134,620.56	7,105.50	24,380.83	7,166.94	158,939.95
107	Eastman Contract	9,498,869.55	449,967.63	4,509.52	454,477.15	9,498,869.55
108	George Eastman (Building)	1,275,901.42	60,444.12	605.48	61,049.60	1,275,901.42
109	Charles W. Eaton	243,337.03	11,510.91	116.64	11,627.55	243,337.03
112	Educational Endowment	7,573,614.60	358,780.38	3,685.52	362,375.90	7,573,704.60
113	Martha Ann Edwards	30,000.00	1,421.10	14.24	1,435.34	30,000.00
114	William Endicott	25,000.00	1,184.25	11.87	1,196.12	25,000.00
117	Francis Appleton Foster.	1,000,000.00	47,370.00	475.00	47,845.00	1,000,000.00
118	Alexis H. French	5,000.00	236.85	2.37	239.22	5,000.00
119	Jonathan French	25,212.48	1,184.25	11.87	1,196.12	25,212.48
121	Henry C. Frick	1,827,443.19	86,592.36	1,435.19	87,459.80	1,828,010.94
122	General Endowment	1,527,449.00	72,333.99	724.96	73,058.95	1,527,449.00
123	James Fund	163,654.21	7,768.68	78.72	7,847.40	163,654.21
125	Katherine B. Lowell	5,000.00	236.85	2.37	239.22	5,000.00
126	Thomas McCammon	15,000.00	710.55	7.12	717.67	15,000.00
127	M. I. T. Alumni (Fund Bal.)	1,745.16	94.74	.76	.....	1,840.66
128	Kate M. Morse	25,000.00	1,184.25	11.87	1,196.12	25,000.00
129	Everett Morss	25,000.00	1,184.25	.....	1,184.25	25,000.00
131	Richard Perkins	50,000.00	2,368.50	23.74	2,392.24	50,000.00
132	J. W. and B. L. Randall.	83,452.36	3,931.71	39.84	3,971.55	83,452.36
135	Wm. Barton Rogers Mem.	250,225.00	11,842.50	116.70	11,959.20	250,225.00
136	[2]Saltonstall Fund	59,245.97	2,794.83	28.01	2,124.14	59,944.67
137	Samuel E. Sawyer	4,764.40	236.85	2.37	239.22	4,764.40
139	Andrew Hastings Spring.	50,000.00	2,368.50	23.74	2,392.24	50,000.00
140	Seth K. Sweetser	25,061.62	1,184.25	11.87	1,196.12	25,061.62
141	William J. Walker	23,613.59	1,136.88	11.39	1,148.27	23,613.59
114	Horace Herbert Watson	34,076.69	1,610.58	16.14	1,626.72	34,076.69
145	Albion K. P. Welch	5,000.00	236.85	2.37	239.22	5,000.00
146	Everett Westcott	.....	473.70	122,794.00	473.70	122,794.00
147	[3]George Wigglesworth	25,292.15	1,184.25	11.87	1,077.69	25,410.58
148	Edwin A. Wyeth	.....	4,623.50	269,665.64	26,244.93	248,044.21
		$25,050,845.80	$1,192,499.24	$429,561.36	$1,221,039.70	$25,451,866.70
	Unrestricted Funds					
151	Edmund D. Barbour	$332,021.42	$13,026.75	$157.36	$148,184.11	$197,021.42
153	Henrietta G. Fitz.	10,000.00	473.70	4.75	478.45	10,000.00
155	James W. Henry	.....	284.22	8,226.08	284.22	8,226.08
157	Industrial Fund	75,778.77	3,315.90	1,534.01	3,620.83	77,007.85
158	Hiram H. Logan	17,000.00	805.29	7.12	812.41	17,000.00
159	Hiram F. Mills	10,175.00	473.70	4.75	478.45	10,175.00

[1] See alphabetical listing and description of Funds on pages 162–172.
[2] One-fourth of net income added to Fund.
[3] Ten per cent of gross income added to Fund.

Schedule M (*Continued*)

	Unrestricted Funds (Continued)	*Funds, June 30, 1934*	*Investment Income*	*Other Income*	*Expended or Transferred*	*Funds, June 29, 1935*
161	Moses W. Oliver	$11,220.49	$521.07	$5.22	$526.29	$11,220.49
162	Emerette O. Patch	.....	.....	7,500.00	.....	7,500.00
163	Preston Player	20,000.00	947.40	9.50	956.90	20,000.00
165	Robert E. Rogers	7,680.77	378.96	3.80	382.76	7,680.77
168	Ellen V. Smith	25,000.00	1,184.25	11.87	1,196.12	25,000.00
173	Frank G. Webster	25,000.00	1,184.25	11.87	1,196.12	25,000.00
		$533,876.45	$22,595.49	$17,476.33	$158,116.66	$415,831.61

SCHEDULE M
[2]ENDOWMENT FUNDS FOR DESIGNATED PURPOSES

	Special Deposit Funds					
205	Endowment Reserve	$526,338.35	$24.09	$471,798.65	$864,226.95	$133,934.14
206	Endowment Reserve Income	14,420.06	.....	.....	14,420.06	.....
207	Albert Fund	2,239.70	47.37	1.42	2,031.50	256.99
208	[1]Alpha Chi Sigma House Fund	.....	47.37	2,340.96	.....	2,388.33
209	[1]Anonymous (1924)	1,733.07	94.74	.76	.....	1,828.57
210	[1]1923 Endowment	13,633.81	663.18	710.19	290.48	14,716.70
212	[1]1924 Endowment	12,990.55	615.81	1,934.31	205.38	15,335.29
214	[1]1925 Endowment	7,996.58	378.96	1,553.61	233.00	9,696.15
216	[1]1926 Endowment Special	266.89	63.73	.....	.....	330.62
217	[1]1926 Endowment	*365.48	.....	302.40	17.30	*80.38
218	[1]1927 Endowment	7,794.98	378.96	831.44	.....	9,005.38
220	[1]1928 Endowment	10,552.81	521.07	1,192.83	.....	12,266.71
221	[1]1929 Endowment	5,516.84	284.22	794.06	.....	6,595.12
222	[1]1930 Endowment	728.39	47.37	173.82	.....	949.58
223	[1]1934 Endowment	225.00	.....	.....	.....	225.00
224	[1]1935 Endowment	.....	.....	300.00	.....	300.00
225	M.I.T.Teachers' Insurance	4,153.16	.....	26,565.24	26,966.56	3,751.84
226	[1]M.I.T.Teachers' Insurance (Special)	58,738.82	2,747.46	3,066.98	3,383.28	61,169.98
227	[1]M.I.T.Alumni Association Permanent Funds	51,800.57	2,463.24	248.74	.....	54,512.55
228	[1]Louisville Technology Foundation Fund.	.....	.....	50.00	.....	50.00
229	[1]Class of '98 Loan	†6,918.10	331.59	3.13	.....	7,252.82
230	[1]Class of '74	180.97	.....	.....	.....	180.97
231	Professors' Fund	29,071.13	947.40	342.74	17,250.00	13,111.27
233	[1]Richards Portrait	590.43	23.69	.....	.....	614.12
235	Rockefeller Found. Research	77.00	.....	24,999.96	25,195.00	*118.04
236	[1]W. P. Ryan Special	3,135.90	142.11	1.42	.....	3,279.43
237	Sedgwick Memorial Lecture Fund	7,326.58	331.59	503.51	293.51	7,868.17
238	[1]W. B. S. Thomas Fund	.....	.....	928.58	.....	928.58
239	[1]Elihu Thomson	6,477.56	284.22	2.85	.....	6,764.63
240	[1]Undergraduate Activities Trust	.....	.....	1,097.26	.....	1,097.26
243	[1]Undergraduate Dues, Res. Athletics	11,577.27	521.07	5.22	1,088.88	11,014.68
244	[1]Undergraduate Dues, Res. Contingent	12,042.63	568.44	1,005.22	.....	13,616.29
		$796,161.67	$11,527.68	$540,755.30	$955,601.90	$392,842.75

[1] Income added to Fund.
* Overdraft.

[2] See alphabetical listing and description of Funds on pages 162–172.
† Exclusive of student notes receivable. (See Schedule P, page 156.)

[2]Schedule M (*Continued*)

No.		*Funds, June 30, 1934*	*Investment Income*	*Other Income*	*Expended or Transferred*	*Funds, June 29, 1935*
	Funds for Salaries					
251	Samuel C. Cobb For General Salaries	$36,551.31	$1,705.32	$17.56	$1,722.88	$36,551.31
253	Sarah H. Forbes For General Salaries	500.00	23.69	.....	23.69	500.00
255	George A. Gardner For General Salaries	20,000 00	947.40	9.50	956.90	20,000.00
259	James Hayward Professorship of Engineering.	18,800.00	900.03	9.02	909.05	18,800.00
261	William P. Mason Professorship of Geology . .	18,800.00	900.03	9.02	909.05	18,800.00
263	Henry B. Rogers For General Salaries	25,000.00	1,184.25	11.87	1,196.12	25,000.00
265	Nathaniel Thayer Professorship of Physics . .	25,000.00	1,184.25	11.87	1,196.12	25,000.00
266	Elihu Thomson Professorship, Elec. Eng. . .	6,239.60	284.22	2.61	286.83	6,239.60
		$150,890.91	$7,129.19	$71.45	$7,200.64	$150,890.91
	Funds for Library, Reading Rooms and Gymnasium					
271	Walter S. Barker	$10,637.44	$473.70	$5.22	$334.10	$10,782.26
273	Ednah Dow Cheney	15,271.71	710.55	7.60	1,546.42	14,443.44
274	Frank Harvey Cilley	83,799.58	3,979.08	39.36	3,690.75	84,127.27
277	Charles Lewis Flint	5,431.84	236.85	2.37	205.87	5,465.19
280	William Hall Kerr	3,308.89	142.11	1.42	15.03	3,437.39
283	George A. Osborne	9,711.38	473.70	4.27	359.33	9,830.02
286	Arthur Rotch, Architectural . .	6,693.26	331.59	3.32	409.63	6,618.54
288	Technology Matrons' Teas . .	9,161.32	426.33	4.27	411.97	9,179.95
289	John Hume Tod	2,938.26	142.11	1.42	74.27	3,007.52
291	Theodore N. Vail	39,851.39	1,894.80	18.99	1,600.00	40,165.18
		$186,805.07	$8,810.82	$88.24	$8,647.37	$187,056.76
	Funds for Departments					
301	William Parsons Atkinson . . .	$13,082.20	$615.81	$6.17	$621.98	$13,082.20
303	Frank Walter Boles Memorial .	28,577.12	1,326.36	13.29	322.19	29,594.58
305	William E. Chamberlain . . .	7,309.77	331.59	3.32	334.91	7,309.77
307	Chemical Engineering Practice	257,772.97	12,221.46	123.84	12,345.30	257,772.97
309	Crosby Honorary Fund	1,713.28	94.74	.76	36.66	1,772.12
311	Susan E. Dorr	95,955.67	4,547.52	46.08	4,593.60	95,955.67
312	George Eastman	400,000.00	18,948.00	187.20	19,135.20	400,000.00
316	John Lawrence Mauran	10,000.00	473.70	1.42	475.12	10,000.00
317	George Henry May	5,000.00	236.85	2.37	239.22	5,000.00
319	Susan Minns	40,000.00	.....	.....	.....	40,000.00
320	Forris Jewett Moore	30,255.47	1,421.10	13.77	150.51	31,539.83
322	William E. Nickerson	26,982.66	1,278.99	13.77	5,435.36	22,840.06
324	Edward D. Peters	5,887.82	284.22	2.85	250.00	5,924.89
325	Pratt Naval Architectural . .	392,399.95	18,569.04	186.16	18,755.20	392,399.95
327	Arthur Rotch	25,000.00	1,184.25	11.87	1,196.12	25,000.00
329	W. T. Sedgwick	92,614.51	4,121.19	43.68	6,979.97	89,799.41
331	[1]Edmund K. Turner	249,817.06	11,842.50	119.52	9,518.37	252,260.71
333	William Lyman Underwood . .	12,625.00	244.29	6,380.00	10.07	19,239.22
		$1,694,993.48	$77,741.61	$7,156.07	$80,399.78	$1,699,491.38

[1]One-fourth of net income added to Fund.

[2] See alphabetical listing and description of Funds on pages 162–172.

[1]Schedule M (*Continued*)

No.		Funds, June 30, 1934	Investment Income	Other Income	Expended or Transferred	Funds, June 29 1935
	FUNDS FOR RESEARCH					
343	Samuel Cabot	$53,458.61	$2,463.24	$24.22	$1,937.96	$54,008.11
344	Crane Automotive Research	5,105.59	236.85	2.37	.....	5,344.81
349	Ellen H. Richards	21,102.56	994.77	9.97	665.00	21,442.30
351	Charlotte B. Richardson	46,833.33	2,226.39	21.36	3,080.00	46,001.08
356	Textile Research Fund	18,408.04	473.70	10.92	13,527.60	5,365.06
358	Edward Whitney	50,051.95	1,894.80	25.64	12,610.00	39,362.39
		$194,960.08	$8,289.75	$94.48	$31,820.56	$171,523.75
	FUNDS FOR FELLOWSHIPS					
361	Arkwright Club	$969.41	.....	$30.59	$1,000.00	.....
363	William Sumner Bolles	27,291.59	$1,278.99	12.82	1,100.00	$27,483.40
364	Malcolm Cotton Brown	12,990.34	127.71	.....	941.48	12,176.57
366	Collamore	14,344.91	663.18	6.65	600.00	14,414.74
368	Dalton Graduate Chemical	7,408.66	331.59	3.32	300.00	7,443.57
374	Rebecca R. Joslin	†2,629.78	142.11	1.19	.....	2,773.08
376	Wilfred Lewis	5,265.30	236.85	2.37	200.00	5,304.52
378	Moore	29,375.16	1,373.73	13.77	1,500.00	29,262.66
380	Willard B. Perkins	7,802.54	284.22	3.32	1,500.00	6,590.08
382	Proctor	.....	.....	3,000.00	1,500.00	1,500.00
384	Proprietors Locks and Canals	3,560.52	189.48	1.42	.....	3,751.42
386	Henry Bromfield Rogers	25,669.91	1,231.62	11.87	1,500.00	25,413.40
388	Richard Lee Russel	3,354.07	165.00	.....	141.50	3,377.57
390	Henry Saltonstall	10,926.85	521.07	5.22	500.00	10,953.14
392	James Savage	12,279.72	568.44	5.70	500.00	12,353.86
393	Sloan	*1,000.00	.....	2,000.00	1,000.00	.....
395	Susan H. Swett	12,110.45	410.00	.....	500.00	12,020.45
396	Gerard Swope	138.75	.....	.....	.....	138.75
397	Frank Hall Thorp	10,562.99	473.70	5.22	400.00	10,641.91
398	Louis Francisco Verges	10,582.90	473.70	5.22	500.00	10,561.82
		$196,263.85	$8,471.39	$5,108.68	$13,682.98	$196,160.94
	FUNDS FOR SCHOLARSHIPS					
401	Elisha Atkins	$5,256.47	$236.85	$2.37	$250.00	$5,245.69
403	Billings Student	51,029.54	2,415.87	24.22	2,149.00	51,320.63
404	Jonathan Bourne	10,801.46	521.07	5.22	450.00	10,877.75
405	Albert G. Boyden	575,564.62	27,285.12	382.00	24,082.45	579,149.29
406	Harriet L. Brown	7,517.64	378.96	3.80	300.00	7,600.40
408	Nino Tesher Catlin	1,048.94	47.37	.48	50.00	1,046.79
411	Lucius Clapp	5,133.47	236.85	2.37	200.00	5,172.69
413	Class of 1896	6,085.55	284.22	2.85	250.00	6,122.62
415	Lucretia Crocker	77,241.26	3,647.49	36.56	2,950.00	77,975.31
417	Isaac W. Danforth	5,378.91	236.85	2.37	200.00	5,418.13

[1] See alphabetical listing and description of Funds on pages 162–172.
* Overdraft.
† Exclusive of student notes receivable. (See Schedule P, page 156.)

[1]Schedule M (*Continued*)

No.		Funds, June 30, 1934	Investment Income	Other Income	Expended or Transferred	Funds, June 29, 1935
420	Ann White Dickinson	$42,096.43	$1,989.54	$19.94	$1,750.00	$42,355.91
421	Thomas M. Drown	52,349.79	2,463.24	24.69	2,050.00	52,787.72
424	Farnsworth	5,536.14	284.22	2.37	200.00	5,622.73
426	Charles Lewis Flint	5,569.46	284.22	2.85	225.00	5,631.53
427	Sarah S. Forbes	3,709.59	189.48	1.90	150.00	3,750.97
429	Fuel and Gas Scholarship	350.00	.....	.....	.....	350.00
431	George Hollingsworth	5,179.23	236.85	2.37	200.00	5,218.45
433	T. Sterry Hunt	3,277.52	142.11	1.42	150.00	3,271.05
434	William F. Huntington	5,362.92	236.85	2.37	225.00	5,377.14
436	Joy Scholarships	17,377.71	805.29	8.07	650.00	17,541.07
438	William Litchfield	5,447.18	236.85	2.37	200.00	5,486.40
439	Elisha T. Loring	5,456.97	236.85	2.37	200.00	5,496.19
441	Lowell Institute Scholarship	2,683.35	142.11	1.42	100.00	2,726.88
442	Rupert A. Marden	2,045.30	94.74	.48	80.00	2,060.52
443	George Henry May	†7,857.39	378.96	421.59	300.00	8,357.94
445	James H. Mirrlees	2,676.50	142.11	1.42	100.00	2,720.03
447	Nichols Scholarship	5,702.65	284.22	2.37	500.00	5,489.24
448	Charles C. Nichols	5,447.47	236.85	2.37	200.00	5,486.69
450	John Felt Osgood	5,346.50	236.85	2.37	225.00	5,360.72
451	George L. Parmelee	18,812.71	900.03	9.02	775.00	18,946.76
453	Richard Perkins	53,641.67	2,557.98	25.64	2,250.00	53,975.29
454	Thomas Adelbert Read	.....	426.33	21,117.00	.....	21,543.33
454a	William P. Ryan Memorial	.....	80.53	3,557.42	.....	3,637.95
455	John P. Schenkl	46,540.73	2,226.39	21.36	1,860.00	46,928.48
456	Thomas Sherwin	5,445.13	236.85	2.37	225.00	5,459.35
458	Horace T. Smith	33,554.13	1,610.58	15.67	1,300.00	33,880.38
459	Sons and Daughters New England Colony	626.72	28.42	.....	25.00	630.14
460	Samuel E. Tinkham	2,463.23	94.74	1.42	100.00	2,459.39
462	F. B. Tough	†35.30	.....	211.82	.....	247.12
463	Susan Upham	1,188.48	47.37	.48	50.00	1,186.33
465	Vermont Scholarship	8,207.33	521.07	10,003.80	500.00	18,232.20
467	Ann White Vose	62,032.39	2,936.94	29.44	2,600.00	62,398.77
469	Arthur M. Waitt	10,379.44	473.70	4.75	450.00	10,407.89
471	Louis Weissbein	4,357.63	189.48	1.90	200.00	4,349.01
473	Frances Erving Weston	6,524.28	71.06	.....	200.00	6,395.34
474	Samuel Martin Weston	5,422.54	.....	.....	200.00	5,222.54
476	Amasa J. Whiting	4,778.31	236.85	2.37	200.00	4,817.53
477	Elizabeth Babcock Willmann	.....	.....	5,065.51	.....	5,065.51
		$1,192,539.98	$56,550.31	$41,034.95	$49,321.45	$1,240,803.79
	FUNDS FOR PRIZES					
481	Robert A. Boit	$5,187.37	$236.85	$2.37	$240.00	$5,186.59
483	Class of 1904	573.10	23.69	.....	10.00	586.79
485	Roger Defriez Hunneman	1,022.44	47.37	.48	50.00	1,020.29
487	James Means	3,232.50	142.11	1.42	131.90	3,244.13
489	Arthur Rotch	6,969.90	331.59	3.32	200.00	7,104.81
491	Arthur Rotch, Special	9,355.90	426.33	4.75	.....	9,786.98
493	Samuel W. Stratton	1,796.51	94.74	.95	111.50	1,780.70
		$28,137.72	$1,302.68	$13.29	$743.40	$28,710.29

[1] See alphabetical listing and description of Funds on pages 162–172
† Exclusive of student notes receivable. (See Schedule P, page 156.)

[2]Schedule M (*Continued*)

No.	Funds for Relief	*Funds, June 30, 1934*	*Investment Income*	*Other Income*	*Expended or Transferred*	*Funds, June 29, 1935*
501	Edward Austin	$436,337.28	$20,653.32	$456.76	$18,000.00	$439,447.36
503	Thomas Wendell Bailey	2,633.28	142.11	1.42	100.00	2,676.81
504	[1]Charles Tidd Baker	28,945.23	1,373.73	13.29	550.00	29,782.25
506	Levi Boles	10,946.63	521.07	5.22	450.00	11,022.92
508	Bursar's Fund	†9,085.61	450.02	2,751.65	2,428.16	9,859.12
510	Mabel Blake Case	26,819.79	1,278.99	12.82	1,100.00	27,011.60
511	Chandler	3,926.65	189.48	1.90	.....	4,118.03
512	Fred L. and Florence L. Coburn	5,116.64	236.85	2.37	200.00	5,155.86
514	Coffin Memorial	41,987.50	2,150.00	.....	2,100.00	42,037.50
516	Dean's Fund	†3,925.89	213.17	842.17	86.97	4,894.26
518	Carl P. Dennett	†581.21	28.42	110.77	.....	720.40
520	Dormitory Fund	3,924.46	189.48	25.00	150.00	3,988.94
521	Frances and William Emerson	†100,763.60	4,784.37	47.50	4,275.00	101,320.47
523	Norman H. George	93,572.25	4,452.78	44.64	3,750.00	94,319.67
525	John A. Grimmons	†10,412.46	355.28	2,752.30	4,722.84	8,797.20
527	James H. Haste	177,645.43	8,431.86	1,763.02	7,005.00	180,835.31
529	David L. Jewell	25,881.68	1,231.62	12.34	1,000.00	26,125.64
531	William B. Rogers	†23,856.12	1,231.62	5,288.70	2,693.75	27,682.69
532	Summer Surveying Camp	†1,138.10	47.37	478.94	100.00	1,564.41
534	Teachers' Fund	134,717.08	6,394.95	64.32	3,825.00	137,351.35
536	Samson R. Urbino	1,065.94	47.37	.48	40.00	1,073.79
537	Jonathan Whitney	607,982.96	28,616.59	812.50	36,946.69	600,465.36
539	Morrill Wyman	71,774.91	3,410.64	34.56	3,000.00	72,220.11
		$1,823,040.70	$86,431.09	$15,522.67	$92,523.41	$1,832,471.05

Recapitulation of Funds

FOR GENERAL PURPOSES					
Restricted	$25,050,845.80	$1,192,499.24	$429,561.36	$1,221,039.70	$25,451,866.70
Unrestricted	533,876.45	22,595.49	17,476.33	158,116.66	415,831.61
FOR DESIGNATED PURPOSES					
Special Deposit Funds	796,161.67	11,527.68	540,755.30	955,601.90	392,842.75
Salaries	150,890.91	7,129.19	71.45	7,200.64	150,890.91
Libraries, etc.	186,805.07	8,810.82	88.24	8,647.37	187,056.76
Departments	1,694,993.48	77,741.61	7,156.07	80,399.78	1,699,491.38
Research	194,960.08	8,289.75	94.48	31,820.56	171,523.75
Fellowships	196,263.85	8,471.39	5,108.68	13,682.98	196,160.94
Scholarships	1,192,539.98	56,550.31	41,034.95	49,321.45	1,240,803.79
Prizes	28,137.72	1,302.68	13.29	743.40	28,710.29
Relief	1,823,040.70	86,431.09	15,522.67	92,523.41	1,832,471.05
Total (Schedule D)	$31,848,515.71	$1,481,349.25 (Schedule B)	$1,056,882.82	$2,619,097.85	$31,767,649.93 (Schedule D)

[1]One-half of the income added to the principal.
[2]See alphabetical listing and description of Funds on pages 162–172.
† Exclusive of student notes receivable. (See Schedule P, page 156.)

SCHEDULE P

STUDENT NOTES RECEIVABLE

Fund	*Notes Receivable June 30, 1934*	*Loans Made 1934–1935*	*Loans Repaid 1934–1935*	*Notes Receivable June 29, 1935*	*Interest Received 1934–1935*
Technology Loan Fund . .	$586,260.79	$152,656.75*	$59,585.48	$679,332.06	$13,497.30
Bursar's Fund	13,289.55	2,428.16	2,438.46	13,279.25	308.92
Rogers Fund	15,508.34	2,693.75	4,607.35	13,594.74	670.43
Dean's Fund	2,801.08	86.97	777.52	2,110.53	62.75
C. E. Summer Camp Fund .	665.00	100.00	454.00	311.00	24.94
Grimmons Sch. Loan Fund .	2,210.00	150.00	425.00	1,935.00	59.44
Dennett Fund	760.00	.....	95.00	665.00	15.77
Dean's Special Fund . . .	95.00	.....	95.00	.....	.....
G. H. May Sch. Fund . . .	2,708.75	300.00	417.79	2,590.96	.....
F. B. Tough Fund.	500.00	.....	200.00	300.00	11.82
Hygiene Special Fund . . .	2,405.23	1,514.80	130.45	3,789.58	.17
Class of 1898 Fund	500.00	.....	.....	500.00	.....
Emerson Fund	600.00	.....	.....	600.00	.....
Austin Fund	250.00	.....	250.00	.....	.....
C. W. Eaton Fund	600.00	.....	.....	600.00	.....
Total	$629,153.74	$159,930.43	$69,476.05	$719,608.12	$14,651.54
	Schedule D				

* Includes $200 written off — deceased borrower.

SCHEDULE R

CURRENT FUNDS

Name	Balance June 30, 1934	Income	Other Increases	Salaries and Expenses	Balance June 29, 1935
Additional Group Ins. Fund	$23.00	$5,280.13	.....	$5,270.00	$33.13
Aeronautical Engineering					
Balloon Fund	10.00	.....	.....	.....	10.00
Design	*138.77	100.00	.....	.....	*38.77
Summer Shop Course	.....	.....	[2]$150.00	50.00	100.00
Wind Tunnels	2,374.89	3,328.50	.....	688.97	5,014.42
Wing Flutter Acct.	115.64	.....	.....	.....	115.64
No. 640	1,954.08	.....	.....	19.08	1,935.00
No. 868	64.02	.....	.....	64.02	.....
No. 881	*2,450.33	4,566.00	[2]72.88	2,188.55	.....
No. 915	*247.97	.....	[2]262.36	14.39	.....
No. 927	252.23	.....	.....	252.23	.....
No. 1014	300.00	.....	.....	300.00	.....
No. 1015	972.08	30.00	.....	928.20	73.88
No. 1088	.....	.....	[1]500.00	334.00	166.00
Aldred Lecture Fund	*619.44	619.44	.....	.....	.....
Alumni Day 1935	.....	3,836.00	.....	3,836.00	.....
American Assoc. for the Advancement of Science — Pittsburgh Meeting	750.00	.....	.....	600.00	150.00
Architecture:					
Travel. Scholarship	.....	.....	[2]1,500.00	1,500.00	.....
Biology — Food Research	3,210.40	.....	[1]1,200.00	1,924.31	2,486.09
Ayer Company Research	.....	1,500.00	.....	2,099.11	*599.11
Biocinema Research	1,670.57	.....	.....	.....	1,670.57
Coffee Research	521.46	.....	.....	521.46	.....
Health Education	305.36	10.00	[1]1,500.00	1,236.00	579.36
Special Research	9,912.29	900.00	[2]528.48	4,556.19	6,784.58
Radiations Account	.....	.....	[2]636.81	636.81	.....
Rockefeller Research	2,768.49	.....	[2]3,700.00	6,637.58	*169.09
Blue Print Service	49.58	.....	.....	49.58	.....
Boat House Equipment	1,450.06	270.40	.....	483.94	1,236.52
Building Key Account	2,708.65	1,000.50	.....	892.31	2,816.84
Bus. and Eng. Administration:					
Graduate Fellowship Fund	378.44	170.00	.....	167.24	381.20
No. 785	163.28	.....	.....	51.87	111.41
J. R. Macomber Fund	523.30	.....	.....	487.38	35.92
Carnegie Pension Account	.....	53,597.15	.....	53,597.15	.....
Carnegie Corp. Account	4,000.00	.....	.....	4,000.00	.....

* Overdraft.
[1] Appropriation from Current Income.
[2] By Transfer.

Schedule R (*Continued*)

Name	*Balance June 30, 1934*	*Income*	*Other Increases*	*Salaries and Expenses*	*Balance June 29, 1935*
Chemistry:					
Rockefeller Research	$5,346.12	.....	[2]$7,620.00	$8,446.13	$4,519.99
Special, No. 1065	.....	.....	[1]250.00	55.25	194.75
Res. Lab. Phys. Chem. Royalties.	594.93	.....	.....	.....	594.93
Civil Engineering — Special Res..	1.20	.....	.....	1.20	.....
Soil Mech., No. 632	194.20	.....	[1]800.00	462.76	531.44
Spec. No. 1056, Cement Res.	.....	$1,100.00	[1-2]2,400.00	3,286.34	213.66
Masonry Mat. Res. Fund	49.00	1,178.34	.....	1,227.34	.....
Special Structural Lab.	186.96	.....	.....	186.96	.....
No. 1024 C. E. Camp	1,325.00	.....	.....	1,325.00	.....
Special Research — Carlson	.....	402.07	.....	402.07	.....
No. 913	3,509.23	.....	.....	2,181.47	1,327.76
No. 1068	.....	5,000.00	.....	1,231.06	3,768.94
Crafts Library Fund	198.68	50.00	.....	142.43	106.25
Dean's Special Fund	15.27	95.00	.....	.....	110.27
Dining Service Reserve	4,291.50	.....	.....	4,291.50	.....
Div. of Industrial Co-operation	.....	77,501.39	[2]5,532.25	83,033.64	.....
Dormitory Tax	9.18	.....	[2]1,180.00	1,189.18	.....
Dormitory Commission Account	.....	1,322.43	[2]217.66	1,540.09	.....
Electrical Engineering:					
No. 1082	.....	277.90	[1-2]517.59	795.49	.....
VI-A Fund	149.16	.....	[1]750.00	748.02	151.14
Fog Research	1,948.00	500.00	[2]52.00	2,500.00	.....
Fog Research — Navy	.....	.....	.....	7,497.42	*7,497.42
Network Analyzer	1,238.34	1,455.00	.....	582.63	2,110.71
Rockefeller Research	534.36	.....	.....	64.78	469.58
Sputtering Res.—Timoshenko	.....	1,000.00	.....	369.56	630.44
Round Hill	*2,700.78	.....	[1-2]10,829.94	8,479.15	*349.99
Nat. Elec. Light Assoc.	74.45	.....	.....	74.45	.....
Account 4133	5,207.75	6,000.00	.....	4,846.46	6,361.29
Differential Analyzer	2,026.09	157.50	[1-2]2,871.00	4,968.59	86.00
Special Research—Sinclair	1,800.00	2,200.00	.....	1,800.00	2,200.00
Employees Health and Acc. Ins.	.....	4,951.50	.....	4,951.50	.....
Eng. Council for Prof. Development	.....	329.29	.....	405.38	*76.09
Engineering Research	5,000.00	.....	.....	3,972.62	1,027.38
Eng. Research special — Lamar	156.27	.....	.....	67.62	88.65
Eng. Research special — Bitter	.....	.....	[2]500.00	.....	500.00
Eng. Research special—Edgerton	.....	.....	[2]500.00	500.00	.....
Eng. Research special — Wolff	.....	.....	[2]600.00	70.00	530.00
Eng. Research special — Hardy	.....	.....	[2]200.00	.....	200.00
Freeman Translation Fund	344.62	.....	.....	344.62	.....
Fuels Research Laboratory	3,248.88	2,640.55	.....	2,228.37	3,661.06
F. E. R. A.	*4.50	17.30	.....	12.80	.....
Geological Society 91–34	.....	3,000.00	.....	2,135.00	865.00
Geology, Rockefeller Research	2,905.16	.....	[2]4,450.00	5,267.58	2,087.58
Geology — No. 913	938.27	.....	.....	883.03	55.24
Geology, Special No. 1021	1,191.30	.....	[2]338.40	1,529.70	.....

* Overdraft.
[1] Appropriation from Current Income.
[2] By Transfer.

Schedule R (*Continued*)

Name	*Balance June 30, 1934*	*Income*	*Other Increases*	*Salaries and Expenses*	*Balance June 29, 1935*
Geology, Special, No. 1060	.....	$2,000.00	[2]$3,000.00	$271.71	$4,728.29
Graphic Arts Acct.	$14.97	.....	.....	.....	14.97
Historic Memorials	424.71	.....	.....	67.78	356.93
High. Volt. Power Proj. Fund (Research Corp.)	.....	.....	.....	1,992.66	*1,992.66
Geology—Foundation Mat'l. Res.	.....	.....	[2]1,500.00	1.60	1,498.40
Hygiene Department Special	†2,899.89	130.62	.....	1,514.80	1,515.71
Journal of Math. and Physics	4,333.75	489.44	.....	1,986.60	2,836.59
Keyes — Keenan Steam Table	.....	350.00	.....	297.29	52.71
Letter Shop	*752.58	20,812.91	[2]1,754.51	21,814.84	.....
Library, Special No. 1	294.99	385.85	.....	465.02	215.82
Building 6 Equip. Acct.	945.12	50.00	.....	829.95	165.17
No. 1011	166.54	.....	[1]300.00	280.86	185.68
No. 1086	.....	.....	[1]300.00	.....	300.00
Mechanical Engineering—No. 482	485.00	.....	.....	.....	485.00
Shop Account	.....	.....	[2]419.57	419.57	.....
No. 1069	.....	5,000.00	.....	564.36	4,435.64
No. 1063	.....	.....	[1]250.00	250.00	.....
Textile Research School	.....	.....	[1]296.81	296.81	.....
No. 1083	.....	.....	[1]139.90	139.90	.....
Mining Engineering:					
Ore Dressing	361.30	.....	.....	.....	361.30
A. P. S. Research	.....	1,000.00	.....	.....	1,000.00
Special Travel Fund	200.00	.....	[1]275.00	475.00	.....
Penrose Fund	.....	250.00	.....	4.46	245.54
Nat. Research Council—Whitman	.....	1,000.00	.....	1,000.00	.....
Nat. Research Council — Beattie	.....	500.00	.....	.....	500.00
Navy Vibration Research	.....	4,999.50	.....	8,778.78	*3,779.28
Nuclear Research	5,291.96	.....	[1]9,686.00	14,653.27	324.69
Placement Committee Fund	39.16	.....	[1]300.00	246.80	92.36
Patent Committee Fund	1,659.90	.....	.....	1,389.28	270.62
Photographic Service	221.58	25,055.57	[2]1,260.09	26,687.49	*150.25
Photostat Service	210.51	.....	.....	210.51	.....
Photostat — Reserve	1,000.00	.....	.....	1,000.00	.....
Physics Department, Special	318.89	.....	.....	155.88	163.01
Roentgen Ray	1,883.42	.....	.....	451.16	1,432.26
Hale Spectroscopic Fund	1,486.20	.....	.....	.....	1,486.20
Rockefeller Research Fund	1,410.32	.....	[2]9,425.00	9,383.78	1,451.54
Permanent Science Fund	500.00	.....	.....	.....	500.00
Rockefeller Special Res.	.....	2,600.00	.....	2,000.00	600.00
Rumford Grant, A. A. of A. & S.	278.62	.....	.....	.....	278.62
Rumford Grant, Hardy	211.99	.....	.....	8.67	203.32
Rumford Grant, S.	*17.42	400.00	[2]66.22	432.43	16.37
Rumford Grant, Harrison	263.70	.....	.....	.....	263.70
Summer Spect. Conference	.....	.....	.....	49.45	*49.45

* Overdraft.
[1] Appropriation from Current Income.
[2] By Transfer.
† Exclusive of student notes receivable. (See Schedule P, page 156.)

Schedule R (*Continued*)

Name	*Balance June 30, 1934*	*Income*	*Other Increases*	*Salaries and Expenses*	*Balance June 29, 1935*
Physics Department, Special (*Cont.*)					
Salary Account	$1,260.00	$1,200.00	[2]$200.00	$2,213.08	$446.92
No. 916	161.60	.....	.....	92.41	69.19
No. 1023	1,097.00	12.25	.....	1,109.25	.....
No. 1066	.....	.....	[1]1,550.00	855.33	694.67
Smithsonian Fund	.....	500.00	.....	500.00	.....
Special Research — Boyce	.....	400.00	.....	252.20	147.80
Special Research—Gilfilian	.....	200.00	.....	.....	200.00
Suspense — Physics	.....	350.00	.....	.....	350.00
President's Special Fund	1,317.93	.....	.....	1,307.00	10.93
President's Fund	1,150.00	.....	[1,2]652.05	1,802.05	.....
Register of Former Students	.....	2,913.50	[2]2,000.00	6,815.52	*1,902.02
R. O. T. C. Uniform and Subsistence Accounts	715.82	5,780.70	.....	5,760.40	736.12
Research Associates of M. I. T.	.....	3,000.00	.....	.....	3,000.00
Safe Harbor Hydraulic Account	*48.43	.....	[2]52.84	4.41	.....
Salaries Reserve Fund	.....	57,098.63	.....	57,098.63	.....
Special, No. 1070	.....	.....	[1]75.00	75.00	.....
Special, No. 1080	.....	.....	[1]7,711.78	7,711.78	.....
Special, No. 1067, Open House	.....	.....	[1,2]1,085.03	1,085.03	.....
Special, No. 952 (Tech. Movie)	.....	.....	191.34	191.34	.....
Special, No. 1053	.....	.....	[1]600.00	600.00	.....
Special, No. 1064	.....	.....	[1]150.00	150.00	.....
Special, No. 1079—Publication—Hardy	.....	.....	[1]1,700.00	649.00	1,051.00
Special, No. 1028 — Century of Progress	2,082.03	.....	.....	2,082.03	.....
Special, No. 1034 — Space Allocation	5,926.02	5.00	[2]2,540.64	8,471.66	.....
Special, No. 1044	.....	.....	[1]1,500.00	1,500.00	.....
Special — Publication Account	75.00	.....	.....	75.00	.....
Special, No. 1045—Pittsburgh Exhibit	.....	.....	[1]622.30	622.30	.....
Special, No. 1087	.....	.....	[1]96.64	96.64	.....
Special, No. 1089 — Grading	.....	.....	[1]5,000.00	.....	5,000.00
Special, No. 1096 — Alterations	.....	.....	.....	294.18	*294.18
Special — Power Plant No. 1026	5,445.00	.....	.....	5,445.00	.....
Special — Public Service Admin., Summer School	.....	.....	.....	486.66	*486.66
Suspense Accounts	*814.04	.....	[2]108,164.62	104,409.78	2,940.80
Suspense Account — Special	2,417.70	.....	.....	.....	2,417.70
Tech Loan Fund Committee	.....	89,482.30	[2]63,174.45	152,656.75	.....
Tech Loan Fund — Interest	1,921.46	13,497.30	.....	12,778.35	2,640.41
Tech Loan Fund — Principal	13,669.13	59,385.48	.....	50,396.10	22,658.51
Technology Press	123.81	1,000.00	[2]1,453.11	1,296.91	1,280.01
Technology Press — Special	1,328.49	.....	.....	1,328.49	.....
Textile Foundation, Special Res.	.....	400.00	.....	3.15	396.85
Textile Research Fund	31.74	.....	[2]2,568.72	2,600.46	.....
Textile Research Fund, No. 1081	.....	.....	[2]350.00	331.56	18.44
U. S. Cape Cod Canal Research	.....	4,750.29	.....	5,771.51	*1,021.22
Visual Education Account	.....	.....	[2]3,500.00	3,753.80	*253.80
Walker Memorial Library	.03	.....	[2]3,390.75	3,428.40	*37.62
Water Cooler Research	.....	4,270.12	.....	4,533.99	*263.87
Totals	$132,792.76	$493,655.85 (Schedule B)	$286,961.74	$806,239.42 (Schedule C)	$107,170.93 (Schedule D)

*Overdraft.
[1] Appropriation from Current Income.
[2] By Transfer.

SCHEDULE S

CURRENT DEFICIT

Deficit, June 30, 1934	$29,878.64
Net Decrease (Schedule A)	4,927.42
Deficit, June 30, 1935 (Schedule D)	$24,951.22

DETAIL OF PROFIT AND LOSS ACCOUNT

GAINS AND CREDITS:	
Premium Refund Account Employees' Insurance	$700.00
Tax Abatements, 1933	1,386.87
1933–34 Appropriation Adjustments	2,300.00
Miscellaneous Credits	1,349.00
Total Gains	$5,735.87
LOSSES AND CHARGES:	
Students' Accounts (previous years), charged off	$959.34
Miscellaneous Charges	87.84
Total Losses	$1,047.18
Net Profit (Schedule A)	$4,688.69

THE ENDOWMENT FUNDS OF THE INSTITUTE

(Alphabetically listed — see listing by groups on pages 150–155 with corresponding reference numbers, showing transactions during the year and balances as of June 29, 1935.)

207 ALBERT FUND, 1930, 1933, 1935, $11,500. Gift from anonymous donor to pay five years rental of M. I. T. Student House on Bay State Road, Boston.

208 ALPHA CHI SIGMA HOUSE FUND (Alpha Zeta Chapter), 1935, $2,340.96. Deposited for investment purposes only.

209 ANONYMOUS, 1924, $1,052.50. Gift of member of Class of 1924 to accumulate until twenty-fifth reunion of Class in 1949.

361 ARKWRIGHT CLUB FELLOWSHIP, 1926–27, $2,000. Gift. For graduate student in Industrial Chemistry or other textile activity.

101 GEORGE ROBERT ARMSTRONG FUND, 1902, $5,000. Bequest of George W. Armstrong in honor of son. Income available for general purposes of the Institute.

401 ELISHA ATKINS SCHOLARSHIP FUND, 1894, $5,000. Bequest of Mary E. Atkins.

301 WILLIAM PARSONS ATKINSON FUND, 1918, $13,000. Bequest of Charles F. Atkinson as a memorial to father — for English Department of the Institute.

501 EDWARD AUSTIN FUND, 1899, $400,000. Bequest. Interest paid to needy, meritorious students and teachers to assist in payment of studies.

503 THOMAS WENDELL BAILEY FUND, 1914, $2,200. Bequest. Income used for rendering assistance to needy students in Department of Architecture.

504 CHARLES TIDD BAKER FUND, 1922, $20,000. Bequest. One-half of net income for assistance of poor and worthy students and one-half to principal.

151 EDMUND DANA BARBOUR FUND, 1926, $847,000. Bequest. Principal and income for general purposes of Institute.

271 WALTER S. BARKER FUND, 1927, $10,000. Bequest. Income only available for purposes of the Library.

403 BILLINGS STUDENT FUND, 1900, $50,000. Bequest of Robert C. Billings. Students receiving benefit are expected to abstain from use of alcohol or tobacco in any form.

102 GEORGE BLACKBURN MEMORIAL FUND, 1931–1935, $906,000. Bequest of Harriette A. Nevins. Income for general purposes.

481 ROBERT A. BOIT FUND, 1921, $5,000. Bequest. Income to stimulate students' interest in best use of English Language through annual prizes or scholarships.

303 FRANK WALTER BOLES MEMORIAL FUND, 1915, $25,200. Under agreement between Harriet A. Henshaw and M. I. T. Income paid to committee of Department of Architecture, to purchase fine arts material and to supplement and strengthen instruction in architectural design.

506 LEVI BOLES FUND, 1915, $10,000. Bequest of Frank W. Boles in memory of father. Income for assistance of needy and deserving students.

363 WILLIAM SUMNER BOLLES FUND, 1924, $9,400. Bequest of William P. Bolles in memory of son, to maintain either fellowship, traveling scholar ship or resident scholarship. Recipient to have character, ability or promise.

404 JONATHAN BOURNE FUND, 1915, $10,000. Bequest of Hannah B. Abbe. Income to aid deserving students.

405 ALBERT G. BOYDEN FUND, 1931, $579,000. Bequest. Estate of Elizabeth R. Stevens. Income for scholarships. Preference to students from Fall River and Swansea, Mass.

406 HARRIET L. BROWN FUND, 1922, $6,000. Bequest. Income to needy and deserving young women students, as would otherwise be unable to attend. In case two or more applicants of equal merit, preference given to native of either Massachusetts or New Hampshire.

364 MALCOLM COTTON BROWN FUND, 1919, $11,000. Under agreement between Caroline Cotton Brown, Charles A. Brown and M. I. T., to establish memorial to son, Lieutenant Brown, R. A. F., killed in service 1918, for advanced study and research in Physics. Income to Senior in high standing for graduate study — not a condition but other things being equal, the fellowship to be awarded to member of Phi Gamma Delta.

508 BURSAR'S FUND, 1907, $6,000. Bequest of Lyman S. Rhoads. Income and repayments used for loans to students in discretion of Bursar, subject to approval of President and Treasurer.

343 SAMUEL CABOT FUND, 1912, $50,000. Gift of Helen N. Cabot in honor of husband. Income for purchase of apparatus and supplies required in conduct of research in Industrial Chemistry.

510 MABEL BLAKE CASE FUND, 1920, $25,000. Bequest of Caroline S. Freeman. Income to aid deserving students (preferably women) who are in need of assistance.

408 NINO TESHER CATLIN FUND, 1926, $1,000. Gift of Maria T. Catlin in memory of son. Income for needy and deserving students — not a condition but if possible award to be made to member of Lambda Phi Fraternity.

305 WILLIAM E. CHAMBERLAIN FUND, 1917–19, $6,000. Bequest. Income used for Department of Architecture.

511 CHANDLER FUND, 1927, $2,700. Gift from Architectural Society. A loan fund to be administered by Head of Architectural Department.

307 CHEMICAL ENGINEERING PRACTICE FUND, 1915–16, $300,000. Gift of George Eastman for Chemical Engineering Stations provided Institute will carry forward this plan of education for a reasonable period.

273 EDNAH DOW CHENEY FUND, 1905–06, $13,900. Bequest. Income for maintenance and care of Margaret Cheney Room for women students.

103 CHARLES CHOATE FUND, 1906, $25,000. Bequest. Income for general purposes.

274 FRANK HARVEY CILLEY FUND, 1913, $57,700. Bequest. Income and such part of principal as necessary for purchase of suitable books, photographs, statuary, etc., for library and gymnasium of Walker Memorial.

411 LUCIUS CLAPP FUND, 1905, $4,900. Bequest. Income to worthy students who may not be able to complete their studies without help.

230 CLASS OF 1874 FUND, 1934, $180. Held subject to use by Class of 1874.

413 CLASS OF '96 FUND, 1923, $2,272. Gift. Award subject to approval of Class Secretaries. Preference to descendants of members of Class Scholarships to be considered a loan to be repaid when and if able.

229 CLASS OF 1898 LOAN FUND, $5,535. By subscription of certain members of class from 1927–1931. Income only for scholarship loans, as authorized by committee of class.

483 CLASS OF 1904 FUND, 1925, $392. Contributions received by Professor Gardner for Architectural Department prizes.

210, 212, 214, 216, 217, 218, 220, 221, 222, 223, 224.

CLASS ENDOWMENT FUNDS

Note: These funds are being accumulated for the several classes whose members took out life insurance toward a gift to the Institute on their Twenty-Fifth Reunions.

The Class Endowments are of funds permanently held toward the final sum.

From certain of these, a portion may be applied in accordance with the terms of the several plans toward keeping alive policies that might lapse on account of non-payment or as otherwise designated.

251 SAMUEL C. COBB FUND, 1916, $30,000. Bequest. Income for salaries of President and professors.

512 FRED L. AND FLORENCE L. COBURN FUND, 1932, $5,000. Bequest. Income to aid needy and worthy students, preference being given to those residing in Somerville, Mass.

514 COFFIN MEMORIAL FUND, 1929, $35,000. Gift of the Estate of Charles A. Coffin. For loans or other aid to students as determined by Executive Committee.

366 COLLAMORE FUND, 1916, $10,000. Bequest of Helen Collamore. Income primarily to aid women students in post-graduate courses, secondarily, for purchase of instruments for Chemical Laboratory.

344 CRANE AUTOMOTIVE FUND, 1928, $5,000. Gift of Henry M. Crane. Reserved for purchase of further equipment for Aeronautical Laboratory when necessary.

415 LUCRETIA CROCKER FUND, 1916, $50,000. Bequest of Matilda H. Crocker. Income for establishment of scholarships for women in memory of sister.

309 CROSBY HONORARY FUND, 1916, $1,633. Contributions in honor of William Otis Crosby (Professor Emeritus). Income for upbuilding of the Geological Department, especially its collections.

368 DALTON GRADUATE CHEMICAL FUND, 1896, $5,000. Gift of Charles H. Dalton. Income for scholarships for American male graduates of M. I. T., for advanced chemical study and research — preference given to chemical research especially applicable to textile industries.

417 ISAAC W. DANFORTH FUND, 1903, $5,000. Bequest of James H. Danforth. Income for scholarship purposes as a memorial to brother.

516 DEAN'S FUND, 1924, $3,350. Contributions. To be loaned by Dean to needy students.

518 CARL P. DENNETT FUND, 1926, $500. Gift. To be loaned to students, preferably Freshmen, at discretion of President.

420 ANN WHITE DICKINSON FUND, 1898, $40,000. Bequest. Income used to establish free scholarships. Such persons enjoying benefit shall be worthy young men of American origin.

520 DORMITORY FUND, 1903, $2,700. Contributions. Income for scholarship purposes.

311 SUSAN E. DORR FUND, 1914, $95,000. Bequest. Income for use and benefit of Rogers Physical Laboratory.

104 EBEN S. DRAPER FUND, 1915, $100,000. Bequest. Income used for general purposes of the Institute.

421 THOMAS MESSINGER DROWN FUND, 1928, $50,000. Bequest of Mary Frances Drown. Income to establish scholarships for deserving undergraduate students.

105 COLEMAN DU PONT FUND, 1931, 1935, $159,000. Bequest. Income for support and maintenance of the Institute.

107 EASTMAN CONTRACT FUND, 1924, $9,500,000. Gift of George Eastman. Income for general purposes of the Institute.

108 GEORGE EASTMAN BUILDING FUND, 1916–17, $2,500,000. Gift of George Eastman on condition that $1,500,000 be raised by alumni and others. Balance to be used as needed for new educational buildings. $1,225,000 used for George Eastman Research Laboratories in 1932.

312 GEORGE EASTMAN FUND, 1918, $400,000. Gift of George Eastman. Income for Chemistry and Physics. Principal available for addition to EASTMAN BUILDING FUND after latter is exhausted.

109 CHARLES W. EATON FUND, 1929, $243,000. Bequest. Income for advancement of general purposes of Institute.

112 EDUCATIONAL ENDOWMENT FUND, 1920–21, $7,574,000. $4,000,000 gift from George Eastman and balance contributed by alumni and others. Income for current educational expenses.

113 MARTHA ANN EDWARDS FUND, 1890, $30,000. Gift. Income for general purposes.

521 FRANCES AND WILLIAM EMERSON FUND, 1930, $100,000. Gift. Income for aid of regular and special students in Department of Architecture.

114 WILLIAM ENDICOTT FUND, 1916, $25,000. Bequest. Income for general purposes.

205 ENDOWMENT RESERVE FUND, 1924. Created and otherwise increased by gains from sales or maturities of investments and decreased by premium amortization of bonds and losses and charges from sales or maturities. Belongs to all funds sharing general investments.

206 ENDOWMENT RESERVE INCOME FUND, 1934, $14,400. Excess income over total allotted to funds participating in income from General Investments for year 1933-34. Distributed to funds 1934-35.

424 FARNSWORTH FUND, 1889, $5,000. Bequest of Mary E. Atkins. Income for scholarships

153 HENRIETTA G. FITZ FUND, 1930, $10,000. Bequest. Income for general purposes.

426 CHARLES LEWIS FLINT FUND, 1889, $5,000. Bequest. Income for support of worthy student, preference given graduate of English High School, Boston.

277 CHARLES LEWIS FLINT FUND, 1889, $5,000. Bequest. Income for purchase of books and scientific publications for library.

253 SARAH H. FORBES FUND, 1901, $500. Gift of Malcolm Forbes as memorial to mother. Income for salaries.

427 SARAH S. FORBES FUND, 1913, $3,400. Gift of Sarah S. Forbes, William B. Rogers and Henry S. Russell. Income for maintenance and education of scholar in M. I. T.

117 FRANCIS APPLETON FOSTER FUND, 1922, $1,000,000. Bequest. Income for purposes of Institute.

118 ALEXIS H. FRENCH FUND, 1930, $5,000. Bequest. Income for general purposes of Institute.

119 JONATHAN FRENCH FUND, 1915–16, $25,000. Bequest of Caroline L. W. French. Income for purposes of the Institute.

121 HENRY CLAY FRICK FUND, 1925–32, $1,830,000. Bequest. Institute received ten shares of a total of one hundred shares of his residuary estate. Income for general purposes.

429 FUEL AND GAS SCHOLARSHIP FUND, 1925–26, $700. Gift Boston Consolidated Gas Company and Massachusetts Gas Companies for scholarship in Gas Engineering.

255 GEORGE A. GARDNER FUND, 1898, $20,000. Gift. Income for salaries of instructors.

122 GENERAL ENDOWMENT FUND, 1921, $1,527,000. Contributions by alumni and others to meet George Eastman's condition relative to gift of $2,500,000, his building fund (No. 108).

523 NORMAN H. GEORGE FUND, 1919, $70,000. Bequest. Income for assistance of worthy and needy students.

525 JOHN A. GRIMMONS FUND, 1930–35, $6,648.68. Bequest of C. Lillian Moore of Malden. Principal held by Old Colony Trust Co., Trustee. Income for loans to undergraduates in Electrical Engineering not to exceed $600 to any one student in any one year with interest at 5 per cent and to be repaid within ten years. Loans to be awarded to male, white, native-born citizens of United States and to be protected by life insurance.

527 JAMES H. HASTE FUND, 1930, $181,000. Bequest. Income for aid of deserving students of insufficient means.

259 JAMES HAYWARD FUND, 1866, $18,000. Bequest. Income for salaries.

155 JAMES W. HENRY FUND, 1935, $8,226. Bequest. To be used by Institute in manner deemed best.

431 GEORGE HOLLINGSWORTH FUND, 1916, $5,000. Bequest of Rose Hollingsworth. Income used for scholarship.

485 ROGER DEFRIEZ HUNNEMAN PRIZE FUND, 1927, $1,060. Gift of W. C. Hunneman in memory of Roger Defriez Hunneman, '23. Income paid as annual award to most meritorious student in Chemical Engineering who has shown most outstanding originality in his work as determined by that Department.

433 T. STERRY HUNT FUND, 1894, $3,000. Bequest. Income to a student in Chemistry.

434 WILLIAM F. HUNTINGTON FUND, 1892, $5,000. Gift of Susan E. Covell. Income to deserving students. Preference to be given to students in Civil Engineering.

157 INDUSTRIAL FUND, 1924–31. This fund succeeded "Tech Plan" Contracts, payments under which went to the Educational Endowment Fund. Income and part of principal now used in support of Division of Industrial Coöperation.

123 JAMES FUND, 1898–99, $163,000. Bequest of Julia B. H. James. Income for development of M. I. T.

529 DAVID L. JEWELL FUND, 1928, $25,000. Bequest. Income for tuition of five young men who are worthy of assistance and who, were it not for such assistance, might be unable to pursue their studies at M. I. T.

374 REBECCA R. JOSLIN FUND, 1924, $1,540. Gift. Income awarded as a loan to advanced student in Chemical Engineering on recommendation of that Department — restricted to native and resident of Massachusetts. Beneficiary to abstain from using tobacco in any form.

436 JOY SCHOLARSHIPS, 1886, $7,500. Gift of Nabby Joy. Income for scholarships for one or more women studying natural science at M. I. T.

280 WILLIAM HALL KERR FUND, 1896, $2,000. Gift of Alice M. Kerr. Income for the annual purchase of books and drawings in machine design.

276 WILFRED LEWIS FUND, 1930, $5,000. Gift of Emily Sargent Lewis. Income for maintenance of graduate student in Mechanical Engineering.

438 WILLIAM LITCHFIELD FUND, 1910, $5,000. Bequest. Income for scholarship on competitive examination.

158 HIRAM H. LOGAN FUND, 1933, $17,000. Bequest. Principal and income for general purposes of M. I. T.

439 ELISHA T. LORING FUND, 1890, $5,000. Bequest. Income for assistance of needy and deserving pupils.

228 LOUISVILLE TECHNOLOGY FOUNDATION FUND, 1935, $50. Founded by Louisville Tech Club toward scholarship aid for local student.

441 LOWELL INSTITUTE FUND, 1923, $2,300. Gift from alumni of Lowell Institute to establish scholarship for its graduates.

125 KATHARINE B. LOWELL FUND, 1895, $5,000. Gift of Augustus Lowell in honor of Mrs. Lowell. Income for purchase of books and apparatus for Department of Physics.

442 RUPERT A. MARDEN FUND, 1933, $2,000. Gift (anonymous). Income to aid worthy student — Protestant and of American origin — preference to student taking Coöperative Course in Electrical Engineering (Course VI-A).

261 WILLIAM P. MASON FUND, 1868, $18,800. Bequest. Income to support a professorship in the Institute.

127 M. I. T. ALUMNI FUND, 1907. Total subscriptions of alumni to 1924, $632,500. $632,000 appropriated for New Equipment, Walker Memorial 1916 Reunion and Dormitories. Present small balance unappropriated.

227 M. I. T. ALUMNI ASSOCIATION PERMANENT FUND, 1929–35, $54,278. Deposited with M. I. T. for investment purposes only.

225 M. I. T. TEACHERS' INSURANCE FUND, 1926. Balance of 2 per cent salary deductions under M. I. T. Pension and Insurance Plan in excess of Group Insurance Premiums paid.

226 M. I. T. TEACHERS' INSURANCE FUND SPECIAL, 1928–35, $61,000. Refund of premiums paid on Group Insurance under M. I. T. Pension and Insurance Plan held at interest and accumulated. $50,000 appropriated for special pension purposes.

316 JOHN LAWRENCE MAURAN FUND, 1934, $10,000. Bequest. Principal and income may be used for benefit of Department of Architecture.

317 GEORGE HENRY MAY FUND, 1914, $4,250. Gift. Income for benefit of Chemical Department.

443 GEORGE HENRY MAY FUND, 1914, $5,000. Gift. Income to assist graduates of Newton High School recommended as eligible by superintendent and head masters of Newton High Schools. Beneficiary to issue a note payable without interest.

126 THOMAS MCCAMMON FUND, 1930, $15,000. Bequest in honor of father, James Elder McCammon. Income available for general purposes.

487 JAMES MEANS FUND, 1925, $2,700. Gift of Dr. James H. Means as a memorial to father. Income for annual prize for essay on an aeronautical subject.

159 HIRAM F. MILLS FUND, 1922, $5,000. Bequest. For general purposes.

319 Susan Minns Fund, 1930. Gift of Miss Susan Minns — tract of land on Memorial Drive for use in any way deemed best for benefit of plan regarding construction and maintenance of an hydraulic laboratory.

445 James H. Mirrlees Fund, 1886, $2,500. Gift of James Buchanan Mirrlees. Income to such student in third or fourth year Mechanical Engineering most deserving pecuniary assistance.

320 Forris Jewett Moore Fund, 1927–31, $32,000. Gift of Mrs. F. Jewett Moore as a memorial to husband. Income or principal expended subject to approval of Executive Committee by a committee of three members of the Department of Chemistry — to make the study of Chemistry more interesting and surroundings of such study more attractive.

378 Moore Fund, 1914–28–29, $24,200. Gift of Mrs. F. Jewett Moore. Income to help some Institute graduate to continue studies in Europe, especially organic chemistry. Preference to student who has distinguished himself in this subject while an undergraduate.

128 Kate M. Morse Fund, 1925, $25,000. Bequest. Income for general purposes of M. I. T.

129 Everett Morss Fund, 1934, $25,000. Bequest. Income for general purposes of M. I. T.

447 Nichols Fund, 1895, $5,000. Bequest of Betsy F. W. Nichols. Income for scholarship to student in Chemistry.

448 Charles C. Nichols Fund, 1904, $5,000. Bequest. Income for scholarship.

322 William E. Nickerson Fund, 1928, $50,000. Gift. Principal and income used to finance chair in Humanics.

161 Moses W. Oliver Fund, 1921, $11,000. Bequest. Principal or income for general purposes.

283 George A. Osborne Fund, 1928, $10,000. Bequest. Income for benefit of mathematical library.

450 John Felt Osgood Fund, 1909, $5,000. Bequest of Elizabeth P. Osgood in memory of husband. Income for scholarship in Electricity.

451 George L. Parmelee Fund, 1921, $17,000. Bequest. Income for tuition of either special or regular worthy students.

162 Emerette O. Patch Fund, 1935, $7,500. Bequest. Principal or income for general purposes.

131 Richard Perkins Fund, 1887, $50,000. Bequest. Income for general purposes.

453 Richard Perkins Fund, 1887, $50,000. Bequest. Income for scholarships.

380 Willard B. Perkins Fund, 1898, $6,000. Bequest. Income to be expended every fourth year for travelling scholarship in architecture.

324 Edward D. Peters Fund, 1924, $5,000. Bequest of Elizabeth W. Peters. Income for the Department of Mineralogy.

163 Preston Player Fund, 1933, $20,000. Bequest. For general purposes, unrestricted.

325 Pratt Naval Architectural Fund, 1916, $1,071,000. Bequest of Charles H. Pratt to endow the Department of Naval Architecture and Marine Engineering to be called forever Pratt School of Naval Architecture and Marine Engineering — to erect a building — remainder held in trust. Income to support said school.

382 Proctor Fund, 1929–30. Gift annually from Redfield Proctor for fellowship in Physics.

231 Professors' Fund, 1931. Contributions of one half of outside income earned by members of staff to July 1, 1934. Plan suspended July 1, 1934. Disbursed on recommendation of committee appointed by contributors.

384 PROPRIETORS LOCKS AND CANALS FUND, 1927, $4,000. Gift to finance post-graduate scholarship in Textile Research, mechanical or chemical, to American-born graduate of Lowell Textile School, nominated by the Trustees of that School and approved by Executive Committee of Locks and Canals.

132 J. W. & B. L. RANDALL FUND, 1897, $83,000. Bequest of Belinda L. Randall as a permanent fund or in erecting a building with those names.

454 THOMAS ADELBERT READ FUND, 1934–35, $21,117. Bequest of Julia A. Read to establish Scholarship in memory of her brother Thomas Adelbert, and their father William Read, and mother Amanda Snow Read. Income to be awarded to some worthy and needy student, preferably resident of Fall River, Mass.

233 RICHARDS PORTRAIT FUND, 1929. Balance of subscriptions from friends of Prof. R. H. Richards for portrait completed — available for Mining Department.

349 ELLEN H. RICHARDS FUND, 1912, $15,000. Income for promotion of research in Sanitary Chemistry, for fellowships to advanced students, for employment of research assistants and in such other ways as will best promote investigation in that field.

351 CHARLOTTE B. RICHARDSON FUND, 1891, $30,000. Bequest. Income to support of Industrial Chemical School.

235 ROCKEFELLER FOUNDATION RESEARCH FUND, 1931–36, $170,000. Contributed for Research in Science Department over period of five years.

263 HENRY B. ROGERS FUND, 1873, $25,000. Gift. Income for salaries of one or more professors or instructors.

386 HENRY BROMFIELD ROGERS FUND, 1921, $20,000. Bequest of Anna Perkins Rogers. Income to establish fellowship or scholarship for women graduates of M. I. T. or other colleges whose graduate work is carried on at M. I. T.

165 ROBERT E. ROGERS FUND, 1886, $7,600. Bequest in memory of brother, William B. Rogers. For general purposes.

531 WILLIAM BARTON ROGERS FUND. Present, $20,000. Established by subscriptions of members of Alumni Association through Prof. R. H. Richards for loans to students.

135 WILLIAM BARTON ROGERS MEMORIAL FUND, 1883–4–5, $250,000. Contributions from 91 persons. Income for support of Institute.

286 ARTHUR ROTCH ARCHITECTURAL FUND, 1895, $5,000. Bequest. Income for Library or collection of Department of Architecture.

327 ARTHUR ROTCH FUND, 1895, $25,000. Bequest. Income for general purposes of Department of Architecture.

489 ARTHUR ROTCH FUND, 1895, $5,000. Bequest. Income for annual prize to student in regular course in Architecture graduating highest in class.

491 ARTHUR ROTCH SPECIAL FUND, 1895, $5,000. Bequest. Income for annual prize to student who shall be ranked highest at end of two years special course in Architecture.

388 RICHARD LEE RUSSEL FUND, 1904, $2,000. Gift of Theodore E. Russel. Income to assist worthy student of high standing in Department of Civil Engineering either undergraduate or post-graduate.

454a WILLIAM PATRICK RYAN MEMORIAL FUND, 1935, $3,637. Contributed by friends of Professor Ryan. Income for scholarship in Chemical Engineering.

236 WILLIAM PATRICK RYAN SPECIAL FUND, 1933. Appropriation. Educational fund for three children of late Prof. W. P. Ryan.

136 SALTONSTALL FUND, 1901, $40,000. Bequest of Henry Saltonstall. One-fourth income each year added to principal and remaining three-fourths expended for benefit of Institute.

390 HENRY SALTONSTALL FUND, 1901, $10,000. Bequest. Income to aid one or more needy students.

392 JAMES SAVAGE FUND, 1873, $10,000. Bequest. Income for scholarships in institution "where my son-in-law, William B. Rogers, is President."

137 SAMUEL E. SAWYER FUND, 1895, $4,000. Bequest. Income to be used in such manner as will best promote interests of M. I. T.

455 JOHN P. SCHENKL FUND, 1922, $20,000. Bequest of Johanna Pauline Schenkl in memory of father. Income for scholarships in Department of Mechanical Engineering.

237 SEDGWICK MEMORIAL LECTURE FUND, 1930–35, $7,300. Bequest of Mary Katrine Sedgwick in memory of husband. All copyrights and interest in copyrights and benefits from contracts with publishers for Department of Biology and Public Health.

329 W. T. SEDGWICK FUND, 1928, $69,500. Received from Trustees of the Estate of W. T. Sedgwick under Agreement and Declaration of Trust following decease of Mary Katrine Sedgwick, for Department of Biology and Public Health.

456 THOMAS SHERWIN FUND, 1871, $5,000. Gift of Committee on Sherwin Memorial Fund for free scholarship to graduate of English High School.

393 SLOAN FUND, 1933, $1,000. Gift of A. P. Sloan, Jr. for Fellowship in Automotive Engineering.

168 ELLEN VOSE SMITH FUND, 1930, $25,000. Bequest. For general purposes.

458 HORACE T. SMITH FUND, 1930, $32,988.76. Bequest. Income for scholarships. Preference to graduates of East Bridgewater (Mass.) and Bridgeport (Conn.) High Schools.

459 SONS AND DAUGHTERS OF NEW ENGLAND PURITAN COLONY SCHOLARSHIP FUND, 1931, $600. Gift. Income for scholarship aid to a boy of New England ancestry.

139 ANDREW HASTINGS SPRING FUND, 1921, $50,000. Bequest of Charlotte A. Spring in memory of nephew as a permanent fund. Income for general purposes.

493 SAMUEL W. STRATTON PRIZE FUND, 1933, $1,680. Contributed by friends of the late Dr. S. W. Stratton for competition prizes in the presentation of scientific papers.

532 SUMMER SURVEYING CAMP LOAN FUND, 1927, $500. Gift of Lammot du Pont as a revolving loan fund to help students in Civil Engineering attend summer surveying camp.

140 SETH K. SWEETSER FUND, 1915, $25,000. Bequest as a permanent fund. Income for general purposes.

395 SUSAN H. SWETT FUND, 1888, $10,000. Bequest. Income to support a graduate scholarship.

396 GERARD SWOPE FUND, 1926, $2,500. Annual gift for fellowships in Electrical Engineering.

534 TEACHERS' FUND, 1899–1900. Gifts of $50,000 each from Augustus Lowell and A. Lawrence Lowell to establish fund for use in case of retirement, disability or death of members of instructing staff.

288 TECHNOLOGY MATRONS TEAS FUND, 1916–22–31, $8,500. Gifts of Mrs. F. Jewett Moore. Income for social activities of Technology Matrons.

356 TEXTILE RESEARCH FUND, 1930, $42,000. Gift of Textile Alliance, Inc., for scientific and economic research for benefit of development of textile industry, its allied branches, including production of raw materials.

265 NATHANIEL THAYER FUND, 1868, $25,000. Gift. Income for professorship of Physics.

238 W. B. S. THOMAS FUND, 1935, $929.58. Gift of parents of W. B. S. Thomas '29, the income only to be expended for benefit of M. I. T. A. A.

239 ELIHU THOMSON FUND, 1929, $5,000. Gift.

266 ELIHU THOMSON PROFESSORSHIP, 1933, $1,479.60. Contributed toward fund for Professorship in Electrical Engineering.

397 FRANK HALL THORP FUND, 1932, $10,000. Anonymous gift. Income for fellowship in Industrial Chemistry.

460 SAMUEL E. TINKHAM FUND, 1924, $2,400. Gift of Boston Society of Civil Engineers. Income to assist worthy student in Civil Engineering.

289 JOHN HUME TOD FUND, 1913, $2,500. Gift of Mrs. F. Jewett Moore. Income for purchase of books of a humanistic character for General Library.

462 F. B. TOUGH FUND, 1924, $465. Gift to extend financial assistance to worthy students in mining or oil production.

331 EDMUND K. TURNER FUND, 1915, $178,000. Bequest. Income for a certain annuity during the life of sister — three-quarters of balance of income for Department of Civil Engineering and one-quarter to be added annually to principal.

240 UNDERGRADUATE ACTIVITIES TRUST FUND, 1935, $1,097.26. Established by 1916 Technique Board from which recognized student activities may borrow if deemed necessary and desirable, at a low rate.

243 UNDERGRADUATE DUES RESERVE FUND, ATHLETICS, 1924. Transferred from Undergraduate Dues (current operating account) to secure investment income.

244 UNDERGRADUATE DUES RESERVE FUND, CONTINGENT, 1924. Transferred from Undergraduate Dues (current operating account) to secure investment income.

333 WILLIAM LYMAN UNDERWOOD FUND, 1932, $9,872. Bequest. For benefit of Biological Department or otherwise for general purposes.

463 SUSAN UPHAM FUND, 1892, $1,000. Gift. Income to assist students deserving financial aid.

536 SAMSON R. URBINO FUND, 1927, $1,000. Bequest. Income for students who need assistance, Germans preferred.

291 THEODORE N. VAIL FUND, 1925, $24,000. Bequest. Income for benefit of Vail Library.

398 LUIS FRANCISCO VERGES FUND, 1924, $10,000. Gift from Caroline A. Verges. Income for graduate students doing research work in sugar industry or if no such candidate, undergraduate student in Civil Engineering.

465 VERMONT SCHOLARSHIP FUND, 1924–35, $18,000. Gift of Redfield Proctor, '02, in memory of Vermonters who, having received their education at the Institute, served as engineers in the armies of the Allies in the World War. Income to student preferably from Vermont. Mr. Proctor reserves right to designate recipient as long as he lives.

467 ANN WHITE VOSE FUND, 1896, $60,000. Bequest. Income for free scholarships for young men of American origin.

469 ARTHUR M. WAITT FUND, 1925, $9,700. Bequest. Income for deserving students in second, third and fourth year classes in Mechanical Engineering.

141 WILLIAM J. WALKER FUND, 1915–17, $23,000. Bequest. Income for general purposes.

144 HORACE HERBERT WATSON FUND, 1930, $31,000. Bequest of Elizabeth Watson Cutter as a permanent fund. Income for general purposes.

173 FRANK G. WEBSTER FUND, 1931, $25,000. Bequest. For general purposes.

471 LOUIS WEISBEIN FUND, 1915, $4,000. Bequest. Income for scholarship for student in Architectural Department, preference to be given to a Jewish boy.

145 ALBION B. K. WELCH FUND, 1871, $5,000. Bequest as a permanent fund. Income for general purposes.

146 EVERETT WESTCOTT FUND, 1935, $122,794. Bequest as a permanent fund. Income for general purposes.

473 FRANCES ERVING WESTON FUND, 1912, $200. Bequest. Received annually to aid a native-born American Protestant girl of Massachusetts. (Principal $5,000 turned over to M. I. T., 1931.)

474 SAMUEL MARTIN WESTON FUND, 1912. Bequest of Frances E. Weston in memory of husband. Two hundred dollars received annually to aid a native-born American Protestant boy; preference to be given one from Roxbury. (Principal $5,000 turned over to M. I. T. in 1931.)

476 AMASA J. WHITING FUND, 1927, $4,500. Bequest of Mary W. C. Whiting. Income as scholarship to deserving students; preference to students from the Town of Hingham, Massachusetts.

358 EDWARD WHITNEY FUND, 1910, $25,000. Bequest as a memorial to him and his wife, Caroline. Principal and interest for conduct of research or teaching in geophysics — to include investigations in seismology conducted with a view to the protection of human life and property.

537 JONATHAN WHITNEY FUND, 1912, $525,000. Bequest of Mrs. Francis B. Green. Income to assist poor and deserving young men and women in obtaining an education at M. I. T.

147 GEORGE WIGGLESWORTH FUND, 1931, $25,000. Bequest. Ten (10) per cent of gross annual income to be added to principal, balance of income for general purposes of the Institute.

477 ELIZABETH BABCOCK WILLMAN FUND, 1935, $6,005. Bequest. Income to be used toward tuition of young women students taking Chemistry courses.

148 EDWIN A. WYETH FUND, 1913–35, $269,665. Balance of Trust Fund held by M. I. T. since 1913 for itself and five other beneficiary institutions subject to annuity. Distributed January 1935. Fund separately invested and still subject to annuity.

539 MORRILL WYMAN FUND, 1915–16, $66,000. Bequest. Income to aid deserving and promising students upon understanding that if in after life the person receiving aid shall find it possible, he shall reimburse said fund — not a legal obligation.

AUDITORS' CERTIFICATE

We have examined the books and accounts of the Treasurer and Bursar of the Massachusetts Institute of Technology for the year ended June 29, 1935, and we report upon our verification of the accompanying financial statements of the Treasurer as follows:

The investment securities in the custody of the Old Colony Trust Company were examined by us on March 28, 1935; and as at June 29, 1935, we also agreed the investment accounts in detail with certified lists of securities obtained from the Old Colony Trust Company of Boston, Massachusetts, and verified the several other assets and liabilities shown in the Treasurer's Balance Sheet, Schedule D.

We satisfied ourselves by extensive tests of the recorded transactions for the year that income receivable had been duly accounted for and expenditures properly controlled and authorized.

WE HEREBY CERTIFY that, in our opinion, the accompanying Balance Sheet and Statements of Income and Expenditures correctly set forth, respectively, on the basis indicated, the financial condition of the Institute at June 29, 1935, and the financial results for the year ended at that date, and that the financial statements are in accordance with the books of the Institute.

We extended our examination to include the transactions of the Hewett Fund of which the Massachusetts Institute of Technology acts as Trustee, and satisfied ourselves that the provisions of the Trust agreement had been fulfilled. We also ascertained that the Wyeth Fund (of which the Institute acted as Trustee) had been distributed as of January 2, 1935, in accordance with the terms of an agreement between the Institute and five other beneficiaries named in the Trust Instrument.

Our examination embraced also the accounts of the Massachusetts Institute of Technology Pension Association which we found to be correctly stated.

The investment securities of the Wyeth Fund and of the Massachusetts Institute of Technology Pension Association in the custody of the Old Colony Trust Company were examined by us on March 28, 1935, and as of June 29, 1935, such investment securities were also checked with certified lists obtained from the Old Colony Trust Company.

Respectfully submitted,

PATTERSON, TEELE & DENNIS,
Accountants and Auditors

1 Federal Street, Boston, August 14, 1935.

REPORT OF THE AUDITING COMMITTEE

Boston, Mass., August 22, 1935.

We report that the firm of Patterson, Teele & Dennis, Accountants and Auditors, have examined the books and accounts of the Treasurer and the Bursar of the Massachusetts Institute of Technology for the fiscal year ended June 29, 1935 and their Certificate, dated August 14, 1935, is part of our report.

This report covers all of the books and accounts of the Treasurer and the Bursar and also all accounts of which the Massachusetts Institute of Technology acts as Trustee. It also covers the accounts of the Massachusetts Institute of Technology Pension Fund, which were examined on March 28, 1935 and as of June 29, 1935.

Respectfully submitted,

WILLIAM R. HEDGE
HAROLD B. RICHMOND
GODFREY L. CABOT, *Chairman.*

PERIODICAL PUBLICATIONS, BOOKS AND REVIEWS BY MEMBERS OF THE STAFF

DEPARTMENT OF AERONAUTICAL ENGINEERING

1. KENDRICK, JAMES B. *Modern Soaring Flight.* (The Tech. Eng. News, *16*, p. 28, April 1935.)

2. KOPPEN, OTTO C. *Lateral Control at High Angles of Attack.* (J. Aero. Sci. *2*, p. 22, January 1935.)

3. OBER, SHATSWELL. *Air Resistance of the Burlington Zephyr.* (Railway Gazette, *62*, p. 1184, June 1935.)

4. PETERS, HEINRICH. *Some Comments of the Theory of Boundary Layer.* (J. Aero. Sci. *2*, p. 68, March 1935.)

5. ROSSBY, CARL-GUSTAF and MONTGOMERY, RAYMOND B. *The Layer of Frictional Influence in Wind and Ocean Currents.* (Papers in Phys. Oceanography and Meteor. *3*, April 1935.)

6. TAYLOR, EDWARD S. *Present Views on the Nature of Detonation in the Otto Cycle Engine.* (J. Aero. Sci. July 1934.)

7. TAYLOR, EDWARD S. *Design Limitations of Aircraft Engines.* (Aero Digest, January 1935.)

8. TAYLOR, EDWARD S. *The Thermodynamics of Combustion in the Otto Cycle Engine.* (N. A. C. A. Technical Note No. 533, June 1935.)

DEPARTMENT OF ARCHITECTURE

9. ADAMS, FREDERICK J. *Shall Our Towns be Ribbons or Rounds?* (Boston Evening Transcript, Mag. Sec. p. 3, Saturday, August 25, 1934.)

10. EMERSON, WILLIAM. *The Use of Brick in French Architecture.* (Architectural Book Publishing Co., N. Y. C., June 1935.)

DEPARTMENT OF BIOLOGY AND PUBLIC HEALTH

11. BELDING, DAVID L. 1. *Improved Technical Methods for Determining the Annual Growth of Salmon Parr by Scale Measurements.* 2. *The Spawning Habits of the Atlantic Salmon.* 3. *The Cause of the High Mortality in the Atlantic Salmon after Spawning.* 4. *Spring-Run and Fall-Run Atlantic Salmon.* (Trans. Amer. Fisheries Soc. *64*, 1934.)

12. BUNKER, JOHN W. M. and HARRIS, ROBERT S. *The Clinical Status of Vitamin D Milks.* (N. E. J. Medicine, *211*, pp. 1140–47, December 1934.)

13. BUNKER, JOHN W. M. and HARRIS, ROBERT S. *The Phytin Phosphorus of the Corn Component of a Rachitogenic Diet.* (J. Nutrition, *9*, pp. 301–309, March 1935.)

14. BUNKER, JOHN W. M. and HARRIS, ROBERT S. *Roentgenographic Study of Gastro-intestinal Motility in Rachitic Rats.* (Am. J. Roentg. & Radium Therapy, *33*, pp. 25–30, 1935.)

15. BUNKER, JOHN W. M. and HARRIS, ROBERT S. *et al. A Comparison of Yeast Milk and Irradiated Milk in the Treatment of Infantile Rickets.* (N. E. J. Medicine, *212*, pp. 257–262, February 1935.)

16. BUNKER, JOHN W. M. and JENNISON, MARSHALL W. *Analysis of the Movement of Cilia from the Clam (Mya) by High-Speed Photography with Stroboscopic Light.* (J. Cellular & Comp. Physiol. *5*, p. 189, October 1934.)

17. GOULD, BERNARD S. *The Crystalline Pigments of Species in the Aspergillus Glaucus Series.* (Biochemical J. *28*, pp. 1640–56, 1934.)

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