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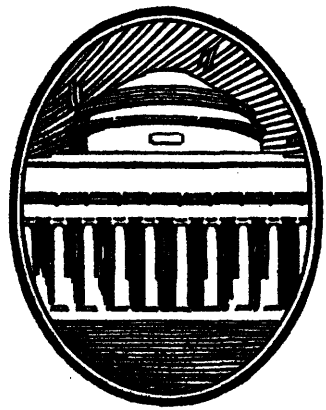
VOLUME 72 NUMBER 1



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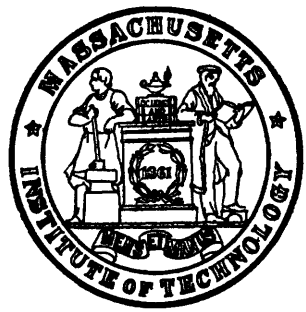
President's Report Issue

1935–1936

Covering period from meeting of Corporation October, 1935
to meeting of Corporation October, 1936



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REPORT OF THE PRESIDENT

TO THE MEMBERS OF THE CORPORATION:

It is my duty at this time to submit to you a report on the affairs of the Massachusetts Institute of Technology. The basic problems and welfare of the Institute cannot be considered except in relation to the general economic and social background of the country as a whole. The country is now in a period of transition from depression to at least relative prosperity — from the necessity of enforced contraction to the possibility of expansion and progress. This would imply also a transition period for the Institute, with a shift in the major emphasis of administrative efforts corresponding with the change in the general situation. I shall therefore follow an unusual outline in my report to you today, dividing it into three parts: (1) the year's operations; (2) review of the depression period; (3) the next period — a program of objectives.

THE YEAR'S OPERATIONS

Personnel. It is a source of much regret to me that each year, in reporting on the Personnel of Corporation and Faculty, I must report losses as well as gains.

The Corporation lost through death Mr. A. Farwell Bemis on April 11 and Mr. Henry A. Morss on May 6. Both had served the Institute in many capacities, including presidency of the Alumni Association, and both were ever generous in their active concern that the Institute render distinguished service to the public as well as to its students and alumni. Mr. Bemis was elected to the Corporation in 1914 and Mr. Morss in 1911, and the latter served nearly thirteen years as assistant treasurer and during 1934 served as acting treasurer. Resolutions on these men, who will be so acutely missed as friends and colleagues, are spread upon the minutes of the preceding meeting of this Corporation.

Dr. Francis H. Williams, beloved oldest member of the Corporation until last year when he resigned on account of age, died on June 22. Until prevented by failing health, he was

most loyal in attendance at Corporation meetings and in helpful concern with Institute affairs, and his last will and testament expressed this devotion.

Professor Thomson's health has not yet improved sufficiently to enable him to resume active duties, and his faithful attendance at Corporation and Executive Committee meetings has been much missed.

The Corporation has gained, through election to Life Membership, Messrs. Godfrey L. Cabot, William C. Potter and Philip Stockton; to Term Membership, Messrs. Frederick W. Garber, B. Edwin Hutchinson and William S. Newell. The retiring Term Members are Messrs. Thomas C. Desmond, Henry E. Worcester and Francis J. Chesterman.

The Faculty has lost through death, Associate Professor William A. Crosby of the Department of English and History on February 19, and Associate Professor Harry C. Bradley of the Division of Drawing on March 7.

Retirements for age at the close of the academic year are as follows: Professors Carroll W. Doten, Nathan R. George, George B. Haven, James R. Jack, Leonard M. Passano, Thomas Smith, all with the title "Professor Emeritus," and Director of Admissions James L. Tryon. Professor Jack remains this year in an honorary post as Curator of the Nautical Museum, and Dr. Tryon will do some visiting among preparatory schools and Alumni Clubs.

The following are new appointments to the Faculty: Frank M. Lewis, Professor of Marine Engineering; Major Kirke B. Lawton and Major Harold A. Nisley, Associate Professors of Military Science and Tactics; John M. Lessells, Associate Professor of Mechanical Engineering; Dr. Clifford B. Purves, Associate Professor of Organic Chemistry; Dr. W. Rupert Maclaurin, Assistant Professor of Economics, and Dr. Arthur R. von Hippel, Assistant Professor of Electrical Engineering.

Professor Henry H. W. Keith has been appointed Acting Head of the Department of Naval Architecture and Marine Engineering to replace Professor Jack.

Professor George R. Harrison has been placed in charge of work in Applied Physics, with the title "Director of Applied Physics"; Professor John W. M. Bunker has been given the

title "Director of the Research Laboratories of Biology"; and Professor B. Alden Thresher has been appointed Director of Admissions to succeed Professor Tryon.

Promotions are as follows: To the rank of Associate Professor: Jayson C. Balsbaugh, Roy W. Carlson, Ernest A. Guillemin, Louis Harris, Harold L. Hazen and Major James F. C. Hyde; to the rank of Assistant Professor: Wilmer L. Barrow, Alexander J. Bone, Edward M. Bridge, Samuel C. Collins, Prescott D. Crout, Edwin R. Gilliland, Edward S. Lamar, Albert A. Lawrence, Alvin Sloane, Theodore Smith, John G. Trump, Robert S. Woodbury, and Joseph T. Woodruff.

The Faculty has lost by resignation: Professor Oscar J. Gatchell, and Assistant Professors Frederick W. Adams, George A. Bicher, Charles M. Cooper, Robert L. Hershey, Eberhard Hopf, Paul W. Norton, Erik G. Rudberg and John H. Zimmerman.

Finances. There was an increase of over $15,000 in income from investments and student fees, as compared with the preceding year, bringing the total operating budget to $2,714,301. Capital and miscellaneous gifts totalled $429,533. The year's operations were closed with a small balance of $4,615 which was applied to reduce the cumulative deficit of the Institute to $16,314. The market value of endowment funds increased during the year, by additions and appreciation, from $32,562,000 to $36,530,000, and the yield, on market value, was 3.94 per cent; (on book value, 4.73 per cent).

It was again found possible to return to the members of the staff the entire amount of their contributions to the Salary Reserve Fund. The Salary Reserve Plan was reinstituted for the current year, but reserving at the rate of five per cent instead of ten per cent of salary. Since, however, the unappropriated balance in the year's operations now appears to be large enough to meet all reasonable expenses during the year, I am recommending to the Executive Committee that the Salary Reserve Plan be discontinued for the present.

Following a conference of the Finance Committee and invited financial advisors on October 28, 1935, the Institute's holdings in common stocks have been gradually increased to 41.2 per cent as of the close of the past fiscal year. A similar conference was held on September 10, 1936, and others are

planned for the near future, in order that the best possible consideration may be given to the determination of investment policy in these difficult times.

This year a change occurred in the personnel of the Finance Committee through the resignation of Mr. Francis R. Hart and the election of Mr. Philip Stockton to the chairmanship of this Committee. Mr. Hart completed twenty-nine years of the most devoted, able and successful administration of the financial affairs, first as treasurer of the Institute, and later as chairman of the Finance Committee. He resigned because his new duties as president of the United Fruit Company not only are a heavy drain on his time and strength, but they also involve the loss of his former intimate contact with investment matters which had been so helpful. His successor, Mr. Stockton, brings to the post an ability and enthusiasm which insure the best available care and wisdom in the handling of the Institute's investments.

Enrollment. The following table brings up to date the statistics of enrollment.

Enrollment at M. I. T.

(As of November 1)

	Total Undergraduate	Freshmen	Total Graduate	Total Enrollment
1930–31	2,670	734	539	3,209
1931–32	2,610	628	578	3,188
1932–33	2,308	562	523	2,831
1933–34	2,106	485	500	2,606
1934–35	2,009	542	498	2,507
1935–36	2,018	561	522	2,540
1936–37*	2,179	655	602	2,781

* Figures as of September 30, 1936.

It will be seen that last year's small upward trend in freshman enrollment has been accelerated and that there is a marked increase in the number of graduate students. The actual situation, however, is even more significant than these figures indicate. In the operation of the Plan of Stabilization of Enrollment, which was adopted last year and which is now in operation for the first time, approximately one hundred applicants for admission to the freshman class were refused admission

even though their qualifications would have insured them admission in previous years. In addition to these, there were some three hundred applications for admission which would not have met even the previous standards. The freshman class, therefore, represents the selection from more than one thousand applicants. There has thus been a twofold gain from the adoption of the stabilization plan: first, the quality of the incoming freshman class is notably improved (for example no students have been admitted with conditions); and second, had this plan not been in effect, the Institute would have experienced a serious lack of space and teaching staff with consequent detriment to its educational effectiveness.

During the year there were students from every State in the Union except three, from two Territories and Dependencies of the United States, and from thirty-five foreign countries. These figures refer to the citizenship of students; the distribution is still wider if birthplace or home is considered. In the United States, 1,877 students come from the North Atlantic States, including 1,088 from Massachusetts; 106 from the South Atlantic States, 51 from the South Central, 262 from the North Central, 101 from the West and 4 from Territories and Dependencies. There were enrolled at the Institute, mostly in the Graduate School, 614 graduates from 155 American colleges and from 48 foreign colleges. These figures give a picture of the remarkably widespread influence of the Institute. Incidentally, among the alumni, we find residents of 81 foreign countries.

Student Aid. There is very little difference in the amount of student aid at the Institute as shown in the comparative figures for 1934–35 and 1935–36 in the following table. There are, however, some interesting comments to be made.

Student Aid at M. I. T.

	1934–35		1935–36	
	Number	Amount	Number	Amount
Undergraduate Scholarships ..	423	$69,704	459	$72,226
Graduate Scholarships and Fellowships.....	276	92,750	280	89,150
Loans.....	402	152,656	329	124,567
Student Employment Service..	404	52,007*	596	67,012†

* Includes N. Y. A. payments of $17,828 † Includes N. Y. A. payments of $29,954

Following the policy reported last year of concentrating more of the undergraduate scholarship aid in the freshman year, leaving upper years to be taken care of by the Loan Fund, the amount for competitive and regional scholarships for freshmen has been increased to $40,825 as compared with $26,550 last year. These freshman scholarships have tended to improve the geographical distribution of entering students and have had a marked influence in stimulating the Institute alumni representatives in various localities to discover the best secondary school students in their communities and encourage them to come to the Institute.

The Loan Fund has operated with even greater success than was anticipated at the beginning, although the demands for loans at the present time are not as large as had been expected. Including loans made or authorized for the current academic year, the total sum is well in excess of $1,000,000. Repayments even through this difficult period have been so satisfactory as to indicate a reasonable expectation that about 94 per cent of the loans will be repaid. The remaining 6 per cent will be far more than made good by interest payments on outstanding loans and unloaned capital. For example, during the past year, interest received was more than four times the amount of repayments marked "past due." The requirements for loans during the current year will be provided by the interest and repayment on previous loans during the year, making it unnecessary to draw on the reserve. With the donations to the Loan Fund which have already been paid in or promised during the coming year, there appears to be a large enough fund to take care of all eventualities which may reasonably be expected, including possible increase of tuition, or in the number of loans requested to a considerably higher figure than any hitherto reached. In light of this experience, it seems unjustifiable to continue to build up the Fund for a possible demand which cannot reasonably be foreseen, and the Loan Fund Committee has therefore acted to close the fund as soon as the subscriptions due for the current year have all been received. The Loan Fund now stands at $1,472,560.

Matters of Policy. In my report last year I called attention to the desirability of selecting students of unusual promise and to our opportunity to make direct contribution

"to the advancement, development, and practical application of science." To these ends I submitted two recommendations: (1) the adoption of a plan of stabilization of enrollment 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 art, agriculture, manufacture, and commerce." During the year the first one of these recommendations has been put into effect, and as much progress has been made on the second as is reasonable to expect without the securing of substantially increased funds for the purpose.

After a careful study of the limitations of our existing facilities of space, equipment and staff, the Faculty and the Corporation approved a plan of stabilization of enrollment at a figure which will allow the admission of between 575 and 600 new freshmen for the years 1936–37 and 1937–38. The fact that the freshman class this fall is somewhat larger than the figure 600 is due in part to the fact that it includes some students who have previously been enrolled in the Institute and in part to the difficulties of predicting with sufficient accuracy the number of students who are admitted in advance of registration date, but who fail to register. Whether due to changed economic conditions or to the psychological influence of the stabilization plan, a larger number of those admitted has actually registered this fall than was the case in previous experience. Undoubtedly the Committee on Admissions will benefit by the additional experience and will be able next fall to admit a class more closely within the prescribed limits.

Some progress has been made in improving our facilities for research. A grant of $90,000 has been received from the Rockefeller Foundation for the construction of a new and greatly improved Differential Analyzer for the solution of difficult mathematical equations in scientific and engineering work. Financial assistance has been promised to enable the Department of Chemistry to institute an effective, forward-looking program of training and research in the field of Cellulose Chemistry, a field of growing importance in which the chemical industry is intensely interested. Research work for

industry under the jurisdiction of the Division of Industrial Coöperation continues to be of high caliber and of growing amount. A spectroscopic program of somewhat routine character but of mammoth extent is being supported by the FERA to the extent of $50,000 last year and $107,000 for the current year. This work, supervised by Professor Harrison, is providing physicists, astronomers and chemists the world over with a completely revised set of the wave-lengths of all the spectrum lines of all the chemical elements, from regions accessible only to the vacuum spectrograph through the ultra-violet and visible spectrum and out into the infra-red, and all with about ten times the accuracy of previous measurements. This is a program well worth carrying out, but not one which an educational institution would probably choose as a major objective because of the fact that there are exciting new discoveries and developments to which the attention of staff and students might better be devoted. It makes, however, an ideal piece of scientific work for the type of employee available under the government program and it is work the scientific value of which may well justify the investment which the Institute has made in its spectroscopic laboratory. This laboratory and automatic measuring and computing equipment, invented by Professor Harrison, make the Institute the only place in the world where such work could be carried out.

Many other interesting details of our research program I would like to discuss with you, but I must leave these for report under other circumstances. I will, however, later in my report, return to our educational and research program with some concrete suggestions as to those features to which, in my judgment, our attention should now be intensively directed.

There is one other major item of Institute policy on which much progress has been made during the year; *viz.*, that of handling inventions and patentable discoveries of members of the staff. For several years we have had a policy, approved by the Faculty and adopted by the Executive Committee, specifying the relationship between the staff member and the Institute in such matters, which has operated with almost perfect smoothness. However, there remains the very important question as to the Institute's responsibility, to the staff on the one hand and to the public on the other, for ensuring that these inven-

tions are handled in such manner as to be of maximum benefit. Since the public may best be served, in the long run, by the advantages accruing from an active and productive research program, we believe that on certain types of inventions it is legitimate to expect a profit to the Institute (with advantage also to the inventor) and that any income received by the Institute from such sources should be used to support further research work in the Institute.

Vice-President Bush and the Institute's Patent Committee, of which he is chairman, have given a great deal of thought during the year to determine the most effective and proper way to handle the various inventions and patents for which the Institute is now responsible and whose number is rapidly increasing. In this study the Committee has had frequent counsel with members of the Executive Committee and the Corporation who are particularly experienced in such matters. The Committee has also drawn largely on the experience of other agencies of a semi-altruistic character and is now prepared to recommend a definite organization for the handling of such patents as may be assigned to the Institute. Dean Bush will report later on this matter.

With this brief survey, I shall leave discussion of other features of the year's operations to my colleagues, the other administrative officers of the Institute, whose reports are appended hereto.

REVIEW OF THE DEPRESSION PERIOD

The depression brought about a decrease of nearly $400,000 in the operating income of the Institute, from $3,030,000 to $2,647,000. The student enrollment fell from 3,209 to 2,507 and the staff was decreased from 588 to 498. In spite of these losses and thanks to the whole-hearted coöperation of staff, alumni and Corporation, it can truly be said that the Institute emerges from the depression in a stronger position than when it entered.

Notable in the internal reorganization was the establishment, or rather the formal recognition, of the Schools of Architecture, Engineering and Science, together with the Graduate School, the Division of Humanities, and the Division of Industrial Coöperation. The appointment of an administrative head

to each of these schools and divisions has notably increased the administrative efficiency of the entire institution and the coöperation and harmony among its units. Similarly significant have been the revision in the curriculum and certain consolidations in courses and departments. The revision of the curriculum, begun under the late Dr. Stratton, has been continued throughout the entire undergraduate program of the Institute. As a result there is now a much simplified and better coördinated curriculum for the first two years, with better opportunities for students to become acquainted with the possibilities ahead before they are required to make their final choice of a special course. Elimination of certain duplications and improvements in the upper-class schedules have also been effected so that it can fairly be said that the curriculum as a whole is in an excellent condition. This does not mean that every aspect of it is yet in ideal shape or that continual attention to further revision will not be necessary, but it does mean that a major improvement has been effected and that concentrated attention need not be given to this matter for some time.

Included in the losses to the staff is unfortunately a considerable group of notable men who have done much to create the prestige of the Institute, but their replacements and other additions to the staff have been selected with the utmost care and I can say, unqualifiedly, with great success and cause for satisfaction. Despite the financial stringencies, the man power of the Institute is vigorously effective and in the words of one of my colleagues "the staff is going places."

The chief addition to the plant is the Eastman Research Laboratory for Chemistry and Physics, the cost of which was paid from a fund previously given by Mr. George Eastman for the erection of educational buildings when and if needed. In addition, even through the depression, there has been an attempt every year to provide at least some small addition or improvement of the Institute's physical plant. These improvements include the Barbour Field House, the Sailing Pavilion, sodding and planting of the yard, and the conversion of the older dormitory group into a well-furnished graduate house which has been one of the best investments, financially and educationally, which the Institute has made.

The value of the Technology Loan Fund during this

depression cannot be exaggerated for it has literally meant the saving of many excellent students, and at the same time it has permitted the Institute to retain on its staff many valuable members who otherwise would have had to be released for budgetary reasons. The Loan Fund Board, which administers the granting of loans and the collection of interest and repayment, has by experience worked out a very satisfactory technique, which, even during this trying period, has maintained the Fund on a truly revolving basis, so that its permanent success appears to be assured.

Increased attention has been given to the forming of proper contacts between the Institute and its alumni and the public generally. This has been done partly as an element of the educational program and in part as a frank effort to combat the effects of the depression on enrollment. One part of this program consisted in the appointment of 122 honorary secretaries in important centers in the United States and foreign countries. Serving as personal representatives of the Institute's administration these honorary secretaries have coöperated loyally and effectively in making local contacts with the press, schools, prospective students and their parents. At the same time the Alumni Clubs and their officers have coöperated splendidly in the same directions. The Director of Admissions, the President, and other officers of the Institute have made many visits to schools and Alumni Clubs throughout the country. On Saturday afternoons throughout the middle of the year, special educational demonstrations have been arranged for students and teachers from secondary schools within commuting distance from Boston. Some 20,000 attractive pictorial bulletins, describing the work of the Graduate School, of the undergraduate school, and of the School of Architecture, have been sent to fraternity houses, student members of honorary, professional and scientific societies, graduating students of high scholastic standing in colleges and universities, boy scout troop leaders, and many others. The President has written annually a personal letter to the 30,000 alumni of the Institute. All of this educational publicity has had an undoubted stimulating reaction, which is now being felt in the increased pressure for admission, and in the increasing prestige of the Institute and interest in its work on the part of the general public.

As to matters of internal policy, three achievements deserve special mention. By successive stages there has been worked out a general policy regarding the responsibility and attitude of a staff member to his Institute work, with particular relation to his outside interests, such as consulting or professional work not connected with Institute duties. For the present at least, this difficult problem appears to have an exceedingly satisfactory solution due, almost entirely, to the excellent spirit and coöperation on the part of members of the staff and their desire to place the welfare and reputation of the Institute above all personal considerations. The second important advance in policy has been the adoption of the plan for stabilization of enrollment, which is discussed elsewhere in the report; and the third is the adoption of a general policy with respect to patents and inventions which are developed by members of the Institute's staff. All three of these issues, which are important for the effective and harmonious operation of the Institute, have been brought to the present state through much thought, consultation and coöperation on the part of many people.

Perhaps the most striking feature of the Institute's record during the depression has been the fact that it has made no call on alumni for financial support, nor has it undertaken any fund-raising campaign. Its attitude has been that, during this time when its alumni and friends were having their own difficulties, it should make every possible effort to handle its own situation through careful administration and even if necessary through personal sacrifices by members of its organization. To do this, it has had to forego, for some five or six years, the active prosecution of many important projects which have long been contemplated or which have arisen during this period.

In my judgment, the future vigorous and healthy growth of the Institute depends upon the finding of some means whereby these intellectual babies, among which are undoubtedly embryonic developments of large importance in the future, may be nourished and developed to healthy maturity. The Institute is in somewhat the position of an athlete who has undergone a severe course of training and is now at the peak of condition to perform. In the following section of this report, I would outline those directions in which, in my judgment, the growth and increasing effectiveness of the Institute can most advantageously be extended.

THE NEXT PERIOD — A PROGRAM OF OBJECTIVES

With these things accomplished, it is now appropriate to look ahead, for I believe that we have come to the close of the time which should be characterized by almost exclusive attention to internal coördination and efficiency. To continue this particular line of effort would be to work on a program with diminishing returns. It seems clear to me that we should now pay active attention to meet the needs and opportunities with which we find ourselves confronted — needs and opportunities which have in part been disclosed by our intensive study in the past few years, in part have arisen through progress in science and engineering and in part have sprung from the creative work of our own staff. Some of these opportunities show such promise that their neglect would be no less than educational sabotage.

Plunging boldly and immediately to the heart of the matter, I present my considered estimate that a capital sum of $12,500,000 or its equivalent in annual income is the financial measure of those needs and opportunities which are so urgent, that delay in fulfilling them will cause real retrogression in the Institute's educational program. In addition to the specific items included in this estimate, there are others which are highly desirable but which cannot properly be described as critical needs.

In presenting such a program I am well aware that a convincing case must be made for it, if this Corporation is to be expected to give its approval and its coöperation in achieving the desired objectives. Through the studies made by its visiting committees, however, the Corporation is already informed of many urgent needs of the Institute, so that my task in presenting them is lightened. I realize also that there may be a real problem in making our case with those whose financial support we may seek, because of the prevalent opinion that ours is already a wealthy institution and supposedly, therefore, able to take care of its needs and opportunities. So, before entering upon a discussion of the details of the program which I shall submit to you, let me present first a general background.

In contrast with ordinary universities, the Institute's educational program involves intensive laboratory work in nearly every course. Its type of education is therefore inherently

more expensive than education of the ordinary collegiate grade. Furthermore, its established position of leadership in the field of scientific and technological education carries a definite responsibility for maintaining this position. This can only be done by maintaining a staff of such high quality, laboratories of such adequate equipment, and an active program of creative work of such value and distinction as to make this institution the place above all others to which a gifted student will wish to come for a type of training and inspiration which is unexcelled. Undoubtedly we could coast along for many years to come, with good enrollment and doing good work, on the basis of our present equipment and past reputation. To be content to do this, however, would lead inevitably and quickly to a position of reduced effectiveness and influence which would signalize the surrender of our birthright.

An increasing emphasis on postgraduate work is one of the reasons for the need of new facilities. Practically speaking, graduate work in engineering was almost negligible in the period before the erection of our present educational plant. Graduate work in science did exist but only to a small fraction of its present importance. The plant, conceived as it was with great generosity and remarkable vision, and in spite of additions, has nevertheless become inadequate to the demands now made upon it by increased enrollment, graduate work and research. This increase in postgraduate education and research is the Institute's answer, and is industry's demand to meet the problem of ever increasing technical specialization. Not only are students with postgraduate training more readily employable, but in some branches of engineering and nearly all branches of science it is now very difficult even to get a start in a career without such training. The Institute's leadership in the field of technological education therefore depends, in a very important manner, upon its leadership in postgraduate training and research.

There is still another general argument for the program which I propose. This rests upon the opportunity which this institution has to perform an exceedingly important type of public service after a manner which no institution has ever yet approached. Let me quote from my address last May before the Technology Club of New York.

"My belief in the possibility of an enhanced value of the Institute to the public is based on careful study of its potentialities of staff, equipment and organization. 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 closely knit, coöperating group with wider range of technical experience and approach than can be found probably in any other organization in the world. Because of the teaching program, therefore, this framework of a research organization is already provided. Reciprocally, a staff which is active and alert in handling the live problems of the technical professions is best able to steer its students, as apprentices, into these professions. 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 advanced students, and whose stimulating influence will permeate down into the undergraduate years.

Despite the splendid record of past accomplishment and the impressive current program of creative activities, it is a fact that we are not making full use of our opportunities. We are able to develop only a few of the promising ideas which are continually occurring to our staff, and those which we do develop we cannot handle efficiently because of a lack of facilities. We are in the situation of possessing a great reservoir of scientific discovery, invention and technical skill, without the relatively minor but essential subsidiary help required to exploit this reservoir. We are an organization which, because of its educational program, has all the overhead necessary for a great research program but which lacks the funds for operating expenses on a scale sufficient to utilize this overhead efficiently.

No educational institution in my knowledge has ever approached its possibilities for contributing to public welfare by giving attention to the efficiency of its research program comparable to that which it gives to its teaching. No institution has such great possibilities in this direction as the Massachusetts Institute of Technology. I can imagine no investment for public welfare so likely to secure large returns as one which would permit the latent creative powers of this Institution to become really active."

If the Massachusetts Institute of Technology will really

grapple with the opportunity here outlined, it will perform a new order of public service along the lines of its charter, which directs it to "aid(ing) generally by suitable means the advancement, development and practical application of science in connection with arts, agriculture, manufactures and commerce."

Let me turn now to some of the specific details of this program. It is comprised of two parts: the one having primarily to do with educational activities, and the other with student welfare. It would be a mistake, I think, to seek to further either one to the exclusion of the other. They are both necessary to the Institute's effective operation. Let me discuss the subject of student welfare first, because it is simplest.

STUDENT WELFARE

Dormitories. Well aware of the proper reluctance of the Corporation to put money into buildings unless need of them is really acute, I nevertheless believe that the present dormitory situation can almost be said to have reached that stage. At any rate I am convinced that an addition to the Institute's dormitory accommodations would be an asset in the educational process, a relief to the students, and would be economically justified. These are the facts:

Our three dormitory groups, with total capacity of 625, were filled just before the depression. During the early part of the depression, occupancy decreased until in 1932–33 there were as many as 74 vacancies. This was an economic loss and detrimental to morale. At this point the older dormitory group was converted into a Graduate House, well furnished with attractive appointments which would promote social intercourse between graduate students specializing in the various fields.

This plan was immediately successful and even at the point of lowest registration in 1934–35, the dormitories were again filled. The next year there was a waiting list of rather distressing proportions. This year every available room in the Graduate House has been engaged since last April and there was a disappointed waiting list of 123 at the opening of this fall term. Every one of these men could have been advantageously settled in a dormitory, if space had been available. When the

Institute opened, there was a waiting list of over 200 for the undergraduate dormitories, every room having been leased since before July 1. This undergraduate group will be somewhat reduced by transfer to fraternity houses and by withdrawals from the Institute, but a conservative estimate based on past experience indicates that, out of this 200 undergraduates, approximately 100 could be housed if accommodations were available. Taking these two groups together, it is evident that there is a present unsatisfied real demand of at least 200 students for dormitory rooms. We may reasonably expect this number to grow, rather than diminish, in the next few years, even though the plan of stabilization of enrollment is continued.

There is undoubted advantage in having a waiting list. This enhances the value of the dormitories in the eyes of the student body and strengthens the hands of those students and administrative officers who have responsibility for administering discipline in the dormitories. Nevertheless, I feel that we should be safe in providing dormitory accommodations for at least 100 more students.

To provide this dormitory accommodation would require an expenditure of about $500,000. At the present low rate of interest on invested funds I believe that the Corporation might well consider the advisability of putting $500,000 into a new dormitory, with the reasonable expectation of a net return from rental equal to the equivalent investment income.

Recreational and Extra-Curricular Activities. The desirability of an extension to the Walker Memorial and of a new gymnasium is so well recognized by every one in touch with student life that no defense of these items is needed. Seven years ago the students' Institute Committee, in coöperation with the Alumni Advisory Committees, made a careful study of the use of the Walker Memorial and the need for extension. The results were published in an article in *The Technology Review* in 1930. They called for additional office headquarters for student activities, additional space for dining service so that the present building could be more fully used as originally intended for social gathering and recreation, a little theater, and other features.

Our present gymnasium facilities, which consist of a small but good exercise room on the top floor of Walker Memorial

and a barnlike wooden relic of the temporary war buildings, are woefully inadequate. Not only do they fail to provide the facilities necessary for recreational enjoyment, but they present a most dismal picture of the Institute to the many visiting groups of athletes and sports enthusiasts. Among the many colleges and universities, large and small, of my own acquaintance I cannot recall any other which approaches this institution in the unattractiveness and inadequacy of its gymnasium. The only bright spot is the new Barbour Field House which contains lockers and showers for a limited group. An adequate gymnasium would not only provide for the recreational activities of the students and staff, but would also help to relieve the congestion of Walker Memorial by providing managerial office headquarters for the various undergraduate athletic activities. Its large drill or basketball floor could also be used on occasions as an auditorium, a facility which the Institute sadly lacks at present. The small gymnasium room on the top floor of the Walker Memorial could then be converted into a little theater or used for undergraduate activities or social purposes. I have recently appointed an informal committee, consisting of Mr. Henry E. Worcester as chairman, together with Mr. Ralph Jope, secretary of the Advisory Committee on Athletics, and Professor Walter C. Voss of the Department of Building Construction to make a study of our needs in this field and of the best practice which has been followed in gymnasiums recently constructed for student bodies of the same general size as ours.

My recommendations would be that we estimate that $1,000,000 will be required to provide one or the other of these two facilities for student welfare and that a careful study be made to determine which of the two is most urgent. I do not believe that we would be justified at this time in attempting to provide *both* the extension to Walker Memorial and a new gymnasium in view of the additional demands for funds which will be described in the following outline of the needs of our educational program.

EDUCATIONAL PROGRAM

Above any other need of our educational program I would place the need of fluid funds for research, not permanently assigned to any particular field of architecture, science or engi-

neering, but free for use as opportunity offers to aid the development of ideas and programs of unusual promise as they arise. The grant of $170,000 from the Rockefeller Foundation, spread over a six-year period, gave an illustration of the great value of a fund of this type. Three hundred and eight scientific publications have already come out of the research made possible by this grant, and probably 200 more are still to come. It is in no inconsiderable degree that this fund is responsible for the enhanced prestige and valuable output of research from our scientific departments during the last few years. I should like to mention in more detail some of the most important research projects which are now dependent on additional funds for their prosecution, but I shall postpone this until the other items have been presented.

Fellowships. We need $60,000 a year for additional fellowships of special types. I should not wish to base this need on the competition between institutions for students and particularly graduate students of the very highest ability, although this is one factor in the situation. Ideally we should draw these students, not by fellowships, but by offering an educational opportunity so fine that the students will come to take advantage of it, if they can; and the Technology Loan Fund will help them. It is a practical fact, however, that a fellowship program, wisely administered, can be a most significant educational asset. Some of our sister institutions have inaugurated exceptional fellowship programs with excellent results. For example, we recall the new fellowship program instituted at Harvard University and, earlier, the fine group of fellowships at Princeton University which was in no small part responsible for Dean West's success in building there a graduate school of first rank.

Fellowships, however, should not be looked upon as a means of purchasing or subsidizing students or of building up the scholastic team by methods which, so it is said, are sometimes employed for the recruiting of athletes. Rather should fellowships be considered primarily as prizes and incentives, or as providing opportunity for study and investigation of problems of exceptional interest. The winner of a fellowship is encouraged and assisted along his professional career. The fellowship system creates in the minds of students and the pub-

lic generally a high appreciation of scholarship. The Institute is fortunate in having some half dozen fellowships which carry more than a portion of the tuition charge and which are of the distinguished character desired, but this number should be largely increased.

Let me outline specific educational uses to which we propose to assign these new fellowships, if they can be secured.

(1) A considerable portion of our elementary teaching and laboratory program can most advantageously be carried on by young instructors under experienced supervision. By and large the ablest, most alert and most effective young men whom we can find for such teaching work are men who, at the same time, wish to pursue their advanced studies and research toward a doctor's degree. Their appointment as half-time teachers has many advantages. As a rule they are decidedly successful in their teaching work and laboratory supervision and they gain valuable experience in crystallizing their scientific concepts and they acquire poise and confidence. Their teaching has a freshness and enthusiasm which reacts well on the students. At the same time the plan enables these men partially to finance their postgraduate studies — an important item since they have so recently faced the expense of undergraduate education.

There are, however, some difficulties inherent in the present half-time instructor's plan. The teaching and laboratory instruction which they are called on to do is of a rather routine nature, and after two or three years it is likely to lose its appeal, with the result that the teaching work is not then done so satisfactorily. At the same time the young man is becoming intensely involved in research underlying his thesis, and finds teaching work difficult to carry on simultaneously with the proper care and enthusiasm. And if this plan of combined teaching and graduate study is continued to the doctorate, five or six years are generally required — too long a period from a young man's life at this stage, if some more satisfactory method can be found.

We believe that a more satisfactory method can be found for securing even more desirable men for these posts and for alleviating the difficulties which I have mentioned. It is proposed that the most promising of these men, who have held part-time teaching, part-time graduate student positions for

two or three years, be awarded fellowships for the last year of their work for the doctorate. These fellowships should be large enough to meet approximately the necessary expenses for the year's study, so that this selected group of men may devote their last year to complete concentration on their study and research. The direct and indirect results of such a plan would all be excellent, first in securing the best personnel, and then in the training of these graduate students and in their teaching or laboratory supervision of undergraduates.

(2) A second type of fellowship is desired for students who have taken their degree, master's or doctor's as the case may be, and who have become involved in some investigation of such interest and promise that it becomes a pity to detach them from the work at this incomplete stage. Such detachment means an hiatus or perhaps a cessation in the investigation and at the same time it deprives the student of the benefit, satisfaction and prestige which he would gain from carrying the work through to completion. It is proposed, therefore, to make available a certain number of research fellowships, for assignment as occasion warrants, to permit some of our best students to continue work on some of the most important research projects in our program for a year following their award of a master's or doctor's degree.

(3) A third type of fellowship is desired to extend and place on a more permanent basis the system of honorary sponsored fellowships which has been given a decidedly successful trial on a small scale in the Department of Business and Engineering Administration. Two ideas are basic to these fellowships, the one having to do with the selection of the fellows, and the other with the educational program made available to them. The fellows are selected from business and industrial organizations with coöperation of the management, and are preferably from two to five years out of college. Thus an exceedingly promising young employee is given leave of absence for one year by his employer in order to carry on, under the fellowship, advanced study of business and engineering administration leading to a master's degree at the Institute. While here, he is not only given the best program of study which the Institute can offer, but at the same time he is given an opportunity to make personal contact with a considerable number of

the most interesting and successful business executives, through a well developed program of social gatherings and small group discussions.

This plan carries into the training of young men for business positions something of the same advantageous experience gained by the young doctor or the young lawyer in his period of interneship or apprenticeship, when he has opportunity to observe the work of the best men in his profession. Hitherto such an advantage has not been given the young apprentice in a business organization, since he commonly comes early into contact only with the lower grade business executives. The experiences of the small group of honorary fellows during the past five years and their very remarkable record of success immediately following their fellowship year are ample evidence of the soundness of this educational program. Funds for fellowships are essential, however, since the young men who can most benefit by this program are in general unable at this critical stage in their careers to make the combined sacrifice of loss of earnings for a year and payment of tuition. These fellowships are believed to be good educational investments in the men, and an educational experiment worth carrying out. If properly financed, the plan may well rival, influence and value, such outstanding fellowship programs as the Commonwealth Guggenheim or National Research Fellowships or the Rhodes Scholarships. Its trial on a small scale at the Institute has aroused a good deal of interest in America and in England among groups concerned with the future of management in business and industry.

(4) Finally, as a supplement to our existing undergraduate scholarship and loan plan, I would recommend the addition of a limited number of prize scholarships open to students in the senior year. These should carry something more than full tuition, as, for example, $750 each. Since the Loan Fund has been open practically only to men above the freshman year, the Institute has been gradually shifting awards from undergraduate scholarship funds into the lower years. In particular, the number of Freshman Competitive Scholarships and Regional Scholarships has been greatly increased as a means of drawing desirable students from all parts of the country and of stimulating our alumni representatives to exert their best efforts in

steering desirable student material to the Institute. Thus the funds remaining for scholarship awards in the upper undergraduate years are considerably reduced. It is true that the Loan Fund is quite ample to take care of cases of necessity, as far as tuition is concerned. The best educational practice, however, should supplement this with scholarship awards made definitely as incentives and prizes to scholastic work of very high order, and I believe that our educational process would be definitely improved if a few undergraduate scholarships of a more outstanding type were provided.

To put this entire fellowship and scholarship program into effect would require annually at least $60,000 or the income from a capital investment of $1,500,000.

Wind Tunnel. Airplane speeds have increased so rapidly that the Institute's wind tunnel, built in 1923, is already obsolete except for instructional and a limited number of experimental purposes. The wind velocity and size of models which can be employed in this tunnel fall below the useful range for studying and designing present day airplanes, and the degree of obsolescence will rapidly increase. The Institute had the first course in Aeronautical Engineering in America, and the first wind tunnel; it has a notable record of achievement and an able staff in this field. Lack of this modern facility should not be allowed to relegate the department to an inferior and less effective position.

Outside of the government wind tunnels at Langley Field the only wind tunnel in the United States which is now useful in modern airplane design is the one at the California Institute of Technology, which was used in the development of the Douglas airplane. Eastern airplane and propeller manufacturers are eager to have a satisfactory wind tunnel on the east coast and have promised to assist in supporting the operation of such a wind tunnel by contract for experimental work with suitable provision for overhead charges.

A unique design of wind tunnel is planned, which will gain the advantages of a very large tunnel with enormous wind velocity through the expedient of operating at an adjustable air pressure within the tunnel. By this means the cost of a satisfactory tunnel can be brought down to $125,000. Aided by the vigorous study and report of last year's Visiting Committee

for the Department of Aeronautical Engineering, pledges have been received for a substantial portion of the cost of this wind tunnel and it is hoped that the balance of the fund may be secured during the current year.

Towing Tank. In a somewhat analogous category with the wind tunnel is the need of a model towing tank for the Department of Naval Architecture and Marine Engineering. This has long been a subject of intense interest to the Institute, dating back at least to the time when the late President Stratton and John R. Freeman made intensive studies and preparations for the installation of a combined hydraulic laboratory and towing tank. Unfortunately circumstances have thus far prevented the consummation of their well-laid plans.

Much of the most valuable recent work on hull design of ships and in the scientific study of the phenomena of ships afloat has been done with the aid of towing tanks which are much smaller and less expensive than the tank which was recently projected for the Institute. Encouraged by this fact, and convinced that a department of naval architecture and marine engineering so prominent as the Institute's should not be handicapped by lack of this essential piece of equipment for teaching and research, favorable consideration has recently been given to the advantages which would be offered by a small tank costing perhaps $35,000. Such a tank would involve only a small maintenance and operating cost, and might be located either in the basement of the Pratt building for naval architecture, or perhaps in the place of the present wind tunnel if the new one is secured.

In view of the Institute's increased responsibility in the training of naval constructors, who now spend all three years of their postgraduate work at the Institute, and in view of the general tendency to give more scientific attention to ship design, I recommend that steps be taken to secure the relatively small fund necessary to provide a naval towing tank.

High Voltage Laboratory. Significant opportunities would be opened up in our teaching and research program by the provision of suitable facilities for experimental and developmental work in the field of high voltage electricity. In this, both the Electrical Engineering and Physics Departments are intensely interested. There are definite industrial trends

toward the use of ever higher voltage; there are many important practical problems to be solved and a great virgin field for scientific and industrial pioneering. The physicist is especially interested in the use of high voltage to explore the inner nuclei of atoms — those tiny citadels which for centuries withstood the efforts of the alchemists. This new field may well prove to be as far-reaching in its scientific and practical influence as were those fields which were opened up by the discovery of the electron a generation ago. The Institute is now in the unique position of having on its staff probably the most competent men in the world in fundamental aspects of the high voltage field, and it is also in the position of having developed the equipment for producing direct current of ten times higher voltage than any which has hitherto been achieved. All of this opens up a very large field for research and for thesis work by graduate students, provided the necessary facilities can be secured.

Most of the high voltage development in the Department of Physics has been carried out in the airship dock on the estate of the late Colonel E. H. R. Green of South Dartmouth. Without the facilities there placed at the Institute's disposal this development would have been impossible, and the Institute is exceedingly grateful to Colonel Green for his having given the opportunity to carry on this experimental work on his estate. Now, however, the work has been carried to the point of practically demonstrated importance. In the interest of the most rapid prosecution of the work and of its best contribution to the Institute's educational program, it is important that opportunity to participate in this work be also made available to other members of the staff and to graduate students, this being impossible unless a high voltage laboratory be erected at the Institute. The Electrical Engineering Department would also find much use for the same equipment, but it would also be interested in high voltage equipment of a somewhat different type, for the study of transient and variable electrical phenomena.

The two closely related programs of physics and electrical engineering should be prosecuted with as much speed and energy as possible since world-wide interest and activity have been aroused in these subjects and the Institute has an excellent opportunity to take a leading position in their development.

It will be of interest briefly to mention some of the uses to which a suitable high voltage laboratory with funds for operation could be put. Most important on the scientific side is the use of electrified particles, speeded up by high voltage, to investigate the internal structure of atoms. By such means atomic transformations, such as the alchemists sought for centuries, can be affected. It has already been proved that some of these transformations may have practical as well as scientific importance. Only a beginning has been made in the exploration of this field and the most recent results indicate that, at the highest voltages now accessible, an entirely new order of phenomena is observed. On the engineering side the most interesting problem has to do with the possibility of transmitting electric power economically over much larger distances than those which are now possible. The economic advantages of this, if successful, are enormous. It is entirely premature to say that the ideas which have thus far been evolved will be successful, but I think it can be said with certainty that in the program now outlined many valuable practical results will be obtained.

Among the other important aspects of this work are the following: investigation into the nature of the failure of electrical insulation and the securing of new knowledge regarding the atomic structure of insulation; investigation of the nature of lightning and thunder storms, and practical means of protection from lightning; use of high voltage for medical and physiological purposes, such as the new X-ray machine which is being installed in the Huntington Memorial Hospital (a direct outgrowth of M. I. T.'s high voltage program) and the production of artificial radium, of a type which can safely be absorbed into the system in food or injected, and used either for therapeutic purposes or for a variety of physiological studies.

While the estimates are not yet complete, it appears that a reasonably active prosecution of this program will require the construction of some $340,000 worth of buildings and equipment and an annual operating budget of $50,000, or the income from $1,250,000. This figure, while large, is exceedingly small in relation to the value of some of the industrial possibilities in the high voltage program.

Biological Engineering. We suggest the name of Biological Engineering because, whenever the practical applica-

tions of a science develop to the point at which there is a systematic method for applying the science to practical problems, we call this a branch of engineering. Within the memory of our staff, a certain technique of applying chemistry and engineering to industrial problems led to the creation at the Institute of a new art, chemical engineering, which has become one of the most active and important branches of applied science. I would suggest that the same success and development may well follow a strong attempt to center here a practical approach to biological and medical problems, involving the coöperative effort of biologists, physicists, chemists and engineers, and coördinating the background of interest in these fields which we now find, partly for historical reasons and partly from natural development, throughout the Institute.

The need is for a laboratory costing, with equipment, about $750,000, together with some $80,000, or the income from $2,000,000, for annual support of operations. One purpose of this income is to provide additional members of the staff who are leaders in various aspects of biophysics, biochemistry and food technology, and a small group of expert chemists, physicists and engineers selected to work in this field. The laboratory might well be named the "Sedgwick Memorial Laboratory," and a start has been made by admirers and former colleagues of Professor Sedgwick to raise funds for some memorial to him.

The rather desperate crowding of the existing educational buildings is an additional argument for the proposed new building. Since the early 1920's, the number of undergraduate students in biology has increased fourfold and the number of graduate students tenfold, with almost no opportunity for expansion of quarters. The Department of Biology and Public Health has probably become the most congested and inadequately housed department in the Institution. If, however, it could be moved to new quarters, the Electrical Engineering Department, which is one of the other two most crowded departments, could immediately expand into the quarters vacated and there would be a reduction all along the line of pressure for space.

To show the significance of the proposed name, Biological Engineering, and the possibilities inherent in a laboratory with

adequate financial support in this field, let me give a little sketch of the background:

The Institute has an excellent tradition of effective work in applied biology carried on continuously from the pioneering work of the late Professor Sedgwick in 1883–87, who took the lead in directing biological and bacteriological work into the fields of water and milk supplies, sewage treatment and disposal and other aspects of public health. Under his leadership the department actually became the first school of public health. In fact he was so much the pioneer in the applications of bacteriology to public health as to have been called "the American Pasteur." Here also was established the first course in Sanitary Engineering in America. From these beginnings there has been constant growth, so that the Institute's program at the present time includes many aspects of public health education, public health administration and public health engineering, and sanitary engineering.

There are, however, other important applications of biology, such as those in industry and agriculture. Here again the Institute did pioneering work, being the first to offer courses in industrial biology and food technology. At the present time the Institute's program therefore includes instruction and research in industrial biology, including food technology, the important industrial fermentations, the development and use of disinfectants, the action of mildews, ferments and enzymes on textiles, foods and plants. Work in biochemistry is developing rapidly and has led to important results in the study of vitamins and light therapy. All these subjects are peculiarly appropriate for an institution like M. I. T., with its wide industrial contacts, because they frequently raise problems requiring coöperative effort of chemists, physicists, metallurgists, electrical or mechanical engineers, all of which the Institute can supply.

In addition to these established fields of applied biology, experience shows a rapidly increasing number of interesting and potentially important new investigations which are springing up in all departments of the Institute, but which have primarily biological significance.

For example, in the Physics Department there has been developed a greatly improved technique for detection and

measurement of radium poisoning and, in collaboration with Dr. Aub of the Harvard Medical School, there has been worked out a successful method of treatment of this hitherto incurable disease — a disease which is more prevalent than is generally believed, not only as an industrial poisoning, but also as one threatening the addicts of radium nostrum waters whose dangers have not been sufficiently realized. Also, in collaboration with the Biology Department, there is an investigation of the conditions under which cancer of the bone may develop. There is also an interesting study of the action of high-speed electrons on spores and other living cells, a study which may have practical applications as well as interesting scientific results as a means of producing mutations or new species, or of producing physiological changes in organisms. The Institute's spectroscopy laboratory is perfecting a method for detecting danger of selenium poisoning of western livestock, is coöperating with the Harvard Medical School in a study of the cause and diagnosis of anaemia in children, and is generally stimulating the applications of the spectroscope in medicine. At an early date the high voltage group in the Physics Department will be in a position to produce usable quantities of harmless artificial radium and this will immediately open the way to a most interesting program of physiological investigations which may well be centered in the Biology Department and involve coöperation of local hospitals.

As an outcome of work instigated in the Biological Department, the Department of Chemistry has been doing some exceedingly important research to produce new organic compounds which have medical value. These include new antiseptics and germicides, new and improved forms of vitamins, and synthetic sex hormones. This work also is carried on in close collaboration with the Biology Department, which conducts the necessary biological tests of the materials developed.

The Electrical Engineering Department recently designed an improved form of sensitive cardiograph which has been installed in one of the Boston hospitals, and is also conducting an extremely interesting investigation of the resistance and reactance of various tissues of the human body. These latter studies show rather striking characteristics whose medical significance, as to correlation with various types of disease or

bodily condition tissues, are being extensively investigated through the coöperation of hospitals and clinics in Boston. In this department also was designed the new type of 1,000,000-volt generator and X-ray outfit for experimentation and treatment of deep-seated cancer at the Huntington Memorial Hospital, announced two weeks ago to the American Society of Roentgenologists. A joint project involving the Departments of Mechanical Engineering and Biology and Public Health is a fundamental study of air conditioning, in which the objective is to find those conditions which are most favorable to proper physiological action. These are only some current examples of a program of applied biology which, for the most part, fall under the heading of Biophysics or Biochemistry, or more generally Biophysical Science.

Now it has been generally agreed by scientists that the biophysical and biochemical approach to biological and medical problems is one which offers tremendous possibility. In fact it is probable that this line of approach is the one most likely to lead to a fundamental understanding of the complex problems here involved. Attempts have been made to establish centers for biophysical and biochemical research with some success but on the whole progress has been rather disappointingly slow. I believe that there is much promise in a type of approach to applied biology which could be carried out in the environment of the Institute, with its biology department free to call for advice on a wider variety of scientific and engineering specialists than can be found in any other institution in the world, with the constant feeding in of new ideas from all these sources, and with the friendly coöperation, as occasion arises, of the splendid hospitals and medical schools in the vicinity. The plan calls for an adequate laboratory and a strategically chosen staff of biologists, chemists and physicists working within the larger group of the whole Institute. Nothing like this has ever been done. The environment and a good basis of interest and accomplishment are already provided. The subject is the most important of all branches of applied science. I therefore urge that an earnest attempt be made to put this entire program on a vigorously operating basis.

Fluid Research Fund. I have already expressed my

judgment that the most important need of the Institute is at least $200,000 a year annually, or a capital endowment of $5,000,000 to provide a fund for research, which may be allocated to the support of various important research projects or programs as they arise. The Rockefeller Fund of $170,000 during the past six years has furnished on a limited scale a striking example of what can be accomplished with this type of assistance. In support of these statements I shall mention very briefly a few examples of the type of research which could be made very effective with such support — effective not only as regards value of the results obtained but also as examples and exercises in the training of the more advanced students.

The Institute's staff in Physical Chemistry has opened up a far-reaching program of research at low temperatures. Even before the depression the Executive Committee had tentatively approved the erection of a cryogenic laboratory for this work, but the plan was postponed with the onset of financial difficulties. In the meantime, Professor Keyes has invented a new method of producing low temperatures which makes unnecessary the special building with high pressure pumps and containers, which have always been assumed to be the necessary equipment for low temperature work. The new developments make low temperature investigation accessible in an ordinary laboratory, and it is therefore highly desirable that funds should be secured which will permit the necessary apparatus to be constructed, and work to be carried on with it in its almost unlimited range of applications to scientific and industrial problems. This program of cryogenic research should supply important working problems for the group of physical chemists for many years to come. It is therefore a good successor for that nearly completed program of research on properties of steam at high pressures and temperatures, which has been one of the principal concerns of the Physical Chemistry group for the last decade.

Also of large scientific and practical interest is the production of very powerful magnetic fields throughout a considerable volume of space. New knowledge of the physical nature of matter in its solid state, with applications in electrical and mechanical engineering, and also many uses in the

fields of Chemistry and Spectroscopy are all made possible with magnetic fields of this type. In the Department of Mining and Metallurgy, with the aid of electric power facilities generously provided by the Boston Edison Company, there has just been developed an electromagnetic coil which will produce, in large volume, steady magnetic fields several times larger than any which have hitherto been achieved. This opens the way for a large amount of experimentation in many directions in almost virgin fields. To carry on this work, however, requires a more powerful source of electric current than the Institute has available from its present power plant, and which the Boston Edison Company cannot be expected to supply permanently after the preliminary developmental work is past. There is here an opportunity to carry on work for which undoubtedly millions of dollars have been expended in preparation and previous attempts the world over.

In this age of concrete construction, it is highly important to give a proper opportunity to the Institute's expert staff to carry on engineering developments and scientific studies of concrete and cement. On the Institute's staff are at least two outstanding authorities in this country on fundamental aspects of concrete and similar materials. They could take the lead in an exceedingly useful scientific and developmental program if funds were available.

The whole subject of housing and building construction is certainly one of rapidly increasing interest and importance. The Institute has a course in building construction, one in architectural engineering, and groups in its Departments of Economics and Civil and Mechanical Engineering which are interested in the subject. None of these groups have had an opportunity to do much beyond the routine instruction in the subject. To be really effective in this instruction and to perform a service which the Institute, with its varied facilities, might bring to bear on this important problem, it is highly important that means be found to permit a more active research program in the economics of construction and the technical aspects of materials and methods.

The meteorological activities of the Institute need, and richly deserve, additional support of research. The work of this department has probably been the strongest influence in

this country recently leading to the introduction of new methods of weather forecasting in the United States Weather Bureau. It has trained most of the young men who have recently been taken onto the Weather Bureau staff to assist in putting this new program into effect. It is engaged in most interesting studies of the relations between wind and ocean currents and the nature of hurricanes. The scientific spirit of its work is carried back each year to the Weather Bureau, the Army and the Navy by the young men of those organizations, who are trained here.

Another great national problem which is becoming of increasing importance, and in which the Institute should be forehanded, is the problem of finding industrial uses for agricultural products. This might well enter more largely into the Institute's program in Applied Physics and Organic Chemistry. As a matter of fact the Chemistry Department is now instituting a special program for the training of cellulose chemists, so urgently desired by the chemical industry. For the time being the Chemical Foundation is undertaking to secure funds to support this particular educational and research program at the Institute, but, if it develops as expected, the Institute must soon incorporate the work into its own program.

These are only a few outstanding examples of the needs and opportunities in the Institute's research program. They are each projects which may well involve considerable groups of men. In addition, however, there are many other such group programs as well as individual investigations. Every graduating senior, every candidate for a master's degree, every candidate for a doctor's degree, carries on some type of investigation. The increasing importance and the great educational value of all this work is my reason for placing a fluid research fund at the forefront of the larger program which is here presented.

SUMMARY

This entire program adds up to a capital expenditure of $2,750,000 for buildings and equipment, and also an annual income of $390,000 which, if also capitalized, would make the figure for the entire program $12,500,000. The details are summarized in the following list:

Educational Program		
Fluid Research Funds, annually	$200,000	
Fellowships, annually	60,000	
Biological Engineering operations, annually	80,000	
Biological Engineering laboratory and equipment		$750,000
High Voltage Program laboratory and equipment		340,000
High Voltage Program operations, annually	50,000	
Wind Tunnel		125,000
Naval Towing Tank		35,000
Student Welfare		
Dormitory for 100 men		500,000
Gymnasium, *or* Extension to Walker Memorial		1,000,000
Total annually	$390,000	
Total capital		$2,750,000
To capitalize the entire program		$12,500,000

ADDENDA

This program does not include a number of other items which are highly desirable but which cannot properly be called emergency needs. In order that you may have a complete picture I will mention these additional items very briefly.

1. An attempt has frequently been urged to secure endowed professorships of a distinguished nature named after Richard C. Maclaurin, Elihu Thomson and William T. Sedgwick. We have no memorial named for Dr. Maclaurin. It has been suggested that any attempt to provide such a memorial await the time at which alumni who were at the Institute during his presidency shall have reached the age of prospective donors. This time would now seem to have been reached and the next year or two would be peculiarly appropriate for endowing such a professorship, in view of the early appearance of Dr. Maclaurin's biography, written by Professor Pearson. There has already been received a gift toward the Elihu Thomson professorship from his late colleague and life-long friend, Dr. E. B. Rice, formerly President of the General Electric Company. There also exists a William T. Sedgwick fund from the estate of his widow, with later additions, which would be

suitable to apply either toward the endowment of a professorship or the erection of a laboratory as a memorial.

2. An adequate hydraulics laboratory would be a very strategic addition to the Institute's equipment for civil and mechanical engineering. This need and opportunity have been keenly felt for many years. The increasing activity in flood control and large power or storage developments points to increasing importance of fundamental scientific work in hydraulics. In the opinion of experts the time is coming when no major project of a hydraulic nature will be designed without careful preliminary model studies.

3. Current economic theory is unsatisfactory and is based on classical principles which were annunciated before the impact of the modern industrial age, which is responsible for the major portion of our economic advantages and difficulties. Professor Jackson has proposed an interesting program for developing a new approach to the study of economic forces and trends, from the standpoint of the engineer who is primarily responsible for the problems involved. It would be a highly interesting and, no doubt, fruitful experiment to undertake Professor Jackson's program for a trial period of at least five years.

4. In view of the fact that the Institute's charter calls for a museum of arts, and in view of the undoubted value of a museum of science and industrial art for the enlightenment of the community and the educational experience to the students, thought has been given to means for providing this feature at the Institute in an economical and effective manner. To this end interesting exhibits are gradually being set up along the walls of the Institute's three miles of corridor space, where they are easily accessible to students and visitors. Funds are needed to expedite this development and to secure some particularly valuable exhibition features whose acquirement now appears to be a possibility.

CONCLUSION

Such, gentlemen, is the program of needs and opportunities which I present for your approval. The magnitude of the funds involved in the individual items is somewhat arbitrary, but in every case represents a conservative estimate

of the amount which could advantageously be used. Barring what is best described as "an act of God" it is realized that a sum of this magnitude cannot be secured at once. It would seem to me unwise to attempt to achieve all these objectives by anything like a whirlwind drive. If we are to attempt them, however, it should be done vigorously and with expectation of success within a few years. I should not advocate the organization of a campaign to raise these funds within a specified date, but rather an organized, active and sustained effort to secure them by bringing the program to the attention of alumni and friends of the Institute and philanthropists who are interested in the objectives here set forth.

I hope, therefore, that this Corporation will express its general approval of the program and its authorization to the Executive Committee and President to take suitable steps in an effort to secure the facilities and funds required to meet the needs and opportunities that have been described. Such approval should also imply willingness of the Corporation, individually and collectively, to assist in such ways as may be proper and possible; for a program of this type probably can not be carried through successfully by the efforts of one individual or one small committee, but will require the enthusiastic and active support of the Corporation, staff, alumni, and friends of the Institute generally.

If, therefore, in your judgment the program of objectives is sound and the time is at least reasonably propitious for an attempt to undertake it, I would ask, following the customary vote to accept the President's Report, that you then take such action as seems proper to you on the recommendations which I have made.

Respectfully submitted,

KARL T. COMPTON.

REPORTS OF ADMINISTRATIVE OFFICERS

Dean of Students. As mentioned at the close of last year's Report, the spring of 1935 saw undertaken by a committee of the Faculty the first intensive study of the problem of the Institute's enrollment. Its objective was to formulate a plan whereby the wide fluctuations, particularly in the numbers of freshmen, which have occurred since the War, might be minimized. During 1935–36 this committee submitted two progress reports, the first making recommendations as to regulating the size of the next two entering classes, and the second as to the number of sophomores to be permitted to continue beyond the midyear examination period in each of the several courses. All of the recommendations were adopted by a unanimous vote of the Faculty.

For 1936–37 and 1937–38, therefore, the number of first-year students admitted is to fall between the limits of 575 and 600; and, similarly, a stabilization range is prescribed for the number of second-year students allowed to continue in each course after midyears. If not excluded from the Institute by reason of the Scholastic Rating System, a sophomore, barred from continuance in a particular course due to its stabilization procedure, may change to some less crowded course, or temporarily, for not more than two successive terms, assume "unclassified" status.

In administering these selective processes, and particularly in the choice of men to be admitted to the Institute as first-year students, the committee emphasized its conviction that increasing emphasis should be placed upon a candidate's non-academic qualifications. In its report to the Faculty the committee fixed the 575–600 range for the Classes of 1940 and 1941 on seven main premises:

"(1) That neither space nor staff should be overcrowded; that the Institute must offer the best to freshmen if they are to be induced to meet the necessarily high tuition and other expenses compared with other schools.

"(2) That, however, space and staff should be worked at a comfortable 100 per cent capacity.

"(3) That freshman numbers should not be allowed to fluctuate much from year to year; that increases should be gradual in order that decreases may likewise be minimized when the tide turns.

"(4) That the size of a freshman class should be determined as far ahead as possible, at least one and preferably two years.

"(5) That it is best to have a situation where the supply of academically qualified applicants is somewhat in excess of the numbers which will fulfill (1) to (4) above.

"(6) That we should aim to admit as high a proportion as possible of men potentially qualified to become leaders in the careers for which the Institute offers preparation. To this end we should give weight not solely to scholastic capacity, but also to personal qualities making for all-round effectiveness, such as imagination, adaptability, resourcefulness, dependability and coöperativeness. The importance of such qualities is so great that we should attempt to evaluate them to the best of our ability, even though precise measurement is impossible. Marked deficiency in such personal qualities should be outweighed only by special intellectual ability of an exceptional order.

"(7) That it is desirable to give a definite answer on the admissibility of a candidate as soon as possible after the application is filed."

To make the final three of these premises more effective the committee recommended that every possible means should be exerted to strengthen our *personal* contacts with secondary school officials, honorary secretaries and alumni club officers. It is upon these individuals that more reliance must be placed as admission to the Institute becomes more selective.

Experience obtained in the admission of candidates by the "highest fifth" plan without examination, a method by which over two-thirds of our freshmen now enter, has amply demonstrated that secondary school officials can usually estimate with considerable accuracy the ability of their candidates to carry on with success at the Institute. Experience has also shown that honorary secretaries and alumni club officers can, by interviews and other means, obtain data of great utility in judging an applicant.

School and alumni officials must, however, be kept informed of the changes constantly taking place in our various curricula and of the Institute's ever expanding aims and purposes. This, as the committee pointed out, cannot be done entirely through bulletins and correspondence. During 1935–36, therefore, an attempt has been made to increase the frequency of visits by members of the staff to the schools from which many of our freshmen derive, and to alumni centers, such as those having Regional Scholarships, where alumni interest in encouraging the flow of desirable applicants has been most marked.

Not only have these visits confirmed faith in the committee's recommendations but they have yielded suggestions which, for example, lead to a thoroughgoing study of our entrance requirements, last revised at the time of the War; to a change in the format of our Catalogue; and to certain alterations in our methods of awarding freshman scholarships.

The first of these culminated in a reduction in the number of subjects specifically required for admission to the first-year class, though not in the total number of units. In particular the foreign language requirements were made more flexible, and thus more in harmony with the programs of the secondary schools. Using a larger page-size for the Catalogue, the inclusion of illustrated material, and the rewriting of much of the descriptive material, brought forth a document which has been received with favor locally as well as at distant points.

Improvements in the methods of awarding freshman scholarships, which will become effective for 1936–37, are expected to lead to a wider geographical distribution, and to an earlier decision upon applications from candidates outside the New England area than at present. For 1935–36, 188 entering freshmen received awards carrying stipends of $40,825, the corresponding figures for 1934–35 being 144 and $26,550.

These grants represented a sizable proportion of the total undergraduate scholarship awards which, for 1935–36, numbered 459 and totalled $72,226, compared with 423 totalling $69,704 in 1934–35. The percentage of the undergraduate body receiving scholarship aid during 1935–36 was 23.8 com-

pared with 20.2 in 1934–35, 17.0 in 1933–34, 15.9 in 1932–33, 14.95 in 1931–32, and 18.2 in 1930–31.

During 1935–36, 436 individuals sought to borrow from the Technology Loan Fund, as compared with 520 in 1934–35 and 712 in 1933–34. Of this year's requests 329, or 75.5 per cent, received favorable action, the amount loaned being $124,567. The corresponding figures for the two preceding years were: 402, 77.3 per cent, and $152,656 in 1934–35; and 543, 76.3 per cent and $202,905 in 1933–34.

The decline in the amounts loaned annually from the Fund has been accompanied by a marked rise in the repayments which, during 1935–36, were $89,149 on principal account and $16,780 for interest, or a total of $105,929. The excess of income over outgo for the year was, therefore, $18,638 and it is to be anticipated that, during 1936–37, repayments on principal and interest will exceed the amount loaned.

Up to June 30, 1936, 1,653 individuals had borrowed $916,583 from this fund, the average amount loaned being $554. As of that date $200,583 had been repaid on principal account, representing 75 per cent of the amount due, and $46,960 had been paid on interest account. Of the unpaid 25 per cent due on principal account, interest had been received and extension of principal repayment granted on all but $16,829 of notes, indicating that it is by no means unreasonable to expect eventual repayment of 94 per cent of the loans made. It should also be noted that interest already received ($46,960) is equal to 70 per cent of the entire matured principal in arrears ($67,034). The advance payments during 1935–36 ($27,496) which exceeded the total of advance payments received prior to June 30, 1935 ($23,676), are likewise an encouraging sign.

Student employment conditions continued on the improved basis noted in last year's Report and, for 1935–36, 569 men were placed by the Undergraduate Employment Bureau of the Technology Christian Association: 217 under the National Youth Administration program of the Federal Government, 220 on other employment, and 132 under both classifications. Earnings under the National Youth Administration were $29,854 and through private employment, $36,899, or a total of $66,753.

For the second successive year the dormitories operated with a substantial waiting list, except for a brief period following midyears when the transfer of students to Coöperative courses created some temporary vacancies. In anticipation of 1936–37, the Graduate House, on July 1, 1936, had a waiting list of 75 and all rooms in the undergraduate houses had been leased, including 120 reserved for entering freshmen.

The average scholastic record of 674 men in 25 activity groups was 3.44 in June of 1936, the corresponding averages being 3.35 for 604 men in 24 activities in June of 1935, and 3.48 for 670 men in 25 activities in June of 1934. Fraternity averages rose slightly, for the average of 566 men in June of 1936 was 3.25, while 582 averaged 3.13 in June of 1935, and 593 averaged 3.23 in June of 1934.

For the tenth successive year the Annual Freshman Camp was conducted under the auspices of the Technology Christian Association with 250 entering students in attendance. Also the thirteenth Open House was operated on May 2, the affair being administered, as previously, by the Combined Professional Societies.

All four student publications had successful years but Tech Show and the Musical Clubs underwent further tribulation, due to a continued lack of undergraduate support. As a result the Advisory Council on Tech Show voted to suspend operation until further notice and the problem of the Musical Clubs was studied by a sub-committee of the Institute Committee which formulated a plan through which some of the Clubs' difficulties may be removed.

To emphasize its continued belief that the fostering of intramural sport as supplementary to intercollegiate schedules in stimulating students to participate in athletics, the M. I. T. A. A., upon the suggestion of the Advisory Council on Undergraduate Athletics, operated a winter sports train and organized a softball league composed of teams from the dormitories, the commuting students, and the fraternities.

Also, during the year, the Advisory Council procured a new lease for the land upon which the boathouse stands from the Metropolitan District Commission. The existing lease, which would have terminated in 1942, was replaced by one extending twenty-five years until 1961, the maximum period

allowed by law. Thus the necessity of obtaining funds to erect a new boathouse is eliminated from the problem of the immediate future.

The Nautical Association, conceived and carried through during 1935–36, forms the most striking addition in many years to the Institute's facilities for student recreation. It is a positive answer to a question of long-standing: What provision can be made for students generally, aside from those engaged in competitive rowing, to take advantage of the proximity of the Charles River Basin? The many donors of dinghies and equipment, and contributors to the cost of the sailing pavilion, are indicative of the widespread faith of alumni and others in this venture; the acceptance of the opportunities by the student body has been demonstrated by continual daily use since spring.

In conclusion it should be noted that, with 1936–37, there becomes operative a closer grouping for administrative purposes of the offices of the Registrar and Director of Admissions with that of the Dean of Students.

H. E. LOBDELL.

Dean of the Graduate School. The Graduate School probably reached a minimum registration of five hundred in 1934 as the number of students showed a decided increase last year and present indications are that this upward trend will continue the coming year. A comparison of the registration for the past five years is given below:

	1931	*1932*	*1933*	*1934*	*1935*
Doctor of Philosophy	66	84	94	101	90
Doctor of Science	85	65	77	88	106
Doctor of Public Health	2	...	...	...	1
Master in Architecture	12	9	11	16	7
Master of Science	386	332	297	266	295
Master in City Planning	...	...	...	...	6
Special Graduate Students	27	33	24	29	31
Total	578	523	503	500	536

It is of interest to compare the fields of study to which graduate students are particularly attracted at the present time. These data for the year 1935–36 are shown below:

School of Architecture	*Degree*	
Architecture	(Master in Architecture)	7
Architectural Engineering	(Master of Science)	1
City Planning	(Master in City Planning)	6
		14

School of Science	*S.M.*	*Sc.D.*	*Ph.D.*	*Dr.P.H.*	*Total*
Biology and Public Health	..	..	8	1	9
Chemistry	13	1	40	..	54
Geology	2	2	6	..	10
Mathematics	2	..	4	..	6
Physics	9	8	32	..	49
Total	26	11	90	1	128

School of Engineering	*S.M.*	*Sc.D.*	*Total*
Aeronautical Engineering	29	3	32
Meteorology	..	3	3
Business and Engineering Administration	17	..	17
Chemical Engineering	77	33	110
Civil Engineering	28	6	34
Sanitary Engineering	..	1	1
Electrical Engineering	26	25	51
Electrical Engineering Coöperative (VI-A)	18	..	18
Mechanical Engineering	37	8	45
Mining and Metallurgy			
Mining Engineering	5	1	6
Metallurgy	4	11	15
Ceramics	2	4	6
Naval Architecture and Marine Engineering	25	..	25
	268	95	363

From these figures it appears that nearly three times (2.8) as many graduate students are pursuing work in the engineering departments as in the science departments. This is due to the large number of students who return for one or more years of specialized work leading to the Master's degree in Engineering. In the science departments, on the other hand, most graduate students are studying for the doctorate, the total

number, 102, being greater than that of students working for the doctorate in all of the engineering departments combined, namely, 95. This is naturally to be expected as a Doctor's degree for those preparing themselves for teaching or research positions in science is now regarded as almost essential. It is also of interest to note that 80 per cent of the graduate students in science are registered in the Departments of Chemistry and Physics while in Engineering, Electrical Engineering, including the Five-Year Coöperative Course, and Chemical Engineering, including the Practice School, account for nearly 50 per cent of the total registration. Chemical Engineering, with a registration of 110, has more graduate students than any other department by a large margin. It will soon become necessary to limit the number of students admitted to those departments, the capacity of whose research laboratories has been reached. This aspect of the registration problem is now being studied by the Faculty Committee on Stabilization of Enrollment.

Three hundred and eighty-one or 71 per cent of the members of the Graduate School were graduates of colleges other than the Massachusetts Institute of Technology. This is an increase of 6 per cent over that of the preceding year, a tendency which is welcomed. The advantages of bringing together such a diversified group of students, particularly with the opportunities for social contacts now offered in the Graduate House, are obvious. The Graduate School included students from forty-three states, the District of Columbia, Hawaii and from the following twenty-one foreign countries:

Australia	England	Panama
Belgium	Germany	Poland
Brazil	India	Scotland
Canada	Irak	South Africa
China	Ireland	Sweden
Cuba	Japan	Switzerland
Denmark	Mexico	Turkey

One hundred and thirty-nine American colleges and technical schools and forty-one foreign institutions were represented.

The changes in policy announced in the last report relative to requirements and examinations for the Doctor's degree and to the adoption of a "degree list" of candidates presenting

themselves for higher degrees were put into effect during the past year with satisfactory results. The withdrawals from the June "degree list," however, were larger than anticipated and it is hoped these will be reduced as the plan is further developed. The chief changes in policy made during the year had reference to requirements for the Master's degree. They were, first, the adoption of a broader interpretation of undergraduate prerequisites for applicants desiring to work towards an advanced degree in a specialized field, and second, the acceptance under certain conditions of Spanish as the modern language requirement in place of French or German.

Requests from students who have completed minimum residence requirements to be allowed to do their theses in absentia have come before the Committee on the Graduate School with increasing frequency during the past year. The committee has acted on such requests in accordance with the Faculty rule which requires all theses to be carried out under the direction of a member of the Faculty and expressly states that work done in absentia may not be presented as a thesis for the doctorate. If, as sometimes happens, a research is of such a nature that it can be carried out more effectively away from the library or laboratories of the Institute, the case is brought before the Committee on the Graduate School with a statement as to the manner in which the work is to be supervised by a member of the Faculty, and the approval of the proposed procedure by the committee obtained. The policy in regard to thesis work done in absentia varies widely in different institutions.

The problem which is presented annually to the Committee on Scholarships of determining who among the hundreds of applicants for fellowships and scholarships should be chosen for awards is one of ever increasing difficulty. The number of applicants becomes greater every year, while the endowment for scholarships does not increase correspondingly. As a graduate scholarship award from Institute funds implies that the Institute encourages the student to continue his study beyond that required for the Bachelor's degree, the selection should be based not only on evidence of high scholastic ability but also on all the information obtainable regarding those other qualifications which contribute and are essential to a successful

career. A student should not be financed for graduate work on Institute scholarships, even though his scholastic standing be high, if the members of his department committee feel they will be unable to recommend him for a position after graduation. To encourage such a student to continue his studies in the Graduate School is no kindness to him or advantage to the Institute.

It is regrettable that the obligation involved in accepting a scholarship carries so little weight with some students. Experience has shown that students accept awards when announced in April, only to relinquish them if they obtain employment before the opening of the following semester. This necessitates a reallocation of funds by the committee just prior to the opening of the term to others on the waiting list. In the meantime some of the most desirable applicants on the list have made other plans and are unable to accept the award. To meet this difficulty the Corporation set up this year a reserve fund and authorized the Committee on Scholarships to announce awards in April in excess of the regular scholarship budget by an amount which experience indicated would probably be relinquished during the summer. This was done, with the result that the necessity of reallocating funds this fall has been greatly reduced.

The Redfield Proctor Traveling Fellowship was held last year by Maurice E. Bell, a graduate student in the Department of Physics, who has been studying at the University of Cambridge, England. The Automotive Engineering Fellowship offered by Mr. Alfred P. Sloan, Jr., was awarded to Herbert P. Haley, a graduate of the Georgia School of Technology and now carrying on research for his Doctor's degree in the Department of Mechanical Engineering.

The Graduate House has become so popular and accommodations are in such demand that at present every room has been taken for the coming year and there are over one hundred on the waiting list. The new students arriving from a distance are showing great disappointment at not being able to obtain accommodations. Dr. Ashdown is handling the room assignments with great tact and success. A larger Graduate House may well be one of the next most desirable developments in the Institute's housing plan. During the past year the

residents of the House included representatives of 105 universities located in 36 States and 14 foreign countries. The Sunday afternoon teas and Wednesday night weekly dinners arranged by Dr. Ashdown and his House Committees were very enjoyable, bringing students, their friends, and members of the Staff together in an informal way. A new custom which it is hoped may in time become tradition was instituted last June, namely, holding a tea on the afternoon of Commencement, when the graduating students, their families, friends, and members of the Faculty had an opportunity to meet. In later years this function will serve also to welcome returning alumni of the Graduate School to their old home.

H. M. GOODWIN.

The Registrar. The total registration for last year was 2,540, a gain of 33 or 1.3 per cent. The number of undergraduates increased from 2,009 to 2,018, and the number of graduate students increased from 498 to 522.

The freshman registration declined steadily during the depression from 734 in 1930 to 485 in 1933. The recovery during the last two years has been moderate with 542 in 1934 and 561 in 1935. The number of new students from other colleges has also been increasing as shown in Table 1.

TABLE 1

NEW STUDENTS ENTERING THE UNDERGRADUATE SCHOOL
1924–35

Year	New Students from Secondary Schools	College Transfers Entering Undergrad. Years	Total New Undergraduate Students	Total Undergraduate Registration
1924–25	440	328	768	2,652
1925–26	405	248	653	2,465
1926–27	381	222	603	2,309
1927–28	465	250	715	2,338
1928–29	483	297	780	2,456
1929–30	549	280	829	2,621
1930–31	609	230	839	2,670
1931–32	526	208	734	2,610
1932–33	491	146	637	2,308
1933–34	428	132	560	2,106
1934–35	467	150	617	2,009
1935–36	481	165	646	2,018

These two increases have balanced the effect of the smaller classes in the preceding year, and the result has been a temporary stabilization of the undergraduate registration around 2,000 students. The effect of a stabilized freshmen registration of 575 to 600 during the coming two years should produce an undergraduate student body of about 2,300 in 1938.

The number of graduate students has been around five hundred for the last four years. (See Table 2.) Approximately half of our graduate students each year are new. The total number of new graduate students has not changed much as the increase in the number of new students from other colleges has been nearly offset by the decline in the number of our own graduates who return for graduate work.

TABLE 2

NEW STUDENTS ENTERING THE GRADUATE SCHOOL

1924–1935

Year	M. I. T. S.B. Returning Following Sept. for Grad. Study	M. I. T. S.B. Returning a Year or More Later for Grad. Study	College Transfers Entering Grad. Year	Total New Graduate Students	Total Graduates
1924–25	†	†	136	†	286
1925–26	†	†	110	†	348
1926–27	†	†	160	†	362
1927–28	†	†	131	†	374
1928–29	52	12	120	184	412
1929–30	87	10	154	251	445
1930–31	89	23	191	313	539
1931–32	107	26	187	320	578
1932–33	89	22	143	254	523
1933–34	92	16	134	242	500
1934–35	76	16	152	244	498
1935–36	58	8	196	262	522

† Data not available for these years.

Statements about changes in quality in educational matters over a period of years are usually difficult to prove due to the inherent lack of any fixed standard. Our present strong impression that the scholastic quality of the recent entering

classes has been improving is based on the fact that 44 per cent of the freshman class which entered in 1933 came in without examinations (*i.e.*, these students were in the highest fifth of their class), and in 1935 this percentage had increased to 60 per cent.

The statistics for the year 1935–36 follow.

J. C. MacKinnon.

All statistics on registration are as of November 1, 1935
All statistics on degrees are through June, 1936

TABLE 1
The Corps of Instructors

	'23	'24	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34	'35
Faculty Members of the Staff	175	174	179	185	199	215	220	240	253	242	235	245	245
Professors	61	64	63	68	73	82	81	86	98	93	88	83	87
Associate Professors	43	42	49	55	58	61	59	63	68	60	57	69	81
Assistant Professors	46	51	53	51	58	64	71	80	79	81	80	82	68
Ex-Officio	—	—	—	—	—	—	2	4	3	3	5	6	6
Instructors	25	17	14	11	10	8	7	7	5	5	5	5	3
Other Members of the Staff	200	220	236	264	268	272	295	323	335	283	263	272	284
Instructors	92	98	112	116	115	119	116	123	133	105	90	86	90
Teaching Fellows	—	—	—	—	—	—	—	—	—	21	22	20	24
Assistants	60	59	53	63	55	53	68	70	96	45	43	70	76
Technical Assistants	—	—	—	—	—	—	—	—	—	28	31	28	—
Lecturers	6	16	21	23	30	29	32	32	34	28	25	25	24
Research Associates	25	26	21	24	29	22	21	31	31	32	25	22	27
Research Assistants	17	21	29	38	39	49	58	65	36	20	21	18	30
Research Fellows (D.I.C.)	—	—	—	—	—	—	—	2	5	3	3	2	1
Research Fellows	—	—	—	—	—	—	—	—	—	—	3	1	12
Special Investigator	—	—	—	—	—	—	—	—	—	1	—	—	—
Total	375	394	415	449	467	487	515	563	588	525	498	517	529
Other Members of the Faculty	16	15	17	14	13	11	14	15	15	17	25	26	27
Professors: Emeriti	8	7	7	6	6	4	4	6	7	13	21	23	24
Retired	5	5	7	5	4	3	4	3	3	—	—	—	—
Non-Resident	3	3	3	3	3	4	6	6	5	4	4	3	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	1935–36	2,540
1888–89	827	1912–13	1,611		

TABLE 3

Classification of Students by Courses and Years

Course Name and Number	1933–34 YEAR						1934–35 YEAR						1935–36 YEAR					
	1	2	3	4	G	Total	1	2	3	4	G	Total	1	2	3	4	G	Total
Aeronautical Engineering XVI	56	25	24	30	27	162	65	28	30	28	32	183	76	27	28	29	40	200
Architectural Engineering IV-A	5	6	8	12	—	31	4	4	4	8	3	23	5	3	3	4	2	17
Architecture IV, IV-B	16	20	24	27	18	105	14	16	22	25	16	93	13	19	17	17	13	79
Architecture (IV, IV-B) Fifth Year	—	—	—	30	—	30	—	—	—	27	—	27	—	—	—	21	—	21
Army Ordnance	—	—	—	9	—	9	—	—	—	—	9	9	—	—	—	—	10	10
Biology and Public Health VII	10	20	17	19	26	92	10	11	20	19	21	81	13	14	9	16	13	65
Building Engineering and Construction XVII	9	11	9	13	1	43	5	6	12	8	—	31	8	6	4	14	—	32
Business and Engineering Administration XV	58	86	99	83	17	343	50	79	70	90	16	305	58	69	63	71	19	280
Chemical Engineering X	83	66	56	51	37	293	98	58	69	42	57	324	112	78	56	46	56	348
Chemical Engineering Practice X-A, X-B	—	—	—	3	27	30	—	—	—	6	26	32	—	—	—	8	58	66
Chemistry V	22	20	21	17	65	145	28	16	20	16	57	137	30	22	14	19	55	140
Civil Engineering I	32	23	22	38	25	140	35	28	22	21	23	129	36	23	25	24	34	142
Economics and Engineering or Science	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
Electrical Engineering VI, VI-B, VI-C	43	36	51	60	56	246	62	28	48	49	55	242	55	45	42	49	57	248
Electrical Engineering (Coöperative) VI-A	39	34	24	26	26	149	32	37	24	23	22	138	28	35	32	20	18	133
Electrochemical Engineering XIV	8	7	11	8	1	35	11	8	7	8	4	38	8	7	6	6	—	27
General Engineering IX-B	2	12	10	11	—	35	6	11	21	14	—	52	7	11	14	29	—	61
General Science IX-A	1	—	3	8	—	12	2	2	1	5	—	10	3	2	3	4	—	12
Geology XII	—	3	2	2	14	21	—	3	2	3	8	16	3	—	1	2	9	15
Mathematics XVIII	3	5	3	8	9	28	7	5	10	3	10	35	3	5	3	9	6	26
Mechanical Engineering II	59	51	53	55	52	270	59	62	44	50	40	255	62	72	41	49	40	264
Mechanical Engineering (Coöperative) II-A	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	—	—	10
Metallurgy III$_{1,4}$	9	3	9	21	21	63	6	15	4	7	16	48	8	9	15	6	14	52
Mining Engineering III$_{1,3}$	5	5	8	10	7	35	8	6	4	8	6	32	6	6	6	4	6	28
Mining Engineering (Ceramics)	—	—	—	—	2	2	—	—	—	—	2	2	—	—	—	—	8	8
Naval Architecture and Marine Engineering XIII	13	18	14	19	2	66	18	18	23	13	3	75	6	22	16	16	2	62
Naval Construction XIII-A	—	—	5	10	11	26	—	—	8	7	10	25	—	—	8	8	7	23
Physics VIII	10	22	25	32	52	141	16	13	18	20	59	126	17	22	18	15	52	124
Railroad Operation I-A	—	—	—	—	2	2	—	—	—	—	—	—	—	—	—	—	—	—
Sanitary Engineering XI	2	2	2	5	2	13	4	1	2	2	3	12	—	4	2	2	1	9
Ship Operation XIII-C	—	5	7	12	—	24	2	1	6	6	—	15	3	4	4	7	—	18
Unclassified	—	7	6	2	—	15	—	7	5	—	—	12	1	8	8	1	—	18
Totals	485	487	513	*621	500	2,606	542	463	496	*508	498	2,507	561	513	448	*496	522	2,540

* These totals include fifth year in Architecture and City Planning.

TABLE 4-A

Classification of Students by Courses, Options and Years

COURSE NO.	NAME	OPTION	Option	YEAR 1 Opt.	1 Tot.	2 Opt.	2 Tot.	3 Opt.	3 Tot.	4 Opt.	4 Tot.	GRAD. Opt.	GRAD. Tot.	TOTAL Opt.	TOTAL Tot.	COURSE NUMBER
I	Civil Engineering	1. General	1	33		16		20		11		—		—		
		2. Transportation	2	2	36	2	23	3	25	10	24	—	34	—	142	I
		3. Hydroelectric	3	1		5		2		3		—		—		
		4. Geodesy and Seismology	4	—		—		—		—		—		—		
II	Mechanical Eng.	1. General	1	—		—		—		7		—		—		
		2. Automotive	2	—		—		—		11		—		—		
		3. Power	3	—	62	—	72	—	41	3	49	—	40	—	264	II
		4. Refrig. and Air Condition.	4	—		—		—		12		—		—		
		5. Production	5	—		—		—		15		—		—		
		6. Textile	6	—		—		—		1		—		—		
II-A	Mechanical Engineering — Coöperative			—	—	—	—	—	—	10	—	—	—	—	10	II-A
III	Mining Eng. and Metallurgy	1. Mining	1	5		6		4		4		6		28		
		2. Petroleum Production	2	1		—		2		—		—		—		
		3. Metallurgy	3	7	14	4	15	6	21	2	10	14	28	52	88	III
		4. Physical Metallurgy	4	1		5		9		4		—		—		
		Ceramics	Cer.	—		—		—		—		8		8		
IV	Architecture			—	13	—	19	—	17	—	14	—	7	—	70	IV
		Fifth Year		—	—	—	—	—	—	—	17	—	—	—	17	IV (5th)
IV-A	Architectural Engineering			—	5	—	3	—	3	—	4	—	2	—	17	IV-A
IV-B	City Planning			—	—	—	—	—	—	—	3	—	6	—	9	IV-B
		Fifth Year		—	—	—	—	—	—	—	4	—	—	—	4	IV-B (5th)
V	Chemistry			—	30	—	22	—	14	—	19	—	55	—	140	V
VI	Electrical Engineering			—	55	—	41	—	20	—	22	—	57	—	195	VI
VI-B	Electrical Engineering — Illuminating			—	—	—	4	—	2	—	—	—	—	—	6	VI-B
VI-C	Electrical Engineering — Communications			—	—	—	—	—	20	—	27	—	—	—	47	VI-C
VI-A	Electrical Engineering — Coöperative			—	28	—	35	—	32	—	20	—	18	—	133	VI-A
VII	Biology and Public Health	1a. Biology & Public Health	1a	11		5		4		10		—		—		
		1b. Biology	1b	—	13	—	14	—	9	—	16	—	13	—	65	VII
		2. Industrial Biology	2	2		7		3		2		—		—		
		3. Public Health Eng.	3	—		2		2		4		—		—		
VIII	Physics			—	17	—	22	—	18	—	15	—	52	—	124	VIII
IX-A	General Science			—	3	—	2	—	3	—	4	—	—	—	12	IX-A
IX-B	General Engineering			—	7	—	11	—	14	—	29	—	—	—	61	IX-B
X	Chemical Engineering			—	112	—	78	—	56	—	46	—	56	—	348	X
X-A	Chemical Engineering Practice — Graduate			—	—	—	—	—	—	—	—	—	58	—	58	X-A
X-B	Chemical Engineering Practice — Undergraduate			—	—	—	—	—	—	—	8	—	—	—	8	X-B
XI	Sanitary Engineering			—	—	—	4	—	2	—	2	—	1	—	9	XI

TABLE 4-A (*Continued*)

Classification of Students by Courses, Options and Years

COURSE NO.	NAME	OPTION	Option	YEAR 1 Opt.	1 Tot.	2 Opt.	2 Tot.	3 Opt.	3 Tot.	4 Opt.	4 Tot.	GRAD. Opt.	GRAD. Tot.	TOTAL Opt.	TOTAL Tot.	COURSE NUMBER
XII	Geology	1. General Geology & Strat.	1	1	3	—	—	—	1	1	2	—	9	—	15	XII
		2. Physical & Econ. Geology	2	2		—		1		1		—		—		
		3. Mineralogy	3	—		—		—		—		—		—		
		4. Geophysics	4	—		—		—		—		—		—		
XIII	Naval Architecture and Marine Engineering			—	6	—	22	—	16	—	16	—	2	—	62	XIII
XIII-A	Naval Construction			—		—		—	8	—	8	—	7	—	23	XIII-A
XIII-C	Ship Operation			—	3	—	4	—	4	—	7	—		—	18	XIII-C
XIV	Electrochemical Engineering			—	8	—	7	—	6	—	6	—	—	—	27	XIV
XV	Business and Engineering Administration	1a. Civil	1a	3	58	6	69	—	63	1	71	—	19	—	280	XV
		1b. Mechanical	1b	18		31		35		35		—		—		
		1c. Industrial Practice	1c	12		23		11		15		—		—		
		2. Chemical	2	25		9		17		20		—		—		
XVI	Aeronautical Engineering — Aeronautics		Aer.	—	76	—	27	—	28	—	29	20	40	—	200	XVI
	Aeronautical Engineering — Meteorology		Met.	—		—		—		—		20		—		
XVII	Building Engineering and Construction			—	8	—	6	—	4	—	14	—		—	32	XVII
XVIII	Mathematics			—	3	—	5	—	3	—	9	—	6	—	26	XVIII
	Economics and Engineering or Science			—		—		—		—		—	2	—	2	Ec. & Eng. or Sc
	Army Ordnance			—		—		—		—		—	10	—	10	A. O.
	Unclassified			—	1	—	8	—	8	—	1	—		—	18	Unc.
Total					561		513		448		*496		522		2,540	Total

* This total includes 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					TOTAL	COURSE
		1	2	3	4	G		
II Mechanical Engineering		—	1	1	1	5	8	II
III Mining Engineering and Metallurgy	1, 2	—	—	1	—	—	1	III$_{1,2}$
	Cer.	—	—	—	—	2	2	III Cer.
IV Architecture		1	5	2	1	—	9	IV
IV Architecture (Fifth Year)		—	—	—	2	—	2	IV (5th Yr.)
IV-B City Planning		—	—	—	1	—	1	IV-B
V Chemistry		—	—	—	2	1	3	V
VI Electrical Engineering		—	1	—	2	5	8	VI
VI-C Electrical Engineering (Communications)		—	—	2	—	—	2	VI-C
VII Biology and Public Health		—	1	1	—	2	4	VII
VIII Physics		—	—	—	—	3	3	VIII
X Chemical Engineering		—	—	—	—	3	3	X
X-A Chemical Engineering Practice		—	—	—	—	1	1	X-A
XIII Naval Architecture & Marine Engineering		—	2	—	1	—	3	XIII
XIII-C Ship Operation		—	—	—	1	—	1	XIII-C
XV Business and Engineering Administration		—	4	1	—	4	9	XV
XVI Aeronautical Engineering		—	—	—	1	5	6	XVI
XVII Building Engineering and Construction		—	1	—	1	—	2	XVII
XVIII Mathematics		—	—	—	1	—	1	XVIII
Unclassified		1	1	—	—	—	2	Unc.
Total		2	16	8	*14	31	71	

* This total includes Fifth Year in Architecture.

TABLE 4-C

Classification of Former Students Who Returned This Year*
(Included in Table 4-A)

COURSE	OPT.	YEAR					TOTAL	COURSE
		1	2	3	4	G		
I Civil Engineering		—	1	1	1	2	5	I
II Mechanical Engineering		3	4	2	2	2	13	II
III Mining Engineering and Metallurgy	3, 4	—	—	—	2	1	3	III$_{3,4}$
IV-A Architectural Engineering		—	—	—	1	—	1	IV-A
IV-B City Planning		—	—	—	—	2	2	IV-B
V Chemistry		2	—	1	—	—	3	V
VI Electrical Engineering		—	1	1	1	3	6	VI
VI-A Electrical Engineering (Coöperative)		—	1	—	—	—	1	VI-A
VI-B Electrical Engineering (Illumination)		—	—	1	—	—	1	VI-B
VI-C Electrical Engineering (Communications)		—	—	—	3	—	3	VI-C
VII Biology and Public Health		—	3	1	—	1	5	VII
VIII Physics		—	1	2	1	2	6	VIII
IX-A General Science		—	1	1	—	—	2	IX-A
IX-B General Engineering		—	—	—	2	—	2	IX-B
X Chemical Engineering		1	1	2	1	1	6	X
XIII Naval Architecture & Marine Engineering		—	1	—	1	—	2	XIII
XIII-C Ship Operation		—	—	1	—	—	1	XIII-C
XV Business and Engineering Administration		3	6	—	2	1	12	XV
XVI Aeronautical Engineering		2	—	1	1	4	8	XVI
XVII Building Engineering and Construction		1	—	—	—	—	1	XVII
XVIII Mathematics		—	—	1	—	—	1	XVIII
Economics & Engineering or Science		—	—	—	—	1	1	Ec.&E.orSci.
Unclassified		—	1	—	1	—	2	Unc.
Total		12	21	15	19	20	87	

* Excluding 4 Special Students.

TABLE 5

Classification of Students by Courses since 1928

	1928–29	1929–30	1930–31	1931–32	1932–33	1933–34	1934–35	1935–36
Engineering Courses . . . . . *Total*	2,305	2,405	2,564	2,495	2,197	2,008	1,961	2,028
Aeronautical Engineering XVI	224	278	233	193	193	162	183	200
Architectural Engineering IV-A	84	73	72	53	34	31	23	17
Building Engineering and Construction XVII	90	102	82	67	45	43	31	32
Business and Engineering Administration XV	303	299	347	378	371	343	305	280
Chemical Engineering X, X-A, X-B	318	384	404	402	315	323	356	414
Civil Engineering I, I-A	260	240	236	224	175	142	129	142
Electrical Engineering VI, VI-A, VI-B, VI-C	513	484	523	502	443	395	380	381
Electrochemical Engineering XIV	50	47	37	45	42	35	38	27
Fuel and Gas Engineering	13	7	11	9	—	—	—	—
General Engineering IX-B	30	37	46	43	32	35	52	61
Mechanical Engineering II, II-A	283	303	369	344	315	270	255	274
Mining Engineering and Metallurgy III	51	67	105	114	94	100	82	88
Naval Architecture and Marine Eng. XIII, XIII-C	55	56	71	89	93	90	90	80
Naval Construction XIII-A	12	14	15	20	34	26	25	23
Sanitary Engineering XI	19	14	13	12	11	13	12	9
Science Courses . . . . . *Total*	291	341	378	439	439	439	405	382
Biology and Public Health VII	68	93	99	100	94	92	81	65
Chemistry V	123	118	146	158	146	145	137	140
General Science IX-A	11	13	9	4	10	12	10	12
Geology XII	26	24	17	20	20	21	16	15
Mathematics XVIII	19	24	29	32	31	28	35	26
Physics VIII	44	69	78	125	138	141	126	124
Architecture IV, IV-B . . . . . *Total*	218	228	200	190	159	135	120	100
Army Ordnance . . . . . *Total*	9	11	11	10	11	9	9	10
Economics and Engineering or Science . . . . . *Total*	—	—	—	—	—	—	—	2
Unclassified . . . . . *Total*	45	81	56	54	25	15	12	18
Grand Total	2,868	3,066	3,209	3,188	2,831	2,606	2,507	2,540

TABLE 6
GEOGRAPHICAL CLASSIFICATION OF STUDENTS SINCE 1931

UNITED STATES	1931	1932	1933	1934	1935
North Atlantic . . . . . Total	2,375	2,178	2,050	1,919	1,877
Connecticut	81	72	69	76	92
Maine	54	45	38	37	28
Massachusetts	1,558	1,373	1,264	1,148	1,088
New Hampshire	39	41	37	33	23
New Jersey	113	118	122	136	143
New York	345	347	337	326	361
Pennsylvania	114	111	119	110	104
Rhode Island	54	55	49	36	29
Vermont	17	16	15	17	9
South Atlantic . . . . . Total	143	130	94	82	106
Delaware	12	8	4	4	7
District of Columbia	43	53	35	32	36
Florida	10	6	3	3	7
Georgia	4	2	1	2	7
Maryland	22	19	14	19	20
North Carolina	10	8	7	5	7
South Carolina	4	3	3	2	3
Virginia	27	27	24	12	12
West Virginia	11	4	3	3	7
South Central . . . . . Total	81	52	45	51	51
Alabama	11	7	4	2	3
Arkansas	3	2	2	2	1
Kentucky	12	10	7	9	14
Louisiana	10	8	7	9	8
Mississippi	4	4	2	2	2
Tennessee	11	5	8	7	7
Texas	30	16	15	20	16
North Central . . . . . Total	286	250	226	238	262
Illinois	64	58	54	66	76
Indiana	16	13	10	12	16
Iowa	11	7	6	7	8
Kansas	11	11	7	6	6
Michigan	27	28	19	21	18
Minnesota	20	14	18	17	15
Missouri	37	37	34	33	39
Nebraska	8	7	5	4	4
North Dakota	6	2	4	1	5
Ohio	66	58	55	52	58
South Dakota	—	2	—	1	3
Wisconsin	20	13	14	18	14
Western . . . . . Total	109	78	74	90	101
Arizona	4	1	2	2	2
California	39	31	24	32	38
Colorado	18	11	11	15	23
Idaho	3	2	2	1	—
Montana	6	4	3	3	—
Nevada	1	—	—	—	—
New Mexico	1	—	4	4	6
Oklahoma	7	7	7	6	5
Oregon	9	4	6	8	6
Utah	1	4	4	1	4
Washington	19	13	11	18	16
Wyoming	1	1	—	—	1
Territories and Dependencies . Total	12	8	8	5	4
Alaska	1	1	—	—	—
Canal Zone	1	1	1	—	—
Hawaii	5	4	4	3	1
Philippine Islands	3	—	1	—	—
Puerto Rico [4]	2	2	2	2	3
Virgin Islands	—	—	—	—	—
Total for United States	3,006	2,696	2,497	2,385	2,401

TABLE 6 (*Continued*)

Foreign Countries	1931	1932	1933	1934	1935
Total	182	135	109	122	139
Argentina	1	1	1	3	5
Australia	2	2	1	—	2
Austria	1	1	1	3	2
Belgium	2	3	1	2	2
Bermuda	—	—	1	1	—
Brazil	—	—	—	2	1
British West Indies	2	1	1	2	—
Canada	34	26	31	24	29
Chile	1	1	1	1	—
China	17	16	12	28	35
Colombia	6	5	5	3	1
Costa Rica	1	—	—	—	—
Cuba	14	9	8	7	12
Czechoslovakia	1	—	—	—	—
Denmark	1	1	—	—	1
Ecuador	2	1	—	1	—
Egypt	1	—	—	—	—
England	3	1	3	3	6
France	4	4	2	2	1
Germany	5	2	2	2	1
Guatemala	—	—	—	—	1
Honduras	—	—	—	—	2
Hungary	—	1	—	—	—
India	6	6	3	6	6
Iraq	2	3	1	2	2
Ireland	1	1	1	1	1
Italy	—	—	—	1	—
Japan	5	4	3	7	5
Java	—	—	1	—	—
Lithuania	2	—	—	—	—
Manchukuo	—	—	2	—	—
Mexico	13	6	5	5	4
Netherland Indies	—	1	—	1	1
Netherlands	—	—	—	1	1
Newfoundland	—	—	—	1	—
Norway	2	2	3	1	1
Palestine	4	3	1	—	—
Panama	3	3	1	2	1
Persia	—	—	—	—	1
Peru	3	2	—	—	—
Poland	1	1	1	—	1
Salvador	2	1	1	—	—
Scotland	1	—	—	—	1
Siam	3	1	1	1	1
Soviet Union	25	20	8	1	1
Spain	2	—	1	—	—
Sweden	2	—	2	—	1
Switzerland	1	—	1	3	1
Syria	—	2	—	1	1
Turkey	—	—	—	1	2
Union of South Africa	4	4	2	2	4
Venezuela	2	—	1	1	2
Grand Total, United States and Foreign	3,188	2,831	2,606	2,507	2,540

TABLE 7
Women Students Classified by Courses and Years

COURSE	YEAR					Total
	1	2	3	4	G	
I Civil Engineering	1	—	—	—	—	1
IV Architecture	2	3	—	2	—	7
IV Architecture (Fifth Year)	—	—	—	1	—	1
IV-A Architectural Engineering	—	—	—	1	—	1
IV-B City Planning	—	—	—	2	—	2
V Chemistry	1	2	2	1	4	10
VI-C Electrical Engineering Communications	—	—	—	1	—	1
VII Biology and Public Health	1	1	—	1	3	6
VIII Physics	1	1	—	—	2	4
X Chemical Engineering	—	1	—	—	1	2
XVI Aeronautical Engineering	1	—	2	1	—	4
XVIII Mathematics	—	—	—	—	2	2
Total	7	8	4	10*	12	41

* This total includes fifth year in Architecture.

TABLE 8
Old and New Students

Year	1930–31	1931–32	1932–33	1933–34	1934–35	1935–36
Students registered at end of last academic year (including specials)	1,938	1,949	1,866	1,748	1,568	1,558
Students who have previously attended the Institute, but were not registered at end of last academic year (including specials)	165	231	126	120	124	91
New students who entered by examination	609	526	403	241	214	194
New students who entered without examination	——	——	89	187	253	287
New students who entered from other colleges as candidates for degrees	421	395	289	266	302	361
New students (specials, not candidates for degrees)	76	87	58	44	46	49
Total	3,209	3,188	2,831	2,606	2,507	2,540

TABLE 8-A
New Students Admitted by Examination

Status of Admission	Year of Entrance				
	1931	1932	1933	1934	1935
Clear	373	288	164	129	120
1 Condition	81	72	47	51	50
2 Conditions	48	31	24	24	19
3 Conditions	16	7	6	7	4
More than 3 Conditions	8	5	—	3	1
Total	526	403	241	214	194

TABLE 9

List of American Colleges and Universities, with Number of Graduates Attending the Institute

College		College		College	
Alabama Polytechnic Inst.	1	Mich.Col.of Min. & Tech.	1	University of Illinois	7
Allegheny College	1	Missouri School of Mines	1	University of Iowa	1
Amherst College	2	Missouri Valley College	1	University of Kansas	3
Armour Inst. of Tech.	2	Montana School of Mines	1	University of Kentucky	3
Bates College	3	Mount Holyoke College	1	University of Louisville	1
Boston College	4	Muskingum College	1	University of Maine	3
Boston University	2	Newark College of Eng.	1	University of Maryland	2
Bowdoin College	5	New York University	1	University of Michigan	4
Brooklyn College	1	Niagara University	1	University of Minnesota	2
Brown University	3	Northeastern University	3	University of Montana	1
California Inst. of Tech.	3	Northwestern University	2	Univ. of New Hampshire	1
Carleton College	2	Norwich University	1	Univ. of North Carolina	4
Carnegie Inst. of Tech.	3	Oberlin College	1	Univ. of North Dakota	1
Case School of App. Sci.	3	Ohio State University	5	University of Notre Dame	6
Central College (Mo.)	1	Oregon State Agri. Col.	3	University of Oklahoma	2
Clarkson Mem.Sch.of Tech.	1	Parsons College	1	University of Oregon	2
Clemson Agri. College	1	Pennsylvania State Col.	11	Univ. of Pennsylvania	3
Colby College	2	Poly. Inst. of Brooklyn	2	University of Pittsburgh	1
Colgate University	1	Pomona College	2	University of Richmond	3
College of City of N. Y.	4	Pratt Institute	1	University of Rochester	3
College of Puget Sound	1	Princeton University	3	Univ. of Southern Calif.	1
College of Wooster	2	Purdue University	2	University of Tennessee	4
Colorado College	1	Radcliffe College	1	University of Texas	4
Columbia College (Ia.)	1	Rensselaer Poly. Inst.	3	University of Toledo	1
Columbia Univ. (N. Y.)	2	Rice Institute	2	University of Utah	3
Cornell University	5	Rutgers University	3	University of Vermont	1
Dartmouth College	8	St. Olaf College	3	University of Virginia	7
Davidson College	1	Simmons College	1	University of Washington	6
DePauw University	1	Smith College	2	University of Wisconsin	2
Drexel Institute	4	S. Dakota St. Sch. of Mines	1	Virginia Military Inst.	2
Franklin & Marshall Col.	1	Stanford University	14	Virginia Poly. Inst.	2
George Washington Univ.	1	Stevens Inst. of Tech.	1	Washington & Lee Univ.	1
Georgia School of Tech.	4	Swarthmore College	4	Washington University	2
Hampden-Sidney College	2	Syracuse University	2	Wellesley College	4
Harvard University	17	Temple University	3	Wesleyan University	3
Haverford College	2	Texas Agri. & Mech. Col.	1	West Virginia Univ.	1
Holy Cross College (Mass.)	1	Texas College of Mines	1	W. Va. Wesleyan Col.	1
Howard University	1	Texas Tech. College	1	Wheaton College	1
Hunter College	1	Trinity Col. (Conn.)	1	Whitman College	1
Illinois College	1	Tufts College	8	Willamette University	2
Iowa State Col. of A.&M.A.	2	Tuskegee St. Nor.&Ind. In.	1	Williams College	9
Johns Hopkins University	3	Union College	1	Wittenberg College	1
Kansas State Agri. Col.	2	U. S. Military Academy	21	Woodstock College	1
Kent State University	1	U. S. Naval Academy	30	Worcester Poly. Inst.	2
Lafayette College	1	University of Alabama	1	Yale University	11
Lehigh University	5	University of Arizona	2		
Lincoln University	1	University of Buffalo	1	Total	614
Louisiana Poly. Inst.	1	University of California	7		
Louisiana State Univ.	3	University of Chicago	2	Number of American Colleges Represented	155
Loyola University	3	University of Cincinnati	2	Number of Foreign Colleges Represented (Not listed)	48
Marshall College	1	University of Colorado	6	Total	203
Mass. Coll. of Pharmacy	1	University of Dayton	1		
Mass. Inst. of Tech.	180	University of Delaware	1		
Mass. State College	2	University of Denver	4		
Miami University	1	University of Florida	1		

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	41	18	5	2	66
Second year	8	26	9	10	53
Third year	—	9	5	24	38
Fourth year	—	—	1	7	8
Graduate year	—	—	4	192	196
Total	49	53	24	235	361

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 1935	Other Graduates	Total
				Sept. 1935		Previous Years					
	Sept. 1935	Previous Years		Undergrad.	Grad.	Undergrad.	Grad.				
Aeronautical Engineering XVI	7	15	22	—	19	1	9	29	2	5	7
Architectural Engineering IV-A	1	1	2	—	—	—	1	1	—	1	1
Architecture IV, IV-B	3	17	20	3	6	5	2	16	4	1	5
Army Ordnance	—	—	—	—	10	—	—	10	—	—	—
Biology and Public Health VII	2	4	6	—	2	—	4	6	—	5	5
Building Engineering and Construction XVII	—	2	2	—	—	1	—	1	—	—	—
Business and Eng. Administration XV	13	22	35	1	11	1	3	16	—	1	1
Chemical Engineering X, X-A, X-B	26	23	49	1	48	—	43	92	15	4	19
Chemistry V	3	3	6	—	17	—	19	36	4	14	18
Civil Engineering I	8	13	21	1	21	2	6	30	3	4	7
Economics and Engineering or Science	—	—	—	—	1	—	—	1	—	1	1
Electrical Engineering VI, VI-A, VI-B, VI-C	24	35	59	11	22	8	23	64	18	7	25
Electrochemical Engineering XIV	—	—	—	—	—	—	—	—	—	—	—
General Engineering IX-B	1	5	6	2	—	3	—	5	—	—	—
General Science IX-A	—	2	2	—	—	—	—	—	—	—	—
Geology XII	1	—	1	—	6	—	1	7	—	2	2
Mathematics XVIII	—	2	2	—	2	—	2	4	1	1	2
Mechanical Engineering II, II-A	18	25	43	5	11	4	11	31	3	10	13
Mining Engineering and Metallurgy III	8	6	14	—	8	—	9	17	2	7	9
Naval Architecture XIII, XIII-C	4	5	9	3	1	1	—	5	—	1	1
Naval Construction XIII-A	—	—	—	8	—	8	7	23	—	—	—
Physics VIII	2	2	4	—	11	1	21	33	6	11	17
Sanitary Engineering XI	—	—	—	1	—	—	—	1	—	1	1
Unclassified	8	2	10	—	—	—	—	—	—	—	—
Total	129	184	313	36	196	35	161	428	58	76	134

TABLE 12

NUMBER OF DEGREES AWARDED IN DECEMBER, 1935 AND JUNE, 1936

Name of Course	S.B.		B.Arch.		S.M.		M.Arch.		Ph.D.		Sc.D.		Totals	
	Dec. '35	June '36	Dec. '35	June '36	Dec. '35	June '36	Dec. '35	June '36	Dec. '35	June '36	Dec. '35	June '36	Dec. '35	June '36
Aeronautical Engineering	1	21	—	—	—	4	—	—	—	—	—	1	1	26
Architectural Engineering	—	3	—	—	1	3	—	—	—	—	—	—	1	6
Architecture	—	—	2	12	—	—	9	2	—	—	—	—	11	14
Biology	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Biology and Public Health	1	8	—	—	—	—	—	—	—	—	—	—	1	8
Building Engineering and Construction	1	12	—	—	—	—	—	—	—	—	—	—	1	12
Business and Engineering Administration	5	62	—	—	—	2	—	—	—	—	—	—	5	64
Ceramics	—	—	—	—	—	2	—	—	—	—	—	1	—	3
Chemical Engineering	1	24	—	—	4	2	—	—	—	—	—	9	5	35
Chemical Engineering Practice	—	19	—	—	2	28	—	—	—	—	—	—	2	47
Chemistry	1	15	—	—	1	1	—	—	4	13	1	1	7	30
City Planning	—	—	1	4	—	—	—	1	—	—	—	—	1	5
Civil Engineering	4	22	—	—	5	10	—	—	—	—	—	—	9	32
Electrical Engineering (Inc. VI-A)	11	51	—	—	13	12	—	—	—	—	1	—	25	63
Electrochemical Engineering	—	5	—	—	—	—	—	—	—	—	—	—	—	5
General Engineering	4	24	—	—	—	—	—	—	—	—	—	—	4	24
General Science	—	5	—	—	—	—	—	—	—	—	—	—	—	5
Geology	—	2	—	—	—	2	—	—	—	—	—	—	—	4
Industrial Biology	1	1	—	—	—	—	—	—	—	—	—	—	1	1
Mathematics	—	8	—	—	—	2	—	—	—	2	—	—	—	12
Mechanical Engineering	2	42	—	—	3	7	—	—	—	—	—	—	5	49
Metallurgy	—	6	—	—	—	—	—	—	—	—	1	3	1	9
Meteorology	—	—	—	—	—	4	—	—	—	—	—	—	—	4
Military Engineering	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mining Engineering	—	2	—	—	—	1	—	—	—	—	—	1	—	4
Naval Architecture and Marine Engineering	1	9	—	—	—	—	—	—	—	—	—	—	1	9
Naval Construction	—	—	—	—	—	7	—	—	—	—	—	—	—	7
Petroleum Engineering	—	—	—	—	—	1	—	—	—	—	—	—	—	1
Physics	1	11	—	—	—	4	—	—	2	9	—	1	3	25
Public Health Engineering	—	4	—	—	—	—	—	—	—	—	—	—	—	4
Sanitary Engineering	—	2	—	—	—	—	—	—	—	—	—	—	—	2
Ship Operation	1	6	—	—	—	—	—	—	—	—	—	—	1	6
Without Course Classification	—	—	—	—	8	16	—	—	—	—	—	—	8	16
Totals	35	364	3	16	37	108	9	3	6	24	3	17	93	532

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	—	—	—	—	—	10	29
1871	—	—	—	—	—	—	—	—	2	8	—	—	—	—	—	—	2	—	2	—	—	—	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	86	8	16	3	2	7	86	—	14	13	14	2	471	
1934	26	10	—	16	13	78	48	6	15	35	82	7	8	9	1	8	50	—	26	25	28	5	496	
1935	27	8	—	18	8	74	43	5	15	18	54	8	19	4	1	3	45	—	14	14	19	1	398	
§1936	21	3	—	13	12	62	24	19	15	22	48	5	24	5	2	8	42	—	8	15	11	2	361	
Total	235	164	865	263	107	1,422	1,387	149	756	2,211	2,652	283	350	171	64	52	2,804	5	838	441	224	256	15,698	

*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 1936.

TABLE 14

Degrees of Master of Science Awarded

	Aeronautical Engineering	Architectural Engineering	Architecture	Biology and Pub. Health	Business and Eng. Admin.	Ceramics	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.	Petroleum Engineering	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	2		1	2		16	14	4	13	55	1				3	16	6		1		10			7		2	21	177
*1936	4	3			2	2	2	28	1	10	12				2	2	7		4	1		7		1	4			16	108
Total	109	19	84	27	32	2	180	399	103	158	784	27	26	1	36	28	218	26	13	25	9	239	5	1	49	14	18	451	3,083

*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	Master in City Planning
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	17	4	11	—
*1936	12	4	2	1
Total	91	8	97	1

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	15	2	3	7	31
*1936	—	13	—	2	9	24
Total	20	154	25	18	27	244

*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	1	—	4	—	—	2	—	1	1	—	—	1	1	14
*1936	1	1	9	1	—	—	—	—	—	—	3	—	1	—	1	—	17
Total	7	2	55	7	5	29	2	5	5	9	28	2	3	1	9	1	170

* 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 (1868–1936)

Bachelor of Science	15,699
Bachelor in Architecture	91
Bachelor of Architecture in City Planning	8
Master of Science	3,083
Master in Architecture	97
Master in City Planning	1
Doctor of Philosophy	244
Doctor of Science	170
Doctor of Public Health	4
Doctor of Engineering (Discontinued after 1918)	4
Grand Total	19,401

Admissions. This year has been notable for a change in the entrance requirements made by the Committee on Admissions after a careful study of the admission procedure of the Institute. This change makes the requirements more flexible than they have been for years past and affords greater opportunity for the selection of students. The number of entrance examinations is reduced to a minimum of four mathematical subjects, Algebra, Plane Geometry, Solid Geometry, and Trigonometry, or to the College Board mathematical examination Gamma which includes these subjects. Physics and a satisfactory command of English are required. Chemistry is no longer a required subject, but preparation in it is recommended as a

help to the first year's work in that field. A larger choice of electives is allowed. No language is specified for admission, but various languages, including French, German, Spanish, Italian, Latin, and Greek, may be offered, and the study of language is definitely encouraged. The professional departments determine what language, or languages, shall be acceptable for a degree, and deficiencies in them may be made up after entrance.

These changes are in accord with the educational spirit of the times, as shown by the revised entrance requirements of many of the better technical and collegiate institutions of the country, and they reflect also the feeling of the alumni, who believe that a system of admission less rigid than that which has prevailed will open the doors of the Institute to a wider range of desirable candidates.

More stress will be laid in the future upon the character of the student's school record as a whole, and information in regard to his personality and aptitudes will be scrutinized. Well-recommended students who are graduated in the highest fifth of classes in approved secondary schools, and offer sufficient acceptable subjects, are already admitted without examinations, and constitute about sixty per cent of the candidates for admission. This recent method of admission, still proving very satisfactory, will be continued. The principle of selection, however, will be applied by the Committee on Admissions to all candidates, whatever their method of admission, or their numbers, according to the new stabilization plan of enrollment which limits the size of the freshman class.

Continuing its policy of giving specific information and counsel in advance in regard to its entrance requirements and the variety of occupations to which its varied kinds of professional training leads, the Institute has sent members of its Faculty to visit secondary schools near home, and its Director of Admissions to schools in distant centers of population. This year the Director of Admissions visited educational institutions in the Southern States and in Cuba, giving vocational lectures. In colleges and universities he conferred with students who were anticipating admission with advanced standing; or who were expecting to take up graduate work, and needed advice as to procedure. Many of the Honorary Secretaries, of whom there are more than a hundred located in the

United States and foreign countries, have been helpful in making known at college choosing conferences and in private interviews the opportunities for study offered at the Institute, as well as in securing for the Admissions Office desired information about prospective candidates.

After sixteen years of service in charge of admissions, the Director, with appreciation of the hearty coöperation both of the officers of the Institute and the alumni, retires to be succeeded by Professor B. A. Thresher of the Department of Economics and Social Science.

JAMES L. TRYON.

Summer Session. The most important consideration during the year was the revival of the Committee on the Summer Session. Instructions were given to the committee to make a careful study of the session in order to determine what changes might be instituted to increase the effectiveness of its present functions and also in what directions its activities might well be extended. The chairman of the committee was retained during the summer to direct the study, and to present a formal report. This report has been prepared and certain parts of it are contained here.

The activities of the Summer Session fall roughly into four academic groups (1) the regular Summer Session subjects designed to aid Institute students in making up work or to anticipate future requirements, (2) the subjects designed to prepare candidates for the fall entrance examinations, (3) the professional summer schools in civil engineering, mining engineering, metallurgy, and petroleum production, given outside of Cambridge, and (4) the special extension institutes or seminars lasting three to six weeks and designed for mature students, engineers, and teachers.

The total registration was 1,174, an increase of 17 per cent over the corresponding figure of 1,004 for last summer, all of the subjects attracting a few more students than last year. The attendance at the entrance subjects in Mathematics was much larger than it has been for the past few years, although it is impossible to state whether or not this is due to the change in our entrance requirements.

The most feasible and attractive area for expansion and

development appears to be in the fourth group mentioned above, namely the special institutes such as those in Public Health, Textile Engineering, Colloid Chemistry, and Spectroscopy. Informal personal conversations with heads of departments have revealed an interest in organizing additional institutes in special fields. It seems that the most essential factor in their success is the leadership of an outstanding man in the particular field. In some cases we have those men already on the Institute staff. Where this is not the case, it would be necessary to have available sufficient funds to attract outstanding men to come here for the summer and build the special institutes around them. The Committee on the Summer Session will, no doubt, wish to explore these possibilities in some detail during the coming year.

A special four and one-half week course in Public Health was offered this year principally to take care of fifteen special government students who were enrolled in March and whose instruction was not complete by the end of the academic year. It appears that the course was definitely a success and the Institute could render a public service by offering instruction in public health to qualified men and women who are particularly interested.

The course in Textile Engineering has been offered for the past eight years. The number this year was somewhat below normal due to unavoidable reasons which forced several of those who had enrolled for the subject to drop out. Because of the unique, as well as standard facilities of the Textile Laboratory, and the ability of its Director, the laboratory is fast building a reputation in the industry for progressive research and teaching, and it would seem desirable that the Summer Session work be continued, strengthened and rendered even more appealing to the industry. A number of textile men attended the color conference carried on in conjunction with the spectroscopy conference, and it seems that it might be possible to conduct a conference on textile research simultaneously with the spectroscopy conference, and thus allow those interested, the opportunity of participating in the color conference immediately afterward.

The decision to arrange a course in Colloid Chemistry was made at rather a late date, but the registration amounted to

twenty-six. The course was well received and the indication is that it fills a place of need. Already several requests have been received that the subject be offered next summer.

Early in 1933 it was decided to take advantage of the unusual spectroscopic facilities available at the Institute by inaugurating several new departures designed to extend the use of these facilities in the summer by offering their use to outsiders, to aid in the development and wider use of applied spectroscopy, and to extend the prestige of the Institute as a research and teaching center and source of well-trained graduates in spectroscopic lines. Three projects were undertaken: (1) a group of lecture and laboratory courses on qualitative and quantitative analysis of materials by means of the spectroscope; (2) a summer conference on Spectroscopy and Its Applications; and (3) a general invitation to qualified experts to use the facilities of the spectroscopy laboratory during the summer months. During succeeding summers the attendance has increased at about the rate of 30 per cent a year. The ability of the students enrolled in the subjects has been uniformly high.

The summer conferences on Spectroscopy and Its Applications have shown a similar growth. The approximate attendance at each conference has been as follows:

1933 — 70; 1934 — 100; 1935 — 140; 1936 — 200; with an additional extra 200 for the color conference. At the conference this summer fifty-one papers in diverse fields were presented by outstanding scientists, making a program of great importance. The publicity accruing to the Institute from these conferences has been wide and favorable. Increasing pressure has been brought to bear at each conference to have a volume of proceedings published, and a recommendation that this be done is now under consideration.

A characteristic feature of these summer courses and conferences is the coöperation encouraged between departments. Departmental barriers are completely overcome and the resulting course is characterized by its unusual breadth. A typical example of it may be found in the course in Textile Engineering which involved coöperation with the color measurements laboratory, the Biology Department laboratories (moulds and bacteria present on textiles), the Chemistry Department

(organic, cellulose and dye chemistry), the Chemical Engineering laboratories (drying problems, colloid and rubber chemistry), Petrographic and Ceramics laboratory (use of polarized light), Heat Measurements laboratory (heat transfer problems), and the Electrical Laboratory (types of electrical measurements). In every case the relations have been most cordial.

E. S. BURDELL.

The Librarian. Recovering well from last year's decline, the home use of the Library showed this year an encouraging increase, resulting in the largest total circulation yet recorded. Statistics of circulation by no means tell the whole story of the work done in any reference library; but they at least afford some clue to the extent to which the library is used. It may not be amiss, therefore, to look at the number of volumes borrowed over the past decade, particularly ten years ago, five years ago, and in the past three years:

	1925–26	*1930–31*	*1933–34*	*1934–35*	*1935–36*
Central Library	22,719	33,196	37,709	37,340	41,457
Branch libraries*	11,695	21,787	39,854	39,066	38,793
Total	34,414	54,983	77,563	76,406	80,250
* Walker Memorial circulation included above		2,042	13,544	12,885	15,040

The circulation from Walker Memorial Library is given additional mention in order to point out that this branch, providing almost solely cultural and recreational reading, accounts for 38 per cent of the branch libraries figure.

The above figures cover as usual one- and two-week circulation; 16,050 volumes additional were lent for overnight or week-end use, about equally divided between the Central Library and the branch libraries as a group.

Certain other statistics of the year's activity may be summarized briefly. Additions to the Central Library totalled 4,787 catalogued volumes, pamphlets and maps, to the branches 4,075, together 8,862, bringing the total contents of the Library to an estimated 315,431. The qualification "estimated" must continue to be used until the day when it is possible for us to finance a complete and accurate inventory. On inter-

library loan 250 volumes were borrowed from 49 libraries (22 university, 6 public, 7 society, 2 business, 8 national, 1 State); of these 205 were for members of the Instructing Staff and 45 for graduate students. Twelve hundred and nine volumes were lent to 149 libraries (57 public, 45 university, 32 business, 10 national, 5 institutional). Photostats were obtained for 53 borrowers. Two hundred and twenty-one suggestions for new books were received. The Reference Librarian kept statistics for one month last fall, showing 184 telephone calls received, 179 reference questions received, and 125 letters written, but for lack of time to maintain such a record it was not continued. The number of alumni registered as borrowers totalled 337.

The most notable event of the year was the improvement of the physical plant. The Central Library having lacked a ventilating system from the beginning, a modern heating and ventilating system furnishing filtered, heated and humidified air was installed and at once brought a vast change for the better in the atmosphere of the main reading-room, the stack and the work-rooms. The overhead illumination of the reading-room was stepped up by the use of thirty-two 1500-watt lamps, providing an average of fifteen lumens on the reading-tables. The installation of a speedy, self-levelling Otis elevator in the unused elevator shaft removed in large part the bugbear of inaccessibility due to slow elevator service, from which the Library had suffered. A new section, of 108 drawers, was added to the central card catalogue, increasing its capacity nearly one-third. In the space between the domes rough but serviceable iron shelves were erected to care for the Library's duplicate collection, and a much-needed stairway was put in to connect that floor with the main stack.

Credit for the suggestion which led to the three major improvements in the above list is due Dr. Howard Shapley, chairman of the Library Visiting Committee, who placed these outstanding needs of the Library before the Executive Committee of the Corporation. (See the first report of the Visiting Committee, in the *Technology Review*, November 1935, page 63.) Recognition is due also of our debt to George Wyman Hamilton, '80, out of whose generous bequest, made in 1934, the cost of these expenditures was covered.

To the Visiting Committee also, the other members of which were Walter Humphreys, '97, and Donald G. Robbins, '07, is due the suggestion of a "Friends of the Library" organization, which has been initiated under the sponsorship of the Alumni Association. Preliminary work done last spring under the immediate direction of its then president, Professor Moreland, has brought an encouraging response from interested alumni and friends, and a committee with John E. Burchard, '23, as chairman, was appointed to make plans for organization.

The faculty Library Committee consisted this year of Professor W. K. Lewis, chairman, and Professors Crosby, Ingraham, R. R. Lawrence, Mirabelli, R. S. Williams, and the Librarian ex officio. Its most important activity was the thorough consideration of the budget estimates for next year.

The routine work of the Central Library was restored to smoother functioning, almost on a pre-depression basis, by the provision of two general assistants, and the releasing of the Vail and Eastman assistants to their regular duties. Evening opening of the Central Library until 9 p.m. was restored at the beginning of the fall term, and the amount of patronage resulting seemed to justify this return to the former schedule.

The Reference Librarian reports an increased amount of work with freshmen, due in part to the growing practice of the English Department of assigning them subjects involving some library research. When the Department assigned the study of inventions and patents, we had cause to be thankful for the recent gift by the Social Law Library in Boston of six hundred and seventy-eight volumes of United States Patent Specifications, of which the Department and students made steady use for several months.

Vail Library service was this year brought even closer to the members of the Electrical Engineering Department staff by the systematic circulation of sixty-one periodicals to thirty-two men, this service being carefully supervised daily by the Vail assistant. Mrs. Lane, Vail Librarian, prepared a bibliography on Instrumental Analysis, to accompany Dr. Bush's Gibbs Lecture, and revised and completed Dr. Horton's bibliography on Physiological Electrical Measurements. An article by her, entitled "A Philosophy for the Special Librarian,"

appeared in the periodical *Special Libraries* of July–August 1935. The Eastman Librarian prepared a list of references on Theoretical Nuclear Physics and several such lists have been planned for the coming year. One- and two-week circulation in this branch showed a nineteen per cent increase; overnight circulation gained twenty per cent.

Two reading lists for alumni, annotated with extracts from authoritative reviews, were contributed by Miss Hazen to the *Technology Review*, namely, "New Pathways in Science" (March 1936) and "Planning for the Future: the Role of the Technical Adviser in Industry and Government" (July 1936).

Four members of the staff served on committees of library organizations. The Librarian was a member of the Library Planning Board of the Massachusetts Library Association. Mrs. Lane, as member of the Special Libraries Association Advisory Committee on the *Engineering Index*, attended its April meeting in New York. Three of the staff served on committees of the Special Libraries Association, Boston chapter, namely, Mrs. Lane as chairman of its program committee, Miss Chamberlain on its education committee and as local chairman of its College and University Departmental Librarians' Group, and Miss Colley on its membership committee.

Five staff members attended the conference of New England College Librarians at Amherst and South Hadley and had opportunity to study the new college library buildings at Massachusetts State and Mount Holyoke. The Librarian attended the Eastern Conference of College Librarians at Columbia in December and the American Library Association annual meeting at Richmond in May.

A library staff association was formed, with the especial object of promoting professional improvement, and four meetings were held. Various activities were undertaken, such as the circulation among the staff of books and periodicals dealing with librarianship, and a helpful program is being planned for next year.

Outstanding gifts this year were few. Of these, the following deserve special mention:

Mrs. Charles G. Weld presented to the architectural branch about two hundred and thirty volumes which had belonged to her late husband. These were in the fields of archi-

tecture, decoration, and furniture, and were in fine condition.

Mrs. H. H. Richardson presented two hundred and nine books, chiefly in physics, from the library of the late Professor Charles R. Cross.

Mrs. George L. Hosmer gave us ninety-five volumes, principally in the fields of geodesy and astronomy, from the library of the late Professor Hosmer.

Professor Karl D. Fernstrom gave us ninety-nine books that had belonged to his father, Henning Fernstrom, at one time an engineer of national reputation.

Among the many volumes by Institute authors presented for the Technology Collection, two deserve mention as somewhat out of the ordinary, namely, Professor Langley's album of quaint French portraits by Cassal, entitled "Romantic Figures in Pen andColor," presented by himself, and Dr. Hauser's comprehensive "Handbuch der Gesamten Kautschuktechnologie," in two volumes, presented by the publishers at Dr. Hauser's request.

Recommendations for the building up of the Library and the improvement of its service have been made in recent reports. The achievement of many of these aims awaits better financial conditions. Meanwhile it ought to be possible to prepare for better times by instituting a survey of the collections through departmental coöperation. If every department of the Institute can be persuaded to make a study, through an effective committee, of the authoritative literature in its particular field, the Library could check its holdings against this list and the department could present recommendations for systematic purchase. We would then be in a better position to round out the subjects now inadequately covered, whenever funds became available. This procedure was followed effectively by the Physics Department in making up its original collection for the Eastman Library.

The need of a monthly bulletin of information concerning new books and other resources of the Library, as a vehicle of closer contact with students and staff, has long been felt. Such a bulletin should be planned on a basis of the utmost practical serviceability to undergraduates, graduate students, the Instructing Staff, and alumni. It should contain not merely lists of new books but news items concerning books, authors,

periodical articles and the services rendered by the Library. There should be frequent bibliographies on timely subjects, not only in science and engineering but on civic and cultural matters, and helpful contributions from the Instructing Staff, in their special fields. The Librarian and staff stand ready to give their time to this undertaking whenever funds for printing it can be found.

One hesitates to suggest increase of staff at the present time, but, looking to the near future, it should be said that an additional reference assistant will be needed in the Central Library, since the present necessity for taking a cataloger from her work to do reference work part time is unsatisfactory at both ends. The Economics Library needs a half-time trained assistant and before long the Stack Custodian should be restored.

It is perhaps hard for anyone not on the Library staff to realize that the Institute Library has been developing steadily into a university library, in fact if not in name. Yet it is true that the present wide scope of the Institute's activities, in teaching and in research, the notable increase in graduate enrollment, and changing methods in teaching, have brought upon the Library a widening range and growing volume of demand which can be adequately met only by frank recognition of the corresponding responsibility involved.

W. N. SEAVER.

Industrial Cooperation. During the year the Division of Industrial Coöperation has increased the amount of its business with an accompanying increase of income and therefore of funds available for the support of research problems.

The process of differentiating between routine testing and work of a research type has gone on and practically all of the routine testing work, excepting where our possession of unique facilities makes it necessary for us to carry it out, has been transferred to outside commercial testing laboratories.

Most of the serious research problems which were enumerated last year have been continued, including the study of the corrosion resistance of some alloy steels; investigation of the conditions necessary for preservation of domestic food

supply; the study of warp sizings for textiles; and studies of the resistance of structures to earthquakes. The equipment for the study of the creep or flow of materials at high temperature has been materially increased and the research upon that subject has been greatly enlarged during the year. The researches upon the development of new refractory substances and upon the resistance of masonry to the action of water have progressed to the point of giving very definite practical results.

The work of the Committee of the Division in preparing a plan for the reorganization of the engineering and technical departments of the City of Boston has been completed and submitted to the mayor.

There has been a marked increase in the development of patentable inventions on the part of the staff, many of them carried on in connection with the activities of the Division. The matter has now become sufficiently important so that special administrative action has been taken to handle it.

The Placement Bureau. The demand for Technology graduates during the year has been greater than at any time since 1929, and many of the 1931 and 1932 graduates who were unable to find employment at the time of graduation have now found satisfactory openings in fields closely allied to their Institute training. Frequently difficulty is experienced in finding properly qualified graduates for many of the openings brought to the attention of the Placement Bureau. This is especially true of the more recent classes. Here experience that has been difficult to secure during the last four or five years is required.

All phases of the work of the Placement Bureau have shown increases during the year. More placements were made than during the previous year, and more of the experienced alumni keep their experience records on file with the Placement Bureau. The number of requests for graduates has increased greatly.

The effort spent on the proper placement of current graduates during the last three years has produced very encouraging results. At the time of commencement this year 78 per cent of the graduates were settled for the coming year, as compared with 70 per cent at the same time in 1935. At present there is a shortage of graduates of Mechanical, Metallurgical, and Chemical Engineering, with the greatest demand for those who

hold the Master's degree. At present writing, only 3 per cent of the 111 awarded Master's degrees in June are now without satisfactory employment.

C. L. NORTON.

Society of Arts. The 1935–36 series of Popular Science Lectures given under the auspices of the Society of Arts on Friday and Saturday afternoons for the benefit of pupils of the secondary schools, and on Sunday afternoons for the general public were attended by the usual large and appreciative audiences. The subjects of the lectures were chosen in part with reference to current work being carried on in the research laboratories of the Institute, as one of the purposes of the lectures is to present to the public recent advances in science and technology.

The subject of ceramics was presented for the first time in these lectures, as much interesting research is being carried out in the Ceramics Laboratory — now open to students in the Graduate School. The results of the extensive researches which have been carried on for several years on the nature and dissipation of fog at the Round Hill Research Laboratories on the estate of Colonel E. H. R. Green were shown for the first time in a lecture hall, and illustrated by striking and beautiful experiments. Other subjects chosen dealt with Modern Methods of Illumination and The Chemistry of Explosives, with particular emphasis on their importance and wide use in engineering operations, and illustrated by motion pictures kindly furnished by E. I. duPont de Nemours and Company.

The complete lecture schedule was as follows:

December 13, 14, 15	EXPLOSIVES AND EXPLOSIONS. By Ernest H. Huntress, Ph.D., Associate Professor of Organic Chemistry.
January 17, 18, 19	CERAMICS AND SOME SECRETS OF THE POTTER'S CRAFT. By Frederick H. Norton, S.B., Associate Professor of Ceramics.
February 7, 8, 9.	LIGHT AND SIGHT AND RELATED PROBLEMS IN ILLUMINATING ENGINEERING. By Parry H. Moon, S.M., Assistant Professor of Electrical Engineering.

March 6, 7, 8. FOG — ITS PHYSICAL PROPERTIES, PENETRATION BY LIGHT AND RADIO WAVES, AND LOCAL DISSIPATION.
By Edward L. Bowles, S. M., Associate Professor of Electrical Engineering; Henry G. Houghton, Jr., S.M., Research Associate in electrical Engineering; William H. Radford, S.M., Research Assistant in Electrical Engineering.

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

Medical Director. The work of the Department of Hygiene has been carried on without any serious defect during the year. There were 18,457 visits made to the Infirmary during the year as follows:

Daily Clinic Calls

July	447	January	1,563	
August	400	February	1,342	
September	713	March	2,384	
October	3,186	April	2,026	
November	1,590	May	1,417	
December	1,383	June	820	
				17,271

Hospital Cases

Bed Patients	315	
Out-patients	871	
		1,186
Total		18,457

Cases Summarized

Surgical	8,855	
Medical	5,624	
Contagious	32	
Physical examinations (complete)	905	
Physical examinations (reëxaminations)	1,285	
Excuses issued	1,756	
Total		18,457

(1210 men showed physical defects on examination.)

Two deaths occurred during the year.

The average weight of the student was 147 pounds, and the average height 5 feet 9 inches. An average of 2¾ days per student was lost because of illness.

During the year there was completed in the Pathological Laboratory a total of 787 blood counts, cultures, and miscellaneous analyses.

The Director of Physical Training reports that for the first term of the year 206 men took Physical Training, 369 substituted one of the various sports, while 38 substituted but later dropped sports, and 24 were excused from all exercise. During the second term, 177 took Physical Training, 347 substituted sports, with 32 substituting and later dropping out, and 25 men were excused.

These figures do not include makeups in gym classes for cuts in the various sports.

For the first time men were given four opportunities to sign up for sports during the year instead of two as in previous years. A month after the original sign-ups the lists were opened again for any who might wish to substitute sports and the same privilege was allowed the second term. The number who availed themselves of this opportunity proved to be very small.

The work in the gym classes was unusually good and might possibly account for the excellent marks in the Cabot Medal Tests.

Quite a few upperclassmen took advantage of the Physical Training classes and we find that their number is increasing each year.

No serious epidemic has occurred during the year, the work of the Department has gone very smoothly and the average health of the student body has, I believe, been improved.

As to suggested improvements for the coming year, I should like to have an X-ray taken of the lungs of each new student entering the Institute, since every year one or two cases of tuberculosis appear. These cases were not found on examination and could not be diagnosed or anticipated without the use of X-rays. I feel that if the life or health of one or two students a year could be saved or prolonged by this method the expense and work involved would be well worth while.

I still feel that we should have a psychiatrist and I hope that at some time in the near future we may have a dental service. I also believe that a swimming pool would be a great advantage.

GEORGE W. MORSE, M.D.

News Service. The year has witnessed a number of noteworthy developments in the news field that have already had an important and favorable influence on the Institute's publicity. Particularly significant is a wider publication of the more serious and less spectacular science and engineering news by editors who hitherto have been interested chiefly in the sensational.

Another advance which seems certain to become increasingly important in the distribution and presentation of information is the development independently of several methods of transmitting photographs over telephone circuits from any telephone instrument. The possibilities of this development beyond routine newspaper use are indicated by an increase in the number of special publications devoted almost entirely to the presentation of news in the form of photographs.

As a result of the widespread coverage given by the news and photographic services, and the highly competitive nature of the business, news pictures which once were given only local or regional distribution by mail are now transmitted nationally by wire. The recent announcement of the new X-ray generator designed at the Institute for the Huntington Memorial Hospital, and a photograph of the apparatus, were in the offices of Pacific Coast newspapers less than four hours after their release in Cambridge. By distributing four photographic prints to the leading news picture systems it is now possible to cover virtually every daily and Sunday newspaper in this country and Canada within a period of six hours.

In the opinion of the various news service and newspaper science editors who have visited the Institute during the year public interest in science news is increasing and more editors are giving attention to the public taste in this field. The very active work of the American Association of Science News Writers is an important influence in the interpretation of progress in science and engineering in the technical educational field, as well as in industrial research.

During the year the News Service has distributed nearly thirteen hundred news stories, ranging from the individual home town story on scholarships and Dean's List honors to important developments in the Institute's laboratories.

European interest in American science news and photo-

graphs has increased steadily in the past three years and the News Service now has eight distribution outlets in England and Europe for its news releases and photographs. Dr. Edgerton's high speed photographs continue to hold first interest in the photographic field, with developments in the high voltage program leading in news demand.

Writers in various fields of science and engineering continue to find the Institute a rich and friendly source of authoritative information. Members of the staff have coöperated and have given generously of their time in this pleasant and valuable aspect of the Institute's public relations. It is interesting to note here that as a result of this coöperation a number of authors of secondary school textbooks have not only employed material relating to the Institute's work, but have used photographs of important research projects to illustrate progress in various fields.

Under the continuing arrangement with the *Technology Review* the News Service coöperated in contributing material for the Institute Gazette section of the magazine. By this means some fifty-five thousand words of Institute news of special interest to the alumni was published during the year. The cordial coöperation of the staff of the *Technology Review* enabled the News Service to make public interesting material that would not otherwise have been available, and the widespread attention directed to the Institute by articles appearing in the magazine has added considerably to its prestige.

Last winter for the fourth year the News Service presented a series of popular science experimental lectures for high and preparatory school students. The program of four lectures covering chemical engineering, the use of scale models in engineering research, modern physics and biology was arranged by a committee composed of Professor J. R. Markham, chairman; R. M. Elliott, E. R. Gilliland and C. G. Dunn. The lecturers, Professors Ernst A. Hauser, John C. G. Wulff, Kenneth C. Reynolds and Bernard E. Proctor, went to much trouble to present their subjects in the most interesting form. As a result the series drew the largest attendance since the program was started, bringing a total of 2,405 students from 133 high and preparatory schools, as compared with 1,186 last year.

Demand for the Institute's films produced by the Division

of Visual Education, the distribution of which has been in charge of the News Service, continues to increase. Because of the limited number of films available and the fact that they are used for teaching purposes at the Institute, no effort has been made to attain distribution on a large scale.

JOHN J. ROWLANDS.

SCHOOL OF ENGINEERING

Aeronautical Engineering. The course is planned for a limited number (about thirty per year) of especially qualified students who can assimilate in four years the essentials of mechanical engineering and, at the same time, the fundamentals of aeronautical science with some introduction to its application. Each year about twice this number apply, but it seems wiser not to accept more students for undergraduate work. Others may prepare themselves in mechanical, electrical, or civil engineering and leave aeronautical specialization for later graduate study. It is recommended that the number of undergraduates remain fixed as at present for Course XVI, but that there be no restriction on the number of graduate students.

During the year our students have been easily absorbed by the growing aeronautical industry, but there is already a visible tendency in other educational institutions, in response to student enthusiasm, to offer unrestricted aeronautical courses to more undergraduates than can be employed.

During the year Professor Townsend of the Mechanical Engineering Course has assisted Professor Koppen in introducing more work on the elements of machine design in the time allotted to airplane design and the summer shop work has been revised to include an intensive course of instruction in the operation of machine tools. These changes are the result of a demand from industry that an aeronautical engineer must, first of all, be a competent mechanical engineer. Modern airplanes are built of metal and with increasing complexity.

New equipment during the year included a small wind tunnel for the study of the mechanism of boundary layer phenomena, an electrical circuit using vacuum tube oscillators for the rapid evaluation of the equations of motion for a pitching

airplane in flight, a precision machine shop, and a general machine shop for the unrestricted use of students for their own apparatus construction.

Research has been carried forward by staff and graduate students on a number of projects financed by outside agencies, including a study of boundary layer mechanics, a study of the acoustic altimeter, and tests on the stability of stiffened curved sheets for the National Advisory Committee for Aeronautics. The Navy Department has supported work on engine and airplane vibration recorders and on the strength of stiffened shells. For the industry, studies and wind tunnel tests have been made for a projected transport airplane, a bomber, a large flying boat, a light amphibian, a sport plane, and a fighter.

Members of the staff have continued their useful coöperation in the solution of the technical problems of the industry. Professor Newell, for example, spent the summer with the Engineering Department of the Army Air Corps in a comprehensive review of the position as regards the coördination of test and theoretical data on metal airplane construction. Professor E. S. Taylor worked with the Wright Aeronautical Company on engine vibration and Professor Draper and Mr. Bentley with the Naval Aircraft Factory on vibration measurement.

Five textbooks are being prepared to cover the material of the principal courses on structures, engines, aeromechanics, aerodynamics, and instrumentation. Reports of research by the staff were published by Professors Smith, Koppen, Ober, Newell, E. S. Taylor, Markham, Draper, and Peters.

The graduate course in instrumentation has been expanded to cover two terms with parallel laboratory work in the special Instrumentation Laboratory set up by Professor Draper. The M. I. T. Recording Torsiograph has been adopted by several units in the industry and arrangements have been made for its manufacture and sale, on a royalty basis, by the Sperry Gyroscope Company.

Designs have been prepared for a high speed wind tunnel which is urgently needed to keep abreast of the rapid increase in airplane performance. Our present wind tunnels are satisfactory for teaching, but are now obsolete so far as furnishing trustworthy data for the design of modern airplanes. The need

for modernized wind tunnel equipment was considered at a special meeting of the Visiting Committee of the Corporation.

The graduate course in theoretical aerodynamics given by Professor Smith has been extended from one year to two years to permit consideration of unsteady flow (flutter and landing phenomena), spinning and compressibility effects. The graduate enrollment is increasing in view of the demand for men of advanced scientific training for research and development work.

J. C. HUNSAKER.

Building Engineering and Construction. The discouraging conditions of the last few years in the building industry are reflected in a decreasing enrollment in this course, although it is hoped that the indicated revival of the industry may stimulate a larger interest in due time. Ten of the thirteen members of the senior class found employment before graduation and two are returning for graduate work.

The course schedule, which has been revised to provide for group electives in the junior and senior years, in four major fields, will, it is believed, greatly stimulate the interest and initiative of our students. While retaining the fundamental requirements in mathematics and science, the student will be allowed to specialize in the following fields, (1) Building Construction itself; (2) Management and Planning as related to the management of buildings and realty developments; (3) Research in Materials; (4) Structural Engineering as a profession.

Professor Voss, assisted by Mr. H. R. Staley, Research Assistant, is continuing his study of the permeability of masonry walls, which has already resulted in a distinct contribution to the understanding of a proper specification for insuring weather tightness in brick work, a matter that has vexed the building industry for many years. His research this year will center around (a) Continuation of petrographic and X-ray studies of the "bond layer"; (b) Earthquake effects on brick masonry; (c) Volume changes in mortars and concrete which have lime additions; (d) Study of workability by means of a new extrusion-energy machine now being constructed; (e) Study of bond between matrix and aggregate in concrete.

ROSS F. TUCKER.

Business and Engineering Administration. Other than the normal advances made in teaching methods, the constructive activities of members of the Department have currently been centered upon the following five objectives: the increase of student contacts with industrial establishments and executives, the development of closer relationships between students and teaching staff, the completion of the present departmental publication program, the revision of the departmental curriculum to accord with the recommendations of the Faculty Committees on Undergraduate Courses, and the presentation of new subjects.

Plant visitations have, from the beginning, been incorporated as requirements in various parts of the course. In recent years, arrangements have been made whereby seniors in groups of four have each term made extensive reports upon plant visitations to coöperating industries in greater Boston and vicinity. During the year, this procedure was extended into the junior year with marked success and it is planned to advance the method into the sophomore class. An extensive survey of industrial establishments was conducted by H. T. Smith and H. G. Scowcroft, and at present, somewhat over one hundred companies are actively participating in this program.

A second influence for closer student contact with executives has been a series of meetings organized by Professor Fiske which have enabled each member of the senior class to join at least once during the school year a small number of his classmates in a dinner with a business executive, followed by a general and informal evening discussion of industrial conditions and problems.

A third approach to this objective has been through the recently organized subject, Industrial Problems, required of all departmental students in the second term of the senior year. In this program, industrial administrators have collaborated in presenting to the class a contemporary problem which has confronted them. One period is spent by the administrator in discussing the problem with the class prior to their report upon it; a second hour is given to small group discussions between students and departmental staff; and in a third hour the administrator reviews reports which have been submitted by students, and presents his own decisions and the reasons therefor. Dur-

ing the year ten such presentations were made by collaborating presidents and vice-presidents of New England industries.

A fourth activity consisted of a series of dinner meetings with industrialists arranged by the chairman of a graduate student committee which brought close and frequent relationship between departmental graduate students and business men.

In all of these undertakings, the cordial coöperation of industrial establishments and officials, through generous contributions of their time and counsel, has brought new and important resource to the department.

The development of closer relationships between students and teaching staff has been furthered by dinners given by the department to freshmen electing Course XV and to sophomores entering the course, as well as a series of gatherings for upperclassmen held in the homes of staff members. In addition, plans outlining the further capitalization of the third floor and the basement in Building One for study areas in proximity to staff offices was submitted to the administration for inclusion in the general program of spatial rearrangement.

The present publication program to which each departmental professor contributed either textual or reference material was completed with the publication during the year, of the two books, "Organization and Management of a Business Enterprise" and "Administrative Proficiency in Business," both of which are enjoying a gratifying reception. Additional texts, enlarging the program, are now in preparation.

Because of the dual nature of the Course XV curriculum which places emphasis both upon engineering and business, the problem of conforming to the recommendations of the Faculty Committee on Undergraduate Courses regarding the limitation of subjects per term was particularly exacting. Credit is due to Professor Elder for proposals leading to the increase of hours given to fundamental business subjects, and to the introduction of elective opportunities in subsequent terms. Thus the coherence and unity of the basic treatment is strengthened, and later subjects benefited by greater accord with individual student interest. We are appreciative of the fine spirit of coöperation extended by the Departments of Chemical, Civil, and Mechanical Engineering in dealing with the inevitable readjustments of technical subjects to which our new curriculum gave rise.

Mr. H. T. Smith, in conjunction with Mr. Archibald Williams of the Hood Rubber Company, organized an evening course in "Motion and Time Study" available for production executives employed in nearby industries. The success of the course prompted its repetition during the early summer.

It is proper at this time to review the progress of seven activities auxiliary to teaching which have been inaugurated since the establishment of the Department in 1930 and which have been subsequently maintained as a part of our program.

Six years ago a New Year's Business Conference was inaugurated for the interest and benefit of Course XV graduates in the New England area. These conferences have elicited favorable response since their inception and have now come to be looked upon as a departmental tradition. Their evolution has been toward greater informality with increasing opportunity for discussions, many of the papers presented being subsequently printed in the *Technology Review*. The sixth conference held this year had for its general topic, "Encountering Prosperity" and was attended by men from the New York as well as New England area.

Five years ago, through the generosity of Mr. Alfred L. Loomis, a member of our Corporation, a specially constructed bus, affording facilities for food and lodging as well as transportation, was made available for a student tour of American industries. The success of this venture resulted in a repetition of the trip on the succeeding year, after which the idea was extended to a European industrial tour, the first of which occurred in 1933. This year witnessed the fourth of such foreign visitations, making this opportunity available, over the period, to a total of eighty-one students. During this interval, the following countries have been visited on one or more occasions: Austria, Belgium, Czechoslovakia, Denmark, England, France, Germany, Holland, Norway, Scotland, Sweden and Switzerland. Institute graduates in these countries have served as intermediaries in introducing students to industrialists, and much credit is due these graduates for the continued success of the project. The itinerary, under the supervision of H. P. Meissner and R. D. Williams, included for the second time the Scandinavian countries as well as England, France, Germany, Scotland and Switzerland. Eighteen industries, and an equal

number of centers of historical or cultural interest, were visited.

Five years ago, an Honorary Sponsorship program open by invitations to graduates of other departments in the Institute and other technical schools was undertaken under the immediate supervision of Professor Raymond. Organized for the purpose of fitting young men of exceptional proficiency for administrative positions in industry, the plan incorporated special facilities for dinner meetings and evening discussions, first at the Hotel Fensgate and later in Ware Hall of the Graduate House. The weekly conference with a distinguished administrator has been a continuing feature of the programs. During the year nineteen chairmen of boards or presidents and five vice-presidents or general managers met with the fifth Sponsorship student group. Thus far, thirty men, largely Institute graduates with one or more years of industrial experience, have availed themselves of the program.

Although organized correspondence with all graduates of Course XV was initiated as early as 1920, the first extensive survey of the industrial program was made five years ago when over 85 per cent of the course alumni responded to a comprehensive questionnaire. These data were transferred to tabulating cards and formed the basis of an illuminating study of subsequent achievement and its correlation with scholastic standing, extra-curricular activities and other characteristics. This year, a similar survey covering the experience of all graduates during the past five years is in progress. Data have again been collected from each class and the ensuing report will be circulated to all participants.

Five years ago, a series of industrial addresses by distinguished administrators was instituted for the benefit of students of the Department and others interested. Since its inauguration, six industrialists have given addresses, the sixth presentation last year being made by Werner T. Schaurte, President of Bauer and Schaurte, of Neuss, Rhein, Germany.

Five years ago, an arrangement was effected permitting all freshmen electing Course XV to avail themselves of aptitude tests designed to indicate their relative fitness for the work of this Department. The experiment was undertaken over a period of three years and then discontinued due to overreliance

of students upon indicative data, and the misinterpretations of test findings by parents. This year the proposals of the Faculty Committee on Stabilization of Enrollment again arouse hope that a more effective method may be found of including in the course only those students who in point of personality and character as well as intellect, show promise of later administrative proficiency.

Four years ago, the Department undertook a formalized schedule of placement training for its seniors and graduate students. Professor Fernstrom, as registration officer for the graduating class, assumed responsibility for the detailed administration of the program. As a result, more than one-half of these students procured employment before graduation. The general scheme was subsequently extended to all Institute students. This year Professor Fernstrom again took charge of the placement of seniors in collaboration with the central placement bureau, and he reports that of the sixty-two graduating from this Department but one remains unemployed.

ERWIN H. SCHELL.

Chemical Engineering. The year was characterized by an unusual rise in student enrollment in Chemical Engineering, notable particularly in post-graduate work. The 44 per cent increase this year in the number of men working for advanced degrees, following upon a 30 per cent increase during the previous year, emphasizes the need for again considering future policies. Placement of the graduating class has been exceptionally good this year, 95 per cent of the men being located by midsummer. Coupling this with evidences of the growing importance of chemistry in industry, we feel that there will be enlarged opportunities for well-trained Chemical Engineers in the future and that the present increase can fairly be regarded as a healthy development. On this basis, the Department feels the importance of making provision for strengthening its personnel and facilities in order to maintain and improve the quality of its instruction.

The School of Chemical Engineering Practice has had a highly satisfactory year. The number of qualified applicants was so large that it became necessary to form an extra group of

graduate men, following a special schedule from February through July. While this procedure involved some additional staff expense, it seems preferable to operating with larger unit groups and risking impairment of the quality of the work. Forty-seven post-graduate and twenty senior students took Practice School work during the year. The Practice School students coöperated in a study of high temperature furnace performance and design by securing remarkably accurate test information on steel reheating furnaces. These data have been incorporated in a paper from the department which considerably extends our ability to design high temperature furnaces.

The Senior Honors Group plan was continued for its third year, with certain modifications in the program indicated by earlier experience. This plan, which attempts to develop professional initiative and maturity among a small selected group by giving them special treatment, seems inherently sound and is giving better results with each year of operation.

A new graduate course on the analytical treatment of chemical engineering processes, aiming to develop the ability to employ mathematics in professional problems, has been introduced this year.

Special activities by members of the staff included organization and leadership of the first symposium on radiant heat transmission before the A.S.M.E. and major responsibility for organizing a chemical engineering symposium on heat transmission. The Department contributed a number of papers by special request, including two before the World Power Conference at London in June. The practice of arranging talks for post-graduate students by prominent engineers and industrialists, initiated last year, was successfully continued and enlarged this spring.

The continuing program of research on clays has focused largely on the study of gelation and the structures of gels, with special emphasis on the laws which govern the settling of plate-like particles. Work has been done on extending the ranges of the torsion viscosimeter and of the falling ball method for measuring rate of gelation. Studies were carried out on the effect of temperature on the gelation of various materials and on the influence of addition agents on the plasticity of clay suspensions. The effects of thermal decomposition on the physi-

cal properties of clays, particularly as regards plasticity, have been investigated as a means of uncovering differences between various types of clay. Similarly, the removal of metals from clays by acid washing and dialysis have disclosed significant results. It is hoped that this work, tying in with Dr. Hauser's program as given below, will lead to a deeper insight into gel structure.

Study of the flow characteristics of asphalt has permitted the development of a technique for measuring the viscosity and plasticity at normal temperatures which not only aids in evaluating asphalts but gives an insight into their structure and properties.

The work on olefins, both at ordinary pressures and in the high pressure laboratory, has concentrated largely on a study of the reactions from the point of view of their control to give specific products. The techniques which have been developed permit the hydration of unsaturated gases to form alcohols or ethers as desired and the control of processes of polymerization.

Remarkably high rates of heat transmission have been secured in the investigation of falling films obtained by flowing water down vertical tubes. This procedure permits more efficient performance than is obtained with the usual full-flow tube in commercial condensers. Studies of drop-wise condensation, extended to full length tubes, show that the beneficial effects which had previously been found on small tubes can be secured on commercial size equipment.

An instrument has been developed for measuring the flow of heat inside the combustion chambers of furnaces which should greatly facilitate the study of industrial furnace performance. The work on the mechanism of combustion of carbon has been continued by a third paper dealing with the basic nature of the action around a burning particle. A highly significant contribution has been made in a paper which presents the basic thermodynamic charts for the working fluid at the high temperatures of an internal combustion engine cycle. The method should permit calculations for internal combustion engines, taking account of incomplete chemical reactions, which are nearly as simple as calculations of the steam engine cycle with steam charts.

The Department's research activities were enlarged by

the advent of Dr. Hauser, who has initiated a number of projects in applied colloid chemistry. Noteworthy results have been secured in the adaptation of the Edgerton high speed motion camera technique to surface phenomena such as the measurement of surface tension by the falling drop method. The surprising results of this work lead us to anticipate valuable contributions as it is further extended. An elaborate program of fractionating fine clays by the super centrifuge and dialysis, with an accompanying mathematical interpretation of the data, has given products of narrow size range and unique properties. Other interesting problems have dealt with the fluorescent light microscope as a potential tool for studying colloidal reactions, *e.g.*, adsorption on solid surfaces, the depolymerization of rubber latex, and the explanation of the transparency of rubber when compounded with certain ingredients.

Mention should be made of the interest and activity exhibited by the Department's Visiting Committee, which has contributed significantly to the development of future policies.

WALTER G. WHITMAN.

Civil and Sanitary Engineering. The professional training in the Department is centered in four divisions: Structures, Transportation, Hydraulics and Hydraulic Engineering, and Water Supply and Sewage Disposal. While the program of instruction in each of these divisions has been developed throughout a fairly long period, nevertheless there are further developments which we believe are desirable.

The program in Structural Theory is intended to teach thoroughly the principles of structural analysis and to give as much training in the application of these principles as the time available permits, but additional opportunity for study might be offered through the establishment of a structural laboratory containing equipment for mechanical analysis and by making greater use of the facilities of the Departments of Mechanical Engineering and Mathematics for the study of Photoelasticity and Theory of Elasticity.

Instruction in the transportation field has been progressively modified to keep pace with the rapid changes taking place in this field. Originally emphasis was given to railroad engi-

neering, later an option in highway engineering was added, and as these fields grew the two options were consolidated in one broad course in transportation engineering embracing the fundamental principles and coördination of railroad and highway transportation and their relation to other transportation agencies by air and water. In recent years more emphasis has been given to the economic and social phases of transportation and less attention to engineering details: routine laboratory instruction in highway materials has been curtailed. There is need for further laboratory research of an original nature particularly in the field of rational design for flexible pavements; this the Department hopes to develop. Recent research has been in the field of economic and social problems.

The program of instruction in theoretical hydraulics is probably well fitted to the needs of undergraduate students but the instruction might be improved by the use of equipment for classroom demonstration; a plan for this addition is under consideration by the Department. Training in Hydrodynamics, essential for students specializing in this field, is obtained in the Department of Mechanical Engineering. The field covered in Hydraulic Engineering is limited to consideration of Hydroelectric Engineering, the hydraulic problems involved in Water Supply and Sewage Disposal and those involved in the development of rivers and harbors. Flood control problems will be given greater consideration than they have received in the past.

The instruction in Water Supply and Sewage Disposal is believed to be carried out as well as limitations of available laboratory equipment permit. It is desirable to supplement the present classroom work by additional laboratory demonstration and student research as equipment becomes available.

The only changes in the normal activity of the Department since the last report are those resulting from a considerable increase in the number of graduate students and those due to the critical study of the curriculum for the third and fourth years. This study has led to changes in the curriculum and to a revision of subject matter and methods of teaching designed to give more opportunity for the development of initiative on the part of the student.

An increase in the number of officers of the Corps of Engineers of the United States Army sent to the Institute for further

training has made it desirable to arrange a program of instruction for these officers as a group, the program leading to the degree of Master of Science in Civil Engineering.

Professor Carlson has been on leave of absence at the University of California. He has visited many cement plants and the major concrete structures in Europe during the summer and returns this fall to resume active research work in cements.

Coöperation between members of the Department staff and outside interests has continued. Professor Spofford has been consultant on the Clinch River Bridge constructed by the Tennessee Valley Authority, to the City of Boston and the Department of Highways of the State of Maine in connection with the replacement of bridges destroyed by the floods of last spring. Professor Barrows has acted as consultant to the National Resources Committee on Drainage Basin Studies for New England, and has been Chairman of the Water Resources Committee of the New England Regional Planning Commission. Professor Breed has been consultant for the Department of Public Works of the State of Massachusetts. Professor Babcock was President of the Boston Society of Civil Engineers during the past year, and Professor Barrows is to serve in this capacity during the coming year.

The program of research on quiescent settling of suspended particles in water and on short-circuiting in miniature and large settling tanks has been continued; it has led to interesting and valuable conclusions and has opened up a fertile field for additional investigation. Further study on hydraulic losses in side channel spillways is also being carried out. A miniature water filtration plant consisting of a mixing chamber, a settling tank and a rapid sand filter has been constructed for experimental and classroom demonstration purposes.

The program of investigation with respect to the stability of water towers during earthquakes has been continued and it is believed that sufficient information has been obtained to provide a rational basis for the design of quake-proof towers. The Department is indebted to the Chicago Bridge and Iron Works and to the United States Coast and Geodetic Survey for their support of the research on earthquake problems.

The Wilbur simultaneous equation machine has been completed. The machine solves nine simultaneous equations with

reasonable accuracy and may be operated to obtain solutions for larger groups.

Three soil consolidation machines of the latest type and a new friction machine have been designed and constructed in the Soil Mechanics Laboratory, also a consolidation machine of special type which permits application of loads to inner and outer portions of the sample directly.

The River Hydraulic Laboratory has continued model studies of several problems on the Cape Cod Canal models for the United States Army Corps of Engineers. Professor Hazen, of the Electrical Engineering Department, developed a unique and successful water-level recording equipment for one of the models which has made it possible to reproduce with considerable accuracy the natural tidal effects in the Canal. Studies have also been made in the laboratory on the drag of fish nets and of the action of waves on sea walls.

Numerous papers written by members of the Department appeared during the year in professional journals and Professor Peabody has published a book entitled "The Design of Reinforced Concrete Structures."

CHARLES B. BREED.

Electrical Engineering. There have been no major changes in policies or fundamental activities during the course of the year.

The revision of the undergraduate curriculum referred to in previous reports continues to be one of the important activities of the Department. The introductory subject matter given to sophomores in the second term has now been taught two years in the revised form. New curriculum notes were also used for the junior students. This material will be still further revised before it is used again next year. Notes are now in process to be used in the first term of the senior year. This will complete the first draft of the material for the basic course. The development of the new notes has progressed satisfactorily with the whole-hearted coöperation of the staff. By successive revisions, based on the experience gained in the first rounds of teaching the material to classes, it is believed that within two or three years a very significant treatise on electrical

engineering will have been developed from this revised curriculum, reflecting the coördinated ideas of a varied staff.

The work of the Measurements Laboratory has been reorganized for the purpose of coördinating it closely with the revised curriculum for the sophomore and junior students. This work is now all of the project type and the method seems to be effective in arousing and holding the interest of the students.

Considerable thought is being given to instruction in electrical engineering to students majoring in other courses. Too many of these students now feel that they have no direct interest in electrical engineering. The problem is to arouse their interest and to give them an understanding of the basic principles of electrical engineering and some knowledge of the application of electrical equipment and electrical measuring devices which will be useful in their own particular fields. A beginning has been made by introducing the project method of laboratory instruction for these non-electrical students on an optional basis. A series of projects were developed which are designed to acquaint the student with applications of electrical machines to various industrial problems as well as to lead to a consideration of operating characteristics, and to acquaint the student with routine methods of testing. These optional projects were selected by many of the students in place of the regular and more routine laboratory experiments heretofore offered to this group of students and have stimulated considerable interest among the students who have attempted them. This plan will be further extended.

The new option "Illuminating Engineering" (VI-B) was offered for the first time. The number of students registered was small, but the work done was of a high order.

The two new advanced subjects, "Mathematical Analysis by Mechanical Methods" and "Super High Voltage Engineering," attracted a number of advanced students and established the fact that they have a valuable place in the curriculum.

The Honors Group Plan for selected students of the junior and senior years, with associated plan of comprehensive examinations, continued to show good results. The seminar method of instruction for the Honors Group was extended to include seminars in Political Economy and Mathematics conducted by members of the staff of the Economics and Social Science

Department and the Mathematics Department respectively.

In the Coöperative Course (VI-A) the General Electric Company resumed the practice of offering opportunities for industrial experience at the works to students taking the Manufacturing option, and those taking this option had their full quota of such experience during the year. On account of business conditions, students taking the Public Utilities and Communications options could not be given suitable opportunities for practical experience and were, therefore, given additional engineering courses at the Institute. It is hoped that improvement in business conditions may make possible resumption of full industrial coöperation in the near future.

The members of the staff of the Electrical Engineering Department supervising our coöperative work with the General Electric Company also administered the coöperative work of students of the Mechanical Engineering Department taking similar work with the General Electric Company.

During the year six colloquia for seniors and graduate students were held. One of these colloquia, led by an able patent attorney, was on the subject of "Patents and Patent Law"; the other five were led by representatives of the research and development departments of large manufacturing companies in various fields.

Mr. L. V. Bewley of the General Electric Company, through the kindness of that Company, spent two weeks during the second term as the joint guest of the Departments of Electrical Engineering of the School of Engineering of Harvard and of the Institute. He conducted a series of coördinated lectures and conferences on the application of tensor analysis to engineering problems, on traveling waves and on transmission line protection and coördination.

We now have with us Professor A. Pen-Tung Sah of Tsing Hua University who is conducting a series of conferences on the application of the matrix, tensor and dyadic methods of analysis to electrical engineering problems.

Progress was made in many researches, including those on local dissipation of fog, on high-voltage electrostatic machinery and vacuum insulation, on sputtering, and in the application of high-speed photography and high-speed motion pictures to research problems.

An extended research has been undertaken in coöperation with the Utilities Coördinated Research, Inc. (Association of Edison Illuminating Companies) to investigate the mechanism of deterioration of insulating oils by processes related to oxidation. Two full-time research assistants were engaged on this work which will continue for at least another year.

The Department has coöperated with the Physics Department and the Huntington Memorial Hospital in the design and construction of a one million volt X-ray machine to be used in research in the treatment of cancer. Construction of the unit is nearing completion at the Huntington Memorial Hospital.

The development of the subject of radio-frequency measurements and the technique of the generation of ultra-high frequencies and instruction in this general field have all been much aided through the helpful coöperation and support of the General Radio Company of Cambridge.

In the field of electrical communication, Dr. W. L. Barrow presented a paper in Washington at a joint meeting of the Institute of Radio Engineers and the International Scientific Radio Union covering the transmission of energy through hollow tubes by means of electromagnetic waves of ultra-high frequency. This significant contribution to the radio frequency art may have an important bearing on communication over great distances, particularly in the field of television. It is interesting that the Bell Telephone Laboratories announced their completely independent work on this identical subject at the same time.

Work on the development of the cinema integraph has continued and the indications are that the machine will be available for use in the solution of problems during the coming term.

Dr. Harold L. Hazen coöperated with the Department of Civil Engineering in the Cape Cod Canal model testing by developing electrical apparatus for controlling water levels at the two ends of the canal to simulate tidal variations in the two bays, and for recording the water levels at various points in the canal and bays.

During the course of the year, the network analyzer and the differential analyzer were in substantially constant use. The differential analyzer was used in the solution of problems

not only in the field of electrical engineering, but also in the fields of Physics, Geophysics, Mathematics and Civil Engineering.

A grant from the Rockefeller Foundation made possible an investigation and development of the fundamental designs of a new differential analyzer to have greater capacity, greater accuracy and greater speed. The principal objectives of the work of the past year were the development of a new integrator, development of a system of electrical interconnections between units instead of mechanical interconnection as used in the old analyzer, and development of automatic controls. As a result of the satisfactory progress made on this program, the Rockefeller Foundation has made a further grant to enable construction of the new differential analyzer over a three-year period.

During the year we made an exchange of professors with the University of Kansas. Professor Robert W. Warner of the Electrical Engineering Department of that University spent the year at Technology and Assistant Professor Richard H. Frazier spent the year at the University of Kansas where he was acting head of the Department.

During the latter part of the year, we have had as a guest, Dr. Harry J. White of the Research Corporation, who is utilizing our laboratory facilities in an extended research on dust precipitation. This work will probably continue throughout the coming year.

We have also had a number of guests from the teaching staffs of other educational institutions who have taken advantage of the opportunity to spend some time in residence at the Institute.

The staff has shown its usual activity, both in connection with teaching and research responsibilities at the Institute and in connection with outside activities in the various engineering and scientific societies. This activity is also evidenced by a large number of technical papers which have been published during the year and by work on several textbooks, one of which came out during the year and others of which are in preparation.

The most pressing need of the Department is for space and equipment for an effective high-voltage laboratory which

will not only permit expansion of activities utilizing high-voltage electrostatic machines, but which will also include a high-voltage impulse generator.

EDWARD L. MORELAND.

Mechanical Engineering. Revision of undergraduate subjects of instruction has been continued in coöperation with other departments. It is believed that a more logical transition has been effected between first-year work in physics (mechanics) and second year work in applied mechanics. Second year students in mechanical and in aeronautical engineering receive instruction in physical chemistry and applied chemistry designed to furnish a basis for later work in strength of materials and heat engineering. The content of the electrical instruction given our students by the Electrical Engineering Department is being revised to fit more closely the needs of mechanical engineers. The Department of Mining and Metallurgy is coöperating in the development of a more fundamental study of metal processing in the Forge, Foundry and Welding Laboratories and is making available its facilities for instruction in physical metallurgy to our students of engineering metals.

The metal processing laboratories have been equipped with a sixty thousand pound testing machine, a hydraulic bend press, four laboratory microscopes, metallographic polishing equipment, and a photographic dark room with apparatus for the macro and micro examination of metals. It is intended that experiments in metal processing (casting, forging, rolling, drawing, welding, etc.) shall be followed immediately by physical examination of the product using modern technique.

The Machine Tool Laboratory instruction has eliminated duplication of machine operations with resultant saving in time which is being devoted to production problems. The condensed Machine Tool course given in the summer to aeronautical students has been found very satisfactory, and should serve as a basis for service courses for other departments. The lathe dynamometer, developed last year, has been used for a research on an aspect of metal cutting, in coöperation with the A. S. M. E. committee coördinating such work in several places.

Professor Buckingham's research on surface fatigue and wear is being continued under a grant from the Engineering Foundation. An interesting development during the year was the discovery of the beneficial influence of heat treatment on cast-iron and, as a result, a large foundry is installing furnaces and quenching tanks to treat large castings. The fatigue tests also throw light on the cause of the corrugation of rails on curved tracks.

Professor de Forest's laboratory for the study of dynamic strength of metals has increased its equipment by the addition of two high speed fatigue machines for classwork, a stress-fatigue machine for testing automotive valve springs, and an amplifier, cathode-ray oscillograph and related instruments. This laboratory coöperated with Geophysics in providing high precision springs for seismographic work in the hope of permitting simpler and more precise measurements than have heretofore been possible. The research on the notch sensitivity of steels was continued and led to the conclusion that the rate of growth of fatigue cracks was related to notch sensitivity. Lack of funds caused the postponement of the construction of a tuned vibration machine to measure the hysteresis of a steel during the progress of a fatigue test but the design is available for future development.

An interesting and perhaps important development of this laboratory is a graphite paint whose electrical resistance changes with the mechanical strain of the part to which it is applied. By means of this material, and a suitable amplifier and oscillograph, measurements were made of stress in various parts of a metal airplane propeller working under full load. It is believed that such measurements have never before been available to designers of dynamically stressed machinery.

The Refrigeration and Air Conditioning Laboratories have added a methylchloride and a Freon machine as well as a new surface cooler for air conditioning. A cold room is being used in coöperation with the Biology Department for a research on the keeping qualities of food. In further coöperation with that Department, a special course in Food Engineering is being offered to treat refrigeration machinery and apparatus for control of humidity, temperature, and airflow. Also special lectures on air conditioning were given for the Department of

Architecture's course in office practice. Professor Holt's design and installation of a ventilating system for the Main Library should be noted.

The Heat Measurements Laboratory has added photo-electric control of temperature (±.01°C) to its apparatus for the determination of the rate of heat flow through insulating materials and walls. An apparatus has also been constructed for the precise measurement of the heat flow from flat surfaces. This measurement has recently become important due to the general use of reflective type insulation. The Laboratory is coöperating with the American Society of Heating and Ventilating Engineers in a revision of the Heat Transmission Tables. The close coöperation between Professor Wilkes and others of the staff giving instruction in Heat Engineering has justified the transfer of the Heat Measurement Laboratory to this Department.

The Textile Laboratory has continued Professor Schwarz's pioneer work on the application of polarized light to textile microscopy and the technique developed here is being cordially received by the industry. Our type of equipment is now available commercially for the grading of raw cotton for maturity. The grading of wool for quality by micro methods is being attacked by E. O. Kruegel, under a Textile Foundation fellowship, and during the year his work has indicated results of great interest to the industry and to the Government. Through the Division of Industrial Coöperation, the Textile Laboratory is engaged on a two-year program of study of warp sizing for the United States Institute for Textile Research.

In addition to their regular program of research and teaching, Professors Haven and Schwarz offered a special course on six successive week-ends to twenty-two textile executives and research directors and also classes in fabric structure and textile microscopy under the State Department of Education on twenty-four evenings. The latter classes taxed to the full the laboratory space available. Further, a capacity group completed the summer session course in textile technology. Many of this latter group were teachers in schools and colleges offering textile work.

The Sloan Automotive Laboratory added to its equipment an additional dynamometer, an exhaust suction pump to per-

mit the testing of engines under conditions similar to a thirty thousand foot altitude, a Cambridge exhaust gas analyzer, and constructed a machine to give the transient response of a vibrating system to an arbitrary forcing function. Professor E. S. Taylor has developed and published the theory of his dynamic vibration absorber, now used on many radial aircraft engines.

Research work in this laboratory would be seriously curtailed for lack of funds, did not its past contributions to automotive engineering attract outside support. Research projects have been conducted during the year for the National Advisory Committee for Aeronautics, the Navy Department, and several industrial firms. Of these research projects, the most interesting to the engineering profession were: A study of the dynamics of the intake system of a Diesel engine based on acoustical principles, an investigation of the possibilities of the ported two-stroke aircraft engine, the use of controlled spark advance to improve economy, the measurement of engine friction, comparison of the indicator diagram taken with the M. I. T. indicator with the theoretical diagram computed from charts furnished by the Department of Chemical Engineering, construction of an elastic engine mount for an airplane engine, the measurement of engine vibration in such an elastic mount and the deduction of the inherent roughness or forcing function of the engine.

Mention should be made of Professor Fales' work on highway safety, involving approximately one thousand miles per week of road testing.

The work on steam tables which is being carried out by Professor Keenan in collaboration with Professor Keyes of the Department of Chemistry will be published early in the fall. During the past year a complete semi-gradic formulation of the thermodynamic properties of water at pressures and temperatures above the critical conditions has been accomplished. This is probably the first time that a dependable formulation joining the vapor and the compressed liquid regions above the critical point has been realized for any substance. At the request of several steam turbine manufacturers, the new steam table data are being prepared in the form of large scale charts as well as in the usual tabular form.

The apparatus for measuring the discharge coefficients of

metering nozzles mentioned in last year's report has been developed further. It is being used in the extensive nozzle investigations of the Fluid Meters Committee of the A.S.M.E.

This spring the Mechanical Engineering Department, together with the Engineering School of Harvard University, sponsored a series of lectures by Dr. Max Jakob, formerly in charge of the heat laboratories of the Physikalisch-Technische Reichsanstalt. He delivered a series of six lectures, three at Harvard University and three at Technology, on experimental studies of evaporation and condensation.

Mayo D. Hersey gave a special course of fifteen lectures on lubrication theory for the staff and graduate students. It is planned, from this valuable orientation in modern lubrication science, to develop more rational instruction in lubrication for our undergraduates. A beginning will be made by establishing a lubrication laboratory for the demonstration of fundamental principles and for experimental research. The present instruction in fluid mechanics will be extended to include lubrication theory and the machine design instruction will include lubrication practice.

We were again fortunate to have as special lecturer Dr. L. K. Sillcox of the New York Air Brake Company, who spoke to the seniors on the mechanics of accelerating and braking modern railway equipment.

Dr. H. Peters continued the Department's research on hydraulic cavitation commenced some years ago by Professor Spannhake. This year the work was supported by the War Department, United States Engineer Office, and the objective was to determine the relative resistance to cavitation attack of a large number of steels and bronzes that might be used for the salt water turbines of the famous Passamaquoddy Tidal Power Project. Dr. Peters succeeded in establishing, for the first time, a scale of relative resistance of each material to cavitation attack by salt and by fresh water. The publication of the results by the War Department should constitute a by-product of permanent value from this controversial enterprise.

The Photoelastic Laboratory held in June a second New England Conference on Photoelasticity. R. W. Vose has applied his interferometer strain gage to the precise determination of Poisson's Ratio for a large number of metals.

The new five year course (II-A) in Mechanical Engineering, operated in coöperation with the General Electric Company, appears to have been successfully launched. A second group of sophomores was selected for the course from a large number of applicants. They have spent the summer at prescribed tasks in the Lynn Works and return to Technology in September. The first group have spent the summer at Technology and now go to Schenectady.

Dr. Nicholas Minorsky, when a member of the staff, suggested an electro-mechanical apparatus for the solution of certain differential equations representing elastic damped vibration with a spring parameter varying with time. Such an apparatus has been successfully constructed and tested by Dr. C. W. MacGregor and Mr. C. N. Henshaw.

There is in evidence a demand from industry and from certain government services for mechanical engineers with advanced training in materials, engineering mechanics, or heat engineering. Consequently, arrangements have been made to strengthen the Department's graduate work in strength of materials, metal processing, elasticity and plasticity, mechanical vibration, hydrodynamics, and thermodynamics. Excellent courses are already available in other Departments in applied mathematics, metallurgy, and electricity.

J. C. HUNSAKER.

Meteorology. During the year advanced studies in meteorology were pursued by nine civilian students, three Weather Bureau employees, five Army officers, and two Navy officers. Four S.M. degrees were awarded in Meteorology, one of them to Father E. Vasquez, S.J., from the Jesuit Observatory at Havana.

Coöperation with the Blue Hill Observatory of Harvard University has continued with the holding of joint seminars every Monday evening, and with the improvement and testing of the radio meteorograph developed by Dr. Lange of the Observatory.

Continued coöperation with the Woods Hole Oceanographic Institution has resulted in the publication of two more completed reports, one by Professor Rossby and Mr. R. B.

Montgomery on the momentum transfer at the sea surface, and one by Professor Rossby on the dynamics of steady ocean currents. This coöperation has also made possible a full year's lecture course at the Institute dealing with theoretical and synoptic oceanography, given jointly by Professor Rossby and by Mr. C. Iselin of the Woods Hole Institution.

The stratospheric soundings inaugurated two years ago with a special grant from the Rockefeller Foundation were continued with a series in Georgia during the passage of a tropical disturbance, and a preliminary discussion of the results was given by Dr. Willett at a meteorological seminar in Kansas City, and by Professor Rossby at the Geophysical Union meetings in Edinburgh. An extended plan of investigation of tropical hurricanes has been arranged for the present hurricane season, in coöperation with the United States Weather Bureau, and utilizing the new radio meteorographs developed by Dr. Lange at the Blue Hill Observatory. Coöperation with the Weather Bureau was furthered during the year also by the presence at the Institute, on special scholarships, of three selected members of the Weather Bureau personnel, Mr. G. Grimminger, Mr. J. W. Osmun, and Mr. A. K. Showalter. Two of these men will continue their studies or special investigations here for another year. Also the former M. I. T. Aerological Station at East Boston has been taken over by the Weather Bureau and operated in coöperation with the Army.

An extended program concerned with the investigation of long range weather forecasting methods has been planned in coöperation with, and partly supported by, the Soil Conservation Service of the Department of Agriculture. A sum of two thousand dollars has been made available to the Institute for this work during the coming year.

The demand for well-trained graduate students in Meteorology continues good in several branches of the Department of Agriculture, as well as in the Forestry Service, and in the meteorological or despatching service of a number of the air lines.

C. G. A. ROSSBY.

Mining and Metallurgy. This Department, with which Course XIV, Electrochemical Engineering is administered,

includes also five divisions of the Graduate School offering degrees of S.M. and Sc.D. in Mining Engineering, Petroleum Engineering, Metallurgy, Electrochemical Engineering and Ceramics.

In the field of Mining Engineering, laboratory instruction in Ore Dressing was changed importantly this year with the addition of more work in the field of flotation, and improved experiments in crushing and screening. Plans have already been made to include next year work in the growing field of optical mineragraphy as applied to the quantitative microscopic study of mill products. There have been also important changes brought about by rearrangement of the curriculum in Mining Engineering giving more time in the fourth year to instruction in the economics and principles of mining.

In the field of Metallurgy, studies of the problem of age hardening of metals have been continued by Professor John T. Norton, and completion of the work of the silver-rich copper-silver alloys has brought out some important fundamental information about the process. An important phase of the work is a study of plastic deformation on the mechanism of age hardening. A new X-ray unit has been built for measuring small changes in interatomic distances in metals. The new design has simplified the method so that little experience is required and accurate results are obtained rapidly.

The theory of powerful electromagnets has been worked out to such a point that it seems certain that magnetic fields of from one hundred thousand to three hundred thousand gauss can be produced over considerable volumes provided adequate sources of power are available. A magnet based on these principles has been built and installed in a sub-station of the Boston Edison Company, and preliminary experiments with this apparatus are in prospect for the immediate future. These include observations on the Zeeman effect, the effect of intense fields on biological processes, and the investigation of the magnetic properties of metals and alloys, with especial reference to permanent modifications in alloys to be produced by the simultaneous application of magnetic fields and heat. Professor Bitter has prepared a course on "Ferromagnetism" for next year, and a further course is in process of preparation on the "Equilibrium of Phases" with the object of acquainting stu-

dents with the fundamental ideas which may lead to an interpretation of phase diagrams.

Professor Zavarine, in coöperation with Professor Edgerton of the Department of Electrical Engineering, has completed a slow motion picture of the behavior of quenching mediums. The moving picture film "Quenching Process" and a talk will be presented by Professor Zavarine at the Cleveland Meeting of the National Metal Congress in October. The interest in the subject is indicated by an insistent demand from this country and abroad for copies of quenching pictures, published earlier in "Metal Progress."

Important researches are proceeding under Professor Homerberg's direction in the general field of nitriding. Lieutenants Sylvester and Whiteside investigated the nitriding of special steels that would retain a high core hardness after the case-hardening treatment. This subject was suggested by the Navy Department in an endeavor to procure materials for gyro and other parts that would be more satisfactory for the purpose than the present steels.

In the Division of Ceramics, new and important pieces of equipment have been purchased or constructed by means of funds supplied mainly by industrial companies. An electric load-test furnace for refractories has proved very useful, and it has already been employed to a considerable extent. Other equipment includes a precision apparatus for measuring the permeability of refractories relative to the flow of gases. An electrically heated Globar kiln for firing pottery has been built, and a lathe has been acquired for making plaster molds and for finishing pottery.

Considerable research has been carried on during the year, notably work on the constitution of glass by Dr. Bair whose paper received very favorable reception by the American Ceramic Society. Another research was done in the field of crystalline glazes with excellent results.

During the year, five exhibition cases have been placed in the first floor corridor of Building 8 with good illumination. These cases have been used to exhibit specimens of historic and contemporary pottery and glass which are of general interest to our visitors and students. We have also continued our displays in the case in the main lobby, where we have shown various

types of pottery and glass with a change of exhibit once a month.

The department machine shop has been rearranged and is now in charge of Professor F. H. Norton. Obsolete equipment has been removed and more room provided for the student shop. We still need additional equipment and a full-time, skilled mechanic in order to maintain the efficiency of the Department.

Activities of members of the staff include visits to Oklahoma and Kansas during the current summer by Professor H. T. Mann; also presentation of a paper on the competitive relations of the three fuels — oil, gas and coal — at an open meeting of the American Institute of Mining and Metallurgical Engineers at Tulsa, Oklahoma. Professor Waterhouse has been made a member of the Executive Committee of the Board of Directors of the American Institute of Mining and Metallurgical Engineers, and has taken an active part on a number of committees on technical subjects. Dr. Waterhouse went abroad in August and attended the meetings of the Institute of Metals at Paris and Dusseldorf. Professor Hayward is chairman of the committee of the American Institute of Mining and Metallurgical Engineers charged with the preparation of a book on the reduction and refining of lead and zinc. Professor Homerberg has been active in the American Society of Metals, and has delivered a number of lectures both nearby and in the Middle West dealing with such subjects as developments in nitriding; alloy structural steels; tool steels and tool steel failures, and surface hardening of metals. He delivered lectures also at the Post Graduate School of the United States Naval Academy. Mr. Schuhmann spent several weeks at the Montana School of Mines engaged in investigations related to the art of flotation. Professor Hutchinson was active in professional work this summer in Colorado and Utah where he spent a number of weeks.

Mr. J. H. Critchett (XIV, 1909), vice-president of the Union Carbide and Carbon Research Laboratory, gave an inspiring talk to students in Metallurgy and Electrochemical Engineering.

W. SPENCER HUTCHINSON.

Naval Architecture and Marine Engineering. In the Department of Naval Architecture and Marine Engineering there has been little change from last year except that the course schedules have been revised to accord with the new requirements adopted by the Faculty.

The name of the course in Ship Operation (XIII-C) has been changed to "Marine Transportation" and is now to extend over five years, one year to be spent at sea. In making the necessary changes we have been fortunate in having the coöperation of Mr. J. W. Powell of the Corporation. The change to a five-year course has had wide publicity in the technical press both at home and abroad, and the comments thereon have been uniformly very favorable.

During the summer Professor Jack visited the *Clyde* and inspected the shipyards of Messrs. William Denny at Dumbarton and Messrs. Yarrow at Scotstoun, where there was a very interesting experimental high pressure boiler being tested which is expected to have a very marked effect on both war and merchant ship design.

The Nautical Museum as usual had a considerable number of visitors and the collection has been increased by several interesting full models which have been lent by their owners. While it would be preferable that these were permanent gifts, it is found that the loan exhibits generally remain for an indefinite period.

J. R. JACK.

SCHOOL OF SCIENCE

Biology and Public Health. The year has brought no radical change of policy with respect to undergraduate work. There has been a revision and rearrangement of the work in Zoölogy and Anatomy which is believed to follow logically the changes in the fundamental course in General Biology mentioned last year, and thus provide a better continuity of instruction in principles, and prepare the student more efficiently for the professional courses of the upper years.

In the fourth-year work in Industrial Biology the course in Refrigeration given by members of the Mechanical Engineering Staff has been developed into a broader course in Food

Engineering extending through both terms, and dealing, in addition to the principles of heat engineering and commercial applications of refrigeration, with food handling machinery, packaging and bottling equipment, conveyor systems and temperature and humidity control. Food Engineering is rapidly developing into an important field of applied science. The new course is, I believe, unique, and should prove exceedingly useful to our students in Food Technology. Its development is another illustration of the fine spirit of coöperation between departments that characterizes the Institute.

A further proof of the coöperative spirit is exhibited in the steps that have been taken to provide training in that borderland of the sciences which for lack of a better term we call Biophysics. A recent trend in experimental biology and in medicine seeks to investigate biological phenomena by studying the effects of controlled applications of energy in various forms. The exact control and measurement of energy such as the varied types of radiations has been in the field of applied physics. Obviously a knowledge of the effects on organisms demands accurate knowledge of normal biology and physiology. The trained biophysicist, if his work is to be precise and susceptible of accurate definition, must combine both disciplines. A course of study appropriate for one desiring to enter this wide field of combined borderline sciences must be unusually comprehensive, since it must include thorough work in chemistry and physics with emphasis on the delicate manipulative and experimental aspects in highly specialized branches, a knowledge of the principles of electrical engineering and a basic training in biology. The problems susceptible of investigation are highly diversified, for they include the study of controllable dosages of the various forms of energy — electrical, electromagnetic, radiant, thermal, sonic, supersonic and chemical — upon protoplasmic structures. By this means, therefore, advancement in our knowledge of enzyme action, hormones, vitamins, disease therapy and vital chemistry may be greatly facilitated. A committee representing the departments involved, under the chairmanship of Dr. Bunker, has prepared a five-year program of study and research for students wishing to pursue this exacting field, but it is not yet proposed to offer it as a definite option in any of the departments concerned.

The Department has participated in carrying out the provisions of the Federal Social Security Act which provides for training in Public Health for suitably prepared men nominated by the various state departments of Public Health. During early March fifteen physicians and sanitarians from five states (Maine, New Hampshire, Massachusetts, Rhode Island and Pennsylvania) entered on a four months course of special training, and completed their program on July 2. Although varying in the extent of their preparation, this group worked with earnestness and intelligence and the results were highly satisfactory. Instruction was given in bacteriology, municipal and general sanitation, public health administration, industrial hygiene and public health laboratory methods, vital statistics and elements of epidemiology. Although considerable added teaching load was imposed, the work was carried out by the staff in a splendid spirit of coöperation. Professor Horwood accepted large responsibility in this work and merits thanks for his unflagging zeal in its prosecution.

The Department wishes to acknowledge with gratitude the splendid service of the special lecturers who conducted courses during the absence of Professor Turner, viz: Dr. P. G. Stiles, late Professor of Physiology at the Harvard Medical School; Dr. C. F. Wilinsky, Deputy Commissioner of Health of Boston; and Mr. C. F. Horan, Director of Industrial Hygiene for the Hood Rubber Company and other industries. They brought to their work not only high professional reputation and attainment, but a deep interest and a most helpful spirit in the work of the Department as a whole. It is with great regret that we record the recent death of Dr. Stiles, a graduate and former instructor in the Department, and a constant friend in its development.

During the past year Professor Turner has made a world tour as Chairman of the Health Section of the World Federation of Education Associations bringing together a network of directors of health education and school hygiene. He gave lectures on health education by special appointment at Calcutta University, the University of the Philippines, the Central University of Nanking and the Imperial University of Tokyo. Over sixty additional lectures were given in twenty-three other cities. In China he was engaged by the Ministry of Education

and the Ministry of Health jointly to make a study of health education activities in the interior of the country. Health films made under his direction by Eastman Kodak Company, and carrying titles indicating that they were made in coöperation with this Department, were found in use in over a dozen countries. Titles in French, Spanish, Chinese, Japanese and other languages have been inserted to adapt these films to local use. Professor Turner's book on "Principles of Health Education" is now translated into both Chinese and Japanese, and is widely used in these two countries.

As the official delegate from the Institute Professor Proctor attended the Seventh International Congress of Refrigeration at The Hague, Holland, in June, and presented a paper with Dean S. C. Prescott as co-author, entitled "Progress in the Application of Refrigeration to Public Health." He also read a paper by Professor Prescott and L. P. Geer, a former Research Associate, on "Observations on Food Poisoning Organisms at Low Temperatures."

In August Dr. Proctor attended the Second International Congress for Microbiology in London and presented a paper on "The Microbiology of the Upper Air" concerning findings made as a result of research at M. I. T. in the past several years. Visits were also made to numerous universities, biological, health and industrial laboratories and food manufacturing plants in Switzerland, Germany, France and England to study foreign methods of teaching, research and food manufacture. Professor Proctor continues to serve as the Chairman of the Committee on Foods of the American Public Health Association.

The graduate instruction continues to develop in scope and importance, several new courses having been established during the year, notably a course in Advanced Physiology by Dr. Sizer and Advanced Biochemistry by Professor Bunker and Dr. Gould.

With Professor Turner's return from his leave of absence, the graduate courses in Health Education, which were not given during the past year, will be resumed, and the prospect is that a fine group of advanced students will be in attendance.

The Department has been active in research during the year, both in pure science and in industrial applications. This has been in part possible through the grant from The Rocke-

feller Foundation now terminated, and by grants from the American Can Company, New York, the Upjohn Company of Kalamazoo, Michigan, the Anour Company of Cincinnati, the Ayer Company of Lowell and the American Ice Company of New York.

The extended researches on the chemistry of coffee financed by the American Can Company, and continued during the past three years, terminated in the spring and the report thereon has been made. A series of papers is now being prepared for publication.

The Rockefeller Foundation has generously made an additional grant for further biological research during the current year. A grant from the National Research Council for further study of the problems pertaining to the relation between rickets prevention and light of different wave lengths has been provided. The study in this field by Professor Bunker and Dr. Harris has been widely accepted as of prime importance.

The researches entirely supported by departmental funds grow in importance yearly, and are hampered only by lack of resources and space limitations. Every effort should be made to remedy this situation at the earliest moment.

Professor Horwood has made an important contribution to the methods of sanitary examination of water.

Professor Williams has extended his researches on pathogenic fungi. Professor Blake in addition to his other researches has made a comprehensive study of termite distribution and damage. Professor Jennison has continued his work in Air Examination.

Professors Prescott and Proctor have completed the manuscript for a comprehensive book on Food Technology which is now in press.

Members of the Department have been of public service in various ways. Professor Prescott is one of the three editors of a new journal, *Food Research*, now in its first year, which has already made an excellent impression and is gaining a wide clientele. He is also serving as one of the vice-presidents of the American Public Health Association, and on the Advisory Board of the Boston Department of Health, as well as Chairman of the Committee on Sanitation on the Commission on Revision of Laws and Policies of the State Department of

Health. Dr. Horwood also gave much assistance as Chairman of the Sub-Committee on Housing, and as a member of the Sub-Committee on Water and Sewage. In the emergency created by the flood conditions in March Dr. Jennison and Dr. Dunn rendered service to the State in the examination of a large number of the public water supplies. Professor Bunker has continued to carry on the work of evaluation of vitamin content in irradiated milks for the Medical Milk Commissions. Professor Williams has served as Associate Chief Examiner of the Boston Subsidiary Board of the National Board of Medical Examiners.

S. C. PRESCOTT.

Chemistry. The most significant item for the year is undoubtedly the operation and accomplishment of the Committee on Undergraduate Instruction of which the Undergraduate Administration Officer, Professor Hamilton, is Chairman. The Department Chairman and representatives of the first year, organic, and physical chemistry divisions serve as committee members.

The weekly meetings of the committee began over a year ago, and have continued without interruption. It is evident that the purposes for which the committee was formed are being well served, for general departmental meetings are much less effective than a committee of staff representatives, each of whom brings before the committee the conclusions reached in discussions within his own group.

The Department is fortunate in having the means of supplementing the committee plan through monthly semi-social meetings of the entire staff in the Forris Jewett Moore Room. Better mutual understanding of all phases of the Department's activities has been greatly promoted and staff loyalty and coöperative productivity have never been more evident.

The committee has been operating long enough to venture a brief statement concerning some of the subjects given consideration and the changes in procedure brought about thereby. The comprehensive examination, a device which has been explored for a number of years in an attempt to test its effectiveness as a means of leading students of chemistry to correlate knowledge and deepen scholarship, has been discontinued.

Success has not been impressive, due, it is believed, to mental habits and points of view with regard to the purposes and the aims of intellectual effort acquired by the student in the course of his earlier school experience. After a painstaking attempt by the Chemical Engineering and Chemistry groups to appraise the facts accumulated over a period of years, the conclusion is that the objects sought through the operation of the comprehensive examination cannot be realized as easily as this superficially alluring device promises. It is now proposed, in brief, to plan and to interrelate the material of the chemistry subjects in a manner to virtually compel the student to correlate knowledge acquired and to use it as the basis of acquiring new knowledge; the latter being the most durable benefit obtainable in the educational experience.

The committee began this task of coördination by requesting topical outlines of all subjects. A review of the outlines suggested queries and prompted suggestions by all members of the staff resulting in the interrelation of the material of the subjects on the basis of the information acquired. As this effort proceeds, decisions will be reached touching on the most effective distribution of the material with the expectation of welding it into an organic whole. Not the least important benefit growing out of the effort is the information coming to each staff member of the content of his colleagues' subjects, with attendant enhanced interest in the coöperative action necessary to make the coördinating plan wholly successful.

The considerations referred to prompted immediate changes in the arrangement of the work in physical chemistry. The Institute has always been distinguished for the thorough and comprehensive quality of its undergraduate and graduate instruction in physical chemistry due to the efforts of the late Professor A. A. Noyes and Professor Miles S. Sherrill over a period of more than thirty years. During this time the number of engineering students taking physical chemistry has increased steadily. The time made available for this study and the purposes the subject served made it undesirable to place these students in the comprehensive introductory course. The usual procedure of devising special courses has been practiced, but a unification and some consolidation is now desirable. There is in the future to be a single introductory but thorough third-year

subject* given to all students. The time devoted to this will be sufficient to make it a logical whole. Students of chemistry are required to continue the subject throughout the fourth year. The two-year subject is designed as a single unit and a continuing effort is to be expended in closely relating its content as much as possible to the varied phases of chemical and physicochemical phenomena. This connects logically with the graduate subjects since the aim is to mould the work in chemistry into a continuous sequence from the freshman to the final graduate year.

The system of appointments for full, half-time, and hourly assistants has also been critically considered. The merits and defects of the system touch closely our graduate school practices. Omitting details, the entire system has been abolished and a new scheme of Teaching Fellowships adopted. For the academic year 1936–37, twenty-four fellowships have been authorized, and all appointees will be candidates for the Ph.D. degree.

The applicants for the positions are to be employed exclusively for undergraduate laboratory instruction. Applicants are appointed without consideration to the branch of chemistry they will follow as graduate students. The committee endeavors, however, to select only those who combine the prospect of fulfilling their assignments satisfactorily and attaining superior levels as prospective scientific men.

The Teaching Fellow is allowed the privilege of applying to the Committee on the Graduate School for a grant of funds to provide for tuition. In addition, and because of the high quality of the Fellows, they may be recommended by the department to the Loan Board† for financial aid. A second appointment will be made in those cases where service and achievement in graduate work have been outstanding. No appointment will be renewed for the last year of graduate study, but financial assistance may be obtained from the Loan Board and the Graduate Committee for normal requirements.

The Teaching Fellow is expected to continue his research

* The special subject given for biology students is being continued for reasons related to the requirements of the specialized branch of biological physical chemistry which is rapidly developing.

† A recent change by the Loan Board of its rules and regulations gives Teaching Fellows the opportunity to borrow sums in excess of the scholarship awards for tuition.

during the months of June and July of each summer, thereby compensating for the time devoted to laboratory assistance during the academic year. The plan enables the really outstanding student to finance himself practically completely and still not suffer the slightest handicap in graduate study. The expectations are that better service will be secured and a larger proportion of outstanding graduate students accepted. These objectives are important, for the accomplishment of the most competent staff is sterile without promising students to inspire.

The undergraduate now begins to consider the thesis problem in the third year and this change is in line with our hope of improving the value of the thesis as a means of promoting intellectual maturity. A beginning has also been made in revising specified requirements for graduate students in the direction of placing greater emphasis on accomplishment in research and less on the successful passing of subjects. The wisdom of the administration's change in policy that allows graduate students and seniors to conduct research throughout the summer has been demonstrated through the stimulated interest of students.

This spring a complete schedule of the entire teaching staff was compiled, attended with a redistribution of teaching load. One of the purposes of this effort is to provide the time for every staff member to participate in research and those other activities for the pursuit of which he possesses special ability.

Earlier reports convey some impression of the rise and ebb of hopes with respect to acquiring facilities for low temperature research. The successful production of liquid hydrogen in quantity without the usual expensive equipment by a novel procedure developed during the past year practically guarantees success in producing liquid helium, by means of which the lowest temperatures become attainable. In this development a new technique has been evolved wherein glass apparatus has been eliminated in low temperature manipulation thereby not only extending the scope of low temperature experimentation but reducing the refrigeration costs. The unquenchable enthusiasm and tireless efforts of Doctors Harold T. Gerry and John F. G. Hicks have made the venture successful.

A fundamental requirement in the production of liquid hydrogen and liquid helium is an adequate supply of liquid

nitrogen. Various plans to meet the situation have been discussed with the Departmental Visiting Committee, resulting finally in a decision to postpone further consideration of the project of erecting a liquid nitrogen plant on Institute property. Through the immediate efforts of Mr. J. A. Rafferty, President, Doctor G. O. Curme, Vice-President, Mr. J. J. Murphy and Doctor L. I. Dana, the Linde Air Products Company has added the apparatus to its South Boston plant which will permit the withdrawal of liquid nitrogen for use in our cryogenic research. Without this generous assistance the prospect of realizing on the Department's research plans would be indeed bleak. The most enduring form of appreciation for the services rendered by our friends will consist of the excellent training in low temperature research technique given to our graduate students and the value of the actual research accomplished. With reasonable support, steady expansion of low temperature research should result in the establishment of an outstanding center for cryogenic research at M. I. T.

The demand on the part of industry for chemists, particularly those with graduate experience, continues to far exceed the supply. Indeed, positions have been accepted by students whose requirements will not be completed before the spring of 1937.

A. H. Gill, Professor Emeritus, has continued his active interest in the Department and through his efforts a number of fine photographs of former members of the Department have been acquired.

FREDERICK G. KEYES.

General Science and General Engineering. The choice of electives in Course IX depends upon the purpose for which the course is selected. At present the registrants are divided into two distinct classes.

In the first class are those students who wish to complete a course agreeing literally with the title. In this class electives are chosen which extend the understanding and application of all the engineering sciences, including economics, social science and business. The schedule of electives is approved only when it exhibits a proper sense of balance.

The second class contains those students who wish to com-

plete a course with an unusual purpose. The schedule often represents a pioneer curriculum which may develop into a standard course. The choice of electives is governed completely by a definite adherence to the particular objective. In this connection it is frequently desirable to substitute a pertinent subject for an irrelevant item of the general schedule.

At present most of the students registered in Course IX belong to the second class. In many instances a student is preparing for a definite position and has received considerable guidance from the officers of the company in which he is to be located. In such cases the selection of electives or the desirability of substitutions often originates in or is confirmed by the industry.

R. G. HUDSON.

Geology. A general revision of Course XII made a year ago and in operation during the past year has proved most satisfactory. There have been no essential changes in educational matters within the Department during the year.

Aided by the Rockefeller Fund and grants from other sources, the research work of the Department has gone forward with gratifying 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. Eight volumes have now appeared to which other members of the staff made substantial contributions.

Professor Shimer has been corresponding with several hundred paleontologists for suggestions pertaining to the revision of Grabau & Shimer's "Index Fossils of North America."

Professor Morris made a final report on the Jurassic formation of Central Asia and continued his petrographic and structural studies of rocks of eastern Massachusetts and made a study of the beaches of eastern Florida with a view to the problem of protecting them against erosion.

Professor Slichter continued research on certain exploration problems connected with the crust of the earth and the earth's interior. In general these problems are of such a type that results or methods have significance both in the field of

geophysical prospecting and in pure geophysics. A low cost, yet highly sensitive three component seismograph with camera has been constructed, and is being tested. This is one of a group of twelve which are being constructed with funds supplied in part by the Geological Society of America. In connection with this research program three important geophysical papers by J. A. Sharpe, N. A. Haskell and C. L. Pekeris have appeared during the past year. There is a continued and increasing demand from commercial organizations for men trained in applied geophysics. At least eight men were supplied to such positions by the Institute during the year of which only three have had special geological training. It is hoped that more students will be attracted by opportunities in this field of work where the demand now exceeds the supply of trained men.

Professor Newhouse, as Chairman of the National Research Committee on Processes of Ore Deposition, has initiated a symposium on the Influence of Structural Features on Ore Deposition. Approximately one hundred geologists from mining camps in all parts of the world have agreed to contribute. The results should have both theoretical and practical importance.

Professor Buerger has applied the new equi-inclination method developed in his laboratory to the unique determination of the crystallographic constants of several crystals whose natures have prevented correct crystallographic analysis by the customary methods. These include berthierite ($FeSb_2S_4$), nitrogen sulfide (N_4S_4), gudmundite (FeSbS), arsenopyrite (FeAsS), and manganite (Mn(OH)O). A new method for the treatment of the crystal structures of superstructure crystals has also been developed. This has permitted the complete determination of the crystal structures of arsenopyrite and manganite which has led to a complete revision and reclassification of the crystals based upon a marcasitelike packing. A new apparatus is being constructed for the precision determination of the lattice constants of single crystals (both lengths and angles), a field in which precision has never been attained.

Professor Buerger and Mr. Bloom have continued development of a general theory of the mechanism of the generation of polymorphous forms, which has received substantiation from their work on the control of the polymorphism of Sb_2O_3 by

variation of its precipitation environment. The theory shows promise of explaining a wide range of phenomena which have previously appeared anomalous.

WARREN J. MEAD.

Mathematics. A considerable proportion of our students in mathematics are interested in work of an actuarial or statistical nature. To provide a better preparation for such work Dr. Wadsworth has developed a course in the mathematical theory of statistics which he will offer next year.

During the year Dr. Crout has had charge of the course in mechanics, and next year he will also be responsible for that in the theory of elasticity. About these subjects as a nucleus it is expected to develop the work of Course XVIII in applied mathematics.

Under the leadership of Professors Struick and Hopf a seminar of slightly more elementary character than usual was conducted in which graduate students reported on topics of intermediate mathematical difficulty, giving considerable attention to form of presentation.

For his work on the problem of Plateau, Professor Jesse Douglas was awarded a Fields gold medal at the International Congress of Mathematicians which met in Oslo. Two of these medals were awarded for the best mathematical work done during the preceding four years. Professor Douglas has also been invited to deliver the colloquium lectures of the American Mathematical Society at its summer meeting in 1937.

Professor Wiener spent the year as Research Professor of Mathematics at the National Tsing Hua University, Peiping, China. On his way home he attended the Oslo Congress, at which he gave one of the invited addresses.

Professor Franklin spent the year in research at the Institute for Advanced Study, Princeton.

H. B. PHILLIPS.

Physics. The most important development of the year in the Department has been the growing recognition of the significance of applied physics. There has been a tendency in the past among physicists to take interest only in the direct line of development of their science, and to neglect its applications.

This has led to extraordinary developments of physics in recent years and many of these, such as the use of thermionic devices, have proved to have industrial applications of the greatest commercial value. A great deal of engineering, in fact, is really the development of applied physics, and it is obvious that engineers, not physicists, should carry out such work. But in the early stages of an application of physics, before it has reached the stage of engineering, the physicist is needed, one who knows the present lines of development of the science and who has the imagination to foresee the practical applications which can come from them. To develop such physicists, trained in classical and modern physics, and at the same time in other sciences and in engineering methods, is to the advantage both of industry and of our graduates. A need for men of such training is already felt in industry, and it is being further encouraged by active efforts of the American Institute of Physics, which is well aware of the situation. The Department has many more calls for men of such training than it can fill, and it is plainly a duty to our students to direct them into an expanding and uncrowded field of this sort.

With these thoughts in mind, and after a thorough discussion of the problem by the Visiting Committee a year ago, the Department has taken several definite steps toward the strengthening of applied physics. Last year I reported that a Doctor's degree in applied physics was being planned. No candidates have yet taken this degree, but a number of students are working for it, and many are now entering the graduate school with it in mind. During the year Professor Harrison has been actively engaged in developing interest in applied physics, and he has been appointed Director of Applied Physics. His activities have extended outside the Institute to a number of valuable conferences on the importance of physics to industry and agriculture. The Department, after long consideration, has decided that emphasis on applied physics should be brought into the undergraduate as well as the graduate work, and has established an Option 2 of Course VIII, in Applied Physics. This option includes more chemistry than Option 1, some metallurgy, but a little less mathematics, and leaves less elective time. Option 1 at the same time has been revised, both options now including a full year of electrical engineering, and a new

senior laboratory in experimental physics. It is believed that by these changes the undergraduate work of Course VIII will be materially strengthened.

While more attention is being given to applied physics, there has been no lessening of the efforts devoted to pure physics. The research program of the Department, largely in pure physics, is progressing with great activity. Professor Harrison has carried forward his spectroscopic program of remeasuring the spectra of the elements with improved accuracy, using his automatic wave length measuring machine, and employing WPA workers. Professor Van de Graaff has completed the high voltage generator at Round Hill, obtaining a direct current of over a milliampere at five million volts, easily controlled and measured, and forming the most powerful high voltage source of direct current so far produced. He is rapidly finishing the discharge tube for the acceleration of atomic particles for nuclear research. Professor Warren has continued his research in the field of X-ray determination of the structure of glasses, amorphous solids, and liquids, obtaining results of great scientific importance and of wide commercial value. The group engaged in electronics, including Professor Nottingham, Dr. Lamar, and others, has made significant progress in thermionics, and in the study of gas discharges. Professor Hardy continues to make valuable use of the Color Analyzer, and is constructing a revised instrument. He has completed during the year a Handbook of Colorimetry, published by the Technology Press, which should be a standard work in its field. Professor Mueller has continued his study of the theory of dielectric properties of crystals, and Professor Stockbarger has improved his technique for making crystals. Professor Evans is rapidly developing his laboratory of nuclear research and is collaborating with other departments in the study of the age of the earth, biophysical problems, and radiochemical problems. The group in theoretical physics has continued work in a wide range of problems: classical physics, including acoustics, vibrations, and electromagnetic theory; the theory of metals; the theory of electric arcs; and many others. Two members of the Department have been absent during the year, engaged in research: Professor Vallarta spent the year in Belgium, as fellow of the C.R.B. Fellowship Board, lecturing in

various Belgian universities, and collaborating with Professor Le Maitre of Louvain on the problem of the trajectories of cosmic rays. Professor Boyce has been in England for the second half year, later going to Russia to observe the eclipse of the sun in connection with the joint expedition of Harvard University and of the Institute, an expedition which obtained excellent photographs of high astrophysical and spectroscopic importance.

The Department has been increasingly active in arranging conferences for various groups of visitors. The spectroscopy conference was enlarged this summer to form a conference of Spectroscopy and Color Measurements, under the joint direction of Professors Harrison and Hardy, and attracting a large group of industrial and academic workers. A smaller but valuable conference of industrial research men interested in electronics was held during the spring by Professor Nottingham and the electronics group.

In the other fields of the Department's activity there has been steady progress, though there are no specific events to record. In particular, the freshman and sophomore physics courses continue to be the subject of much continuous effort on the part of practically the whole Department, and it is believed that they become continually better adapted to the needs of the undergraduates and of the other departments of the Institute.

JOHN C. SLATER.

SCHOOL OF ARCHITECTURE

Architecture. No single event during the year has aroused more interest, both within and without the School, than the new undertaking, announced in last year's report, of having first- and second-year students design and supervise the construction of a small house. Originating with Professor Gardner, the idea has been carried out under the direction of Professor Bridge, assisted by Mr. Dean and Mr. Fitzpatrick. From the outset the students showed the keenest interest. The increasing zest, with which each fresh stage was welcomed, bore witness to their eagerness as well as to the quality of the teaching. A lot was selected and surveyed by the students; a house

was designed and contracts have been let for its construction which will be supervised by the students during the fall term. It would be difficult to find a more practical method of becoming acquainted with the realities of architecture while studying the principles of design.

Another outstanding event of the year was the study of our curriculum, both objectively and relatively, by a Faculty committee of which Professor H. H. W. Keith was Chairman. The report submitted by this committee, and later approved by the Faculty, recognized the general soundness of our methods, but recommended an increase in the time devoted to the study of science, and the introduction of a course in Building Materials including laboratory tests of their characteristics. In the adjustment of our curriculum to comply with these recommendations, provision will be made at the same time for an elective in our fifth year, as suggested in last year's report.

In connection with these changes it is of interest to note that as a result of the success of last year's course in Industrial Design, offered under General Studies, more time will be given to this subject during the coming year with a view to offering a more advanced course at a later date. Mention should also be made of the extracurriculum advantages made available to our students through the enterprise and devotion of Mr. Samuel Chamberlain in placing etching and lithographic press facilities at their disposal in the basement of Rogers where they may also benefit from seeing him execute some of his own plates.

A change in the teaching policy at the Harvard School of Architecture has resulted in the elimination of the conjunctive problems among Harvard, Technology, and the Boston Architectural Club that have characterized design work in our fourth and fifth years for nearly twenty years. An excellent alternative was found in an interscholastic problem shared with the Schools at Armour Institute, Cornell and the University of Minnesota which will be repeated this year. The exchange of professors with the latter institution, as a result of which Professor Roy Childs Jones came to Technology and Professor Anderson went to Minnesota, was a success from every standpoint, giving us the benefit of Professor Jones' fresh judgment and Professor Anderson the advantage of a wider experience.

Continued attention is being given in our teaching to the

better coördination of Freehand Drawing, Construction, Color, Modelling, and History with Design. Teachers of these different subjects are constantly present in our design juries and aid in the draughting room criticism of design problems. A study is also being made of how the successive years of design may be more effectively related to one another both in the sequence and nature of problems and in teaching methods.

There is a growing interest, both among our own students and also those coming to us from other schools, in the development of a course in Architectural Administration to which reference has been made in previous reports. There is furthermore need, in recognition of the quality and distinctive nature of the work in City Planning, for the establishment of a travelling scholarship for graduate students in this course.

The year has brought valued evidence of interest in the School through gifts of architectural books from Mrs. Charles G. Weld of Brookline and Mr. W. Power Blodget of Boston. Our library is becoming increasingly useful to the students and is further much referred to by architects and scholars.

Our students have been successful during the year in winning both the Boston Society of Architects Prize, competed for annually by students of Harvard, Technology, and the Club, and the Rotch Traveling Scholarship.

It is a pleasure to express the School's gratitude to the members of the Visiting and Advisory Committees, to those architects who give their time so generously on its juries, and to the administrative officers and teachers in Cambridge for the many ways in which their official and friendly interest has been expressed.

WILLIAM EMERSON.

City Planning. The most important change in the city planning curriculum during 1935–36 was the introduction of graduate courses in design, research, legislation, and administration. A course in Planning and Housing Legislation was given during the first term by Professor Edwin S. Burdell, of the Department of Economics and Social Science, and in City Planning Administration in the second term by Professor Joseph T. Woodruff.

Research studies were carried on by the three winners of

the graduate research scholarships, under the supervision of the instructing staff. Mr. John T. Howard presented reports on "The Relation of Zoning to Methods of Land Assessment," "The Relation Between Land Use Changes and Land Value Changes in the City of Springfield, Mass.," and "A Plan for Freight Transportation for the Port of Boston." Planning studies were made for the Brighton area of Boston by Mr. Howard; for Cuyahoga County, Ohio, by Mr. Carl L. Feiss; and for Saugus, Mass., and part of the City of Lynn, by Mr. Thomas L. Mackesey. The fifth-year class collaborated on a Regional Plan for the Neponset River Valley.

An important addition to the undergraduate course was the inclusion of a course in Landscape Construction, which has since been renamed Site Planning and Construction Details. This course was given jointly by Ralph Eberlin, consulting engineer to the Resettlement Administration and the City Housing Corporation, and Marjorie S. Cautley, landscape architect for Radburn, N. J., and the Hillside Housing Corporation. Engineering and architectural site plans and construction details were prepared for a group of sixty houses, and detailed cost estimates made of the completed work.

During the year the following experts in city and regional planning lectured to the city planning class: Thomas Adams, Gilmore D. Clarke, Jay Downer, Howard Whipple Green, Miss Elisabeth M. Herlihy, William Roger Greeley, Albert Mayer, Walter R. MacCornack, John Nolen, Warren Jay Vinton, and the late Henry Wright.

At the end of the second term two scholarship awards were made to students in Course IV-B, John T. Howard receiving the Traveling Fellowship for a year's study and travel abroad, and Louis B. Wetmore winning a scholarship for graduate study under Eliel Saarinen at Cranbrook School, Bloomfield Hills, Mich.

How long the governmental program in state and regional planning will last is open to conjecture, but it would seem now to be established on such a firm foundation that it is unlikely to be seriously affected by political fluctuations. Graduates of the city planning course are beginning to take their place in this activity, and have found employment on the staffs of the following governmental agencies: The New England Regional

Planning Commission, the Massachusetts State Planning Board, the New York Department of State Planning, the National Parks Service, and the Suburban Resettlement Division of the Resettlement Administration. Three former students have been appointed to instructorships in the schools of architecture at the Institute, Columbia University, and Pennsylvania State College.

The first award of the newly-created degree of Master in City Planning was made to Mr. J. Ross McKeever in June, 1936, and three more students will be eligible for this degree on the completion of their thesis. With the closing of the School of City Planning at Harvard University, Technology becomes the only institution in this country offering a Master's degree in city planning, and upon it devolves the responsibility of leadership in the important and everbroadening field of Planning Education.

WILLIAM EMERSON.

Architectural Engineering. Although the consideration of the content of Course IV-A was not a part of the charge of the committee which was appointed a year ago last May to make a survey of Courses IV and IV-B, the committee, in order to arrive at an intelligent decision, found itself obliged to make a careful study of the relations existing among all three courses offered by the School of Architecture.

For the purposes of such a study, Course IV-B which follows Course IV in all details during the first three years and diverges into its special field only in the last two years of its curriculum, may be considered as an option in Course IV. In the deliberations of the committee it became quite evident that Course IV-A may be classed as complementary to the other two. Course IV-A furnishes the engineering element in architecture which is minimized in Courses IV and IV-B, while both the latter courses furnish the element of design in architecture which is minimized in IV-A.

Both these elements must be associated before all the detailed drawings and specifications for an important building can be completed. Thus neither IV with its option IV-B, nor IV-A should be considered as entirely complete in itself. They should be considered rather as two closely related units of a

single whole, and only through the combination of their specialized fields can an architectural design be consummated.

This is the same view that was taken when the Course in Architectural Engineering was established, the one along which it has developed and the one which furnishes the reason for an approach to Structural Engineering through Architecture.

W. H. LAWRENCE.

Drawing. The policy of the Division in teaching Engineering Drawing and Descriptive Geometry has become definitely established during the recent years and continues with only such minor modifications as promise more effective use of the time at our disposal.

We must record with sorrow the death of Associate Professor Harry C. Bradley which took place last March. Professor Bradley has been connected with the Division since 1897 and has rendered most valuable and efficient service.

The Division has given much thought during the year to the possible usefulness of the motion picture in connection with the teaching of descriptive geometry. A film has already been completed for use in connection with the teaching of engineering drawing the usefulness of which is not questioned. It serves to bring before a large class the various processes of machine tool work in a way that can be clearly understood by every one. Drilling, reaming, counter-sinking, screw thread cutting and similar processes which the student must specify on his drawings can be photographically reproduced in the motion picture. These processes once seen are not easily forgotten. The film enables the student to understand what the specifications on his drawings mean and to use them intelligently. Were it not for the motion picture this information could only be imparted by taking the students in comparatively small groups to the machine tool laboratory at a very considerable expense of time and trouble. The usefulness of the motion picture in the teaching of descriptive geometry is not nearly so clear, and it is not yet felt that the rather considerable expense which would be involved in the production of the film would be warranted.

W. H. LAWRENCE.

DIVISION OF HUMANITIES

Economics and Social Science. Changes in staff and in the various course curricula have necessitated certain modifications in the subjects offered by this Department. The revision of the general studies has required the omission of two Economics subjects formerly offered. These have been replaced by the extension of our offerings in psychology and sociology. We plan to add to this list in the future in order to encourage those students who desire to do so to make their choice of general studies from the field of Social Science.

Changes have been made in the statistical subjects offered; the old subjects have been reorganized and a new one, "Statistical Methods for Quality Control," has been introduced. It seems proper that the quantitative aspects of social studies should be given a special emphasis.

During the year the members of the staff of the Department have been engaged in various outside activities. Professor Burdell represented the Institute at the National Housing Conference in October and amongst other public service activities served on the Board of Prison Industries. He was also appointed as Special Technical Consultant to the State Planning Board of Massachusetts in charge of inaugurating a series of studies of zoning and planning administration in the cities and towns of this state. During the summer Mr. Livernash was engaged in a survey of the labor market in the State of Colorado under the Social Security Committee of the Social Science Research Council. Mr. H. A. Freeman has prepared statistical analyses for several industrial concerns. Mr. Fairley has made a study of emergency relief in New Jersey under the Works Progress Administration.

Professors Armstrong and Tucker have been active during the year as speakers at schools, clubs and other organizations, and all the members of the Department have contributed to the monthly reviews being published by *Mechanical Engineering*.

RALPH E. FREEMAN.

English and History. During the year a departmental committee on curriculum made a careful study of all subjects offered by the Department. For the required work of

the first two years it set up an improved sequence of subject-matter in the fields of literature and history, with the double purpose of giving each student some range of choice and of insuring that each subject he takes shall provide a broad and substantial foundation for whatever subjects he may elect in these fields in his junior and senior years. For these elective subjects, known as General Studies, the committee provided a more systematic arrangement, so that a student who so wishes can pursue in succession special topics in a chosen field — literature, history, or the fine arts. Throughout the period of its work the departmental committee was in frequent consultation with the Faculty committee on the Humanities, and the conclusions reached are a gratifying demonstration of the value of coöperation.

HENRY G. PEARSON.

Military Science and Tactics. In general the work of the Department has proceeded smoothly along usual lines. The Engineer Unit revised its schedule 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, 1936–37. This change was desired in order to maintain contact with the students during the second year of the Advanced Course.

The adoption of the two-hour drill period during the past year for the freshmen, in place of two one-hour periods, proved to be impracticable, and it has been decided to return to our former drill schedule.

Interest in marksmanship continues to increase. A faculty pistol team was organized last fall and is being coached by members of this Department. Approximately 150,000 rounds of caliber .22 ammunition were fired on the small-bore range by the Varsity, R.O.T.C. and the Freshman Rifle Teams, and by the Pistol Team. In Intercollegiate, National Rifle Association, and other matches, the teams had a most successful year, but were greatly handicapped by the small range, which was in almost continuous use during the season.

The R.O.T.C. Team won the championship of the First Corps Area and was presented with the Hearst Trophy and each individual team member was presented with a gold medal.

S. C. VESTAL.

Modern Languages. The modifications in the Modern Language entrance requirements recently approved by the Faculty may have some effects on the work of the Department rather difficult to anticipate, but it is hoped that any changes will be moderate, affecting the quantity of the work and not the quality. In the new arrangement German suffers far less than French, and it seems unfortunate that the whole experiment tends to lessen very appreciably the place of French culture in our scientific curricula.

A considerable part of the staff's time was devoted to the eighty-four individual language examinations of graduate students. In a number of cases private help was freely given in preparation for these tests, and this year it is planned to offer special courses without credit open to all graduates needing a review who may wish to take advantage of them. It is gratifying to report how seriously these examinations are regarded and how well the present system is working.

In the General Studies there was a marked increase in the number of students. On the other hand, owing to the new methods of admission and to the increasing number of other institutions offering summer courses for much lower fees, our summer language classes have steadily become smaller. Foreign scholarships were secured for some students, but the demand for them was less than last year. A series of German dramatic readings by the actor Paul Dietz was offered free to students and faculty. A prize for excellence in German, consisting of a six-volume edition of Goethe's works, offered by the Carl Schurz Memorial Foundation, was awarded to Mr. F. B. Wood, (Course XVI, Graduate). The usual tickets to local foreign language films were distributed to a large number. Many important books, especially in French and Spanish, were added to the Library. At the College Entrance Examination Board the Institute was represented by Mr. Koch as reader in French.

At the annual meeting of the Visiting Committee with the staff the main point discussed, proposed by one of the Committee, was the old one of the desirability of placing greater emphasis on the oral use of the languages taught. The Department felt that the existing methods at the Institute gave as large a place as possible to this side of language teaching in most of the courses, in view of the limited time at their dis-

posal, but agreed that in the case of Spanish some further experimentation might be made. With this in view considerable time has been given during the past year to the oral discussion of important articles in a Spanish newspaper, and the results have been excellent.

The phonograph room has recently been very successfully insulated, resulting in much clearer audition of the records and an elimination of all disturbance to neighboring classrooms. A new high-grade radio-phonograph and a fine set of French dramatic records have been added. In every way, therefore, the facilities for individual oral practice have been approved. We may add that this service of the Department is at the disposal of any member of the Faculty planning to go abroad and has already been utilized to advantage in a number of cases.

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 30, 1936, 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:

Contributions to Class of 1909 Scholarship Fund	$1,050.00
Emma R. Culver Estate for Llora Culver Krueger Fund	5,573.75
Coleman duPont Estate, for Endowment (additional)	49,966.45
Arthur F. Estabrook Estate, for Endowment (additional)	3,200.00
Henry C. Frick Estate, for Endowment (additional)	2,322.48
Mary Granger Estate, for Eliot Granger Fund	20,000.00
George Wyman Hamilton Estate, for Endowment	54,454.15
Abby W. Hunt Estate, for Endowment	72,000.00
Rebecca R. Joslin Estate, for Scholarship Fund (additional)	5,000.00
C. Lillian Moore Estate, for Grimmons Fund (additional)	1,940.30
Harriette A. Nevins Estate, for George Blackburn Fund (additional)	965.76
Oscar L. Patch Estate, for W. B. Rogers Fund	1,075.00
W. G. Peters, for Chandler Fund	200.00
C. O. Prescott Estate, for Endowment	30,640.78
Frances E. Roper Estate, for Endowment	2,000.00
Contributions to Sailing Pavilion	15,735.20
Everett Westcott Estate, for Endowment (additional)	46,600.00
	$312,723.87

Miscellaneous Gifts:

Alba Pharmaceutical Company, for Research	$2,000.00
Sir Douglas Alexander, for Research	9,849.75
American Academy of Arts and Sciences, for Research	1,000.00
American Philosophical Society, for Salaries and Research	2,250.00
Anonymous, for Student House Rental	6,000.00
Anonymous, for Research in Electrical Engineering	7,400.00
Contributions to Bursar's Fund	20.00
Contributions to Course XV — Accounting Research	500.00
Contributions for Thirty-Six Sailing Dinghies	9,000.00
Contributions to Expenses, Sailing Project and Equipment	1,852.80
Contributions to Research Associates Fund	31,200.00
William Emerson, for City Planning	1,666.67
Francis W. Fabyan, for Ceramics	125.00
Friends of the Library, Subscriptions	220.00
General Electric Company, for Course VI-A	3,750.00

Geological Society of America, for Salary	$1,025.00
L. J. and M. E. Horowitz for Course in Building Construction	9,500.00
John R. Macomber, for Course XV	200.00
Mrs. F. J. Moore, for Crafts Library	500.00
Professors Fund, Contribution	800.00
Rockefeller Foundation, for Research	26,600.02
Contribution to Dean's Special Fund	100.00
E. G. Senter, Jr., for Dormitory Board, Special	100.00
Alfred P. Sloan, Jr., for Graduate Scholarship	1,000.00
Estate of H. W. Underwood, for Crafts Library	150.00
	$116,809.24
Total Capital and Miscellaneous Gifts	$429,533.11

The new Sailing Pavilion constructed this spring on the river front, opposite Walker Memorial, is the only addition to our plant. More than one-half the cost of the construction of this building, together with the entire cost of the thirty-six dinghies and other equipment which it houses, was defrayed by the contributions of generous alumni and friends. The balance was met by an appropriation from the Edmund Dana Barbour Fund.

Numerous alterations and betterments have been completed during the year, notably a new high speed elevator, modern air conditioning and new lighting for the Library, also the installation of humidity and temperature control apparatus throughout the units of the main building, the benefits from which should be noticeable during the coming year.

SUMMARY OF OPERATING INCOME AND EXPENSE

1934–35 — 1935–36

				Per Cent of Total
Income from Students	increased	$14,000 to	$1,286,122.92	47.4
Income from Investments	increased	11,000 to	1,285,716.75	47.4
Income from Other Sources	decreased	6,000 to	142,461.95	5.2
			$2,714,301.62	100
Academic Expenses	increased	$42,000 to	$1,784,849.55	65.8
Administration Expenses	increased	6,000 to	322,770.05	11.9
Plant Expenses*	decreased	14,000 to	*316,303.82	11.7
Miscellaneous Expenses (Largely Special Appropriations)	decreased	18,000 to	285,763.51	10.6
			$2,709,686.93	100

* Lowest since 1919.

As indicated above, income exceeded expense by $4,614.69. This amount, together with credits as a result of previous years' operation amounting to $4,021.67, was applied to the reduction of the Institute's operating deficit (since 1865) which now stands at $16,314.86.

The Book Value of the Endowment Funds, $32,327,617.52, is an increase of $560,000. Of this $312,700 is accounted for by capital gifts. Of the balance, $244,000 is the result of investment changes increasing the Endowment Reserve Fund. This now stands at $379,443.94.

The changes which are found in the investment list, and there are many, are almost entirely accounted for by refunding operations in the quest for lower interest rates. Approximately $3,000,000 of bonds were called during the past year. Reinvestment of the proceeds has been to a considerable extent in United States Government Bonds.

The general investment list as of June 30, figured at market, shows 44.5 per cent in stock holdings (37 per cent last year), 53.6 per cent bonds and the balance in real estate and mortgages. The market value of all securities held by the Institute was 113 per cent of their Book Value. This figure was 102.5 per cent a year ago.

The total cash received as income from all investments and allocated to the Funds gave a yield of 4.67 per cent. The yield for 1935 was 4.72 per cent; for 1934 4.53 per cent. This yield is, of course, figured on the *book* value of the Funds. The yield of all Institute investments on their own *market* value as of June 30 was 3.94 per cent.

September 1, 1936

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 30, 1936, which also includes a cumulative statement of the receipts and disbursements for all previous years, 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:

Mr. Charles Hayden, *Chairman*

Mr. Gerard Swope	Mr. John E. Aldred
Mr. Edwin S. Webster	Dr. Karl T. Compton
Mr. Pierre S. du Pont	Mr. 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*	*Fiscal Year Ended June 30, 1936*	*Total*
Subscriptions received from Contributors in Cash	$654,792.25	$25,000.00	$357,634.18	.....	$36,500.00	$131,500.00	$1,205,426.43
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	$131,500.00	$1,293,220.18
Income on Securities and Interest on cash on hand	17,966.01	18,202.66	25,423.65	$33,133.29	21,025.53	19,042.06	134,793.20
Profit on Securities sold . . .	.....	.....	.....	13,939.75	8,934.35	21,672.88	44,546.98
TOTAL RECEIPTS	$745,852.01	$54,202.66	$386,757.83	$47,073.04	$66,459.88	$172,214.94	$1,472,560.36
†Remitted to Institute for Loans to Students	53,848.00	173,484.01	189,695.92	169,190.05	89,482.30	27,111.72	702,812.00
BALANCE OF FUND . . .	$692,004.01	*$119,281.35	$197,061.91	*$122,117.01	*$23,022.42	$145,103.22	$769,748.36

* Deficit for year. † See Schedule P.

STATUS OF FUND AT JUNE 30, 1936

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*
$25,000	Anaconda Copper Mfg. Co. 4½s 1950	$24,625.00
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
400	Bklyn. Man. Trans. 6% Pfd A	39,680.00
100,000	Bklyn. Man. Trans. 4½s 1966	100,000.00
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
1,000	Radio Corp. of Am. Pfd. A	54,800.00
	Prepaid Income on Investment	400.00
		$434,147.50
	TOTAL INVESTMENTS	$521,944.51
	Cash on Hand	$247,803.85
	TOTAL FUND	$769,748.36

* Includes subsequent stock dividends.

Report of the Trustees of the Massachusetts Institute of Technology Pension Association

To the Corporation of the Massachusetts Institute of Technology:

Dear Sirs:

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

BALANCE SHEET, JUNE 30, 1936

Assets

Cash	$99,581.94
Investments (as listed on page 8)	959,117.34
Total	$1,058,699.28

Liabilities

Teachers' Annuity Fund (5% salary deduction, plus interest)	$549,975.36
*M. I. T. Pension Fund (3% appropriation, plus interest)	349,959.23
Special Reserves for Annuity Payments (22 Annuitants)	116,237.70
Total Liabilities	$1,016,172.29
Reserve Fund (surplus)	42,526.99
Total	$1,058,699.28

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

Par	*Investments* (as above)			*Book Value*
$50,000	United States of America	3%	1948	$50,514.00
10,000	Chile Copper Company	5%	1947	9,587.50
25,000	Scovill Mfg. Co.	5½%	1945	24,750.00
30,000	Shell Union Oil Co.	3½%	1951	29,175.00
20,000	Texas Corp., Conv. Deb.	5%	1944	20,234.00
32,000	United Biscuit Co. of America	5%	1950	32,415.00
35,000	Alabama Power Co.	5%	1946	36,220.00
35,000	Amer. Tel. & Tel. Co.	5%	1946	35,695.00
30,000	Bell Tel. Co. of Pa.	5%	1948	31,990.00
10,000	Cedars Rapids Mfg. & Pr. Co.	5%	1953	10,000.00
24,000	Connecticut Light & Power Co.	5%	1962	22,865.00
35,000	Detroit Edison Company	4%	1965	37,481.00
29,000	Mississippi River Power Co.	5%	1951	29,358.00
25,000	Narragansett Electric Co.	5%	1958	25,212.00
40,000	N. Y. Power & Light Corp.	4½%	1967	39,499.62
40,000	Public Service Elec. & Gas Co.	4%	1971	40,522.00
35,000	Southern Cal. Edison Co.	3½%	1939	36,096.00
30,000	Tennessee Elec. Power Co.	5%	1956	29,900.00
20,000	Western Union Tel. Co.	5%	1938	18,597.70
50,000	Atch. Top. & Santa Fe	4½%	1948	55,310.00
25,000	Atlantic Coast Line, 1st	4%	1952	24,753.15
25,000	Baltimore & Ohio R.R.	4%	1948	25,216.00
10,000	Canadian National Rwy.	4½%	1957	9,775.00
25,000	Canadian Pacific Rwy.	5%	1944	25,332.00
30,000	Chicago, Burlington & Quincy R.R.	3½%	1949	29,399.08
5,000	Chicago & North Rwy. Eq. Tr.	5%	1937	5,000.00
40,000	Chicago Union Station	3¾%	1963	42,082.00
16,000	Kansas City, Mem. & Burl. R.R.	5%	1934	16,000.00
40,000	Kansas City Terminal	4%	1960	41,886.00
30,000	Long Island R.R.	4%	1949	29,775.00
25,000	Pere Marquette Rwy. Co.	4½%	1980	24,812.50
35,000	Southern Pacific	4%	1955	33,638.79
35,000	Virginian Railway Co.	3¾%	1966	36,026.00
				$959,117.34

The market value of these securities as of June 30, 1936 was $998,000.

C. B. BREED
K. T. COMPTON
H. S. FORD
R. E. FREEMAN
F. R. HART
Trustees.

Respectfully submitted,

HORACE S. FORD,
Treasurer.

September 16, 1936.

SCHEDULE A

FINANCIAL RESULT OF OPERATION FOR YEAR ENDED JUNE 30, 1936

	Regular Courses Budget	*Research and Funds Non-Budget*	*Total*
Total Income and Receipts (Schedule B)	$2,714.301.62	$1,595,890.34	$4,310,191.96
Total Expenditures (Schedule C)	2,709,686.93	1,063,338.47	3,773,025.40
Excess Income, Budget Operation	$4,614.69		
Excess Income and Receipts, Non-Budget Operation — Added to Funds		$532,551.87	
Net Excess Income and Receipts Total Operation			$537,166.56
Profit and Loss balance from previous years' operation (Schedule S)	4,021.67		
Total Available for Reduction of Current Deficit (Schedule S)	$8,636.36		

SCHEDULE B
INCOME AND RECEIPTS FOR YEAR 1935–1936

	Operating Income Budget	*Other Income and Receipts Non-Budget*	*Total*
INCOME FROM STUDENTS:			
(*a*) Tuition Fees	$1,255,040.77	.....	.....
Locker Fees	1,406.99	.....	.....
Entrance Examination Fees	1,505.00	.....	.....
Condition Examination Fees	4,695.00	.....	.....
Late Registration Fees	979.00	.....	.....
Dormitories (Net), Schedule B-1	22,496.16	.....	.....
	$1,286,122.92	.....	$1,286,122.92
INCOME FROM INVESTMENTS:			
Total (Schedule M)	$1,285,716.75	$216,040.35	$1,501,757.10
INCOME FROM OTHER SOURCES:			
Federal Aid from Acts, 1862–90	$22,255.00	.....	.....
Division of Laboratory Supplies	10,516.37	.....	.....
Trustees H. C. Frick Estate	2,650.00	.....	.....
Contributions (Schedule B-2)	17,416.67	.....	.....
Appropriations (Schedule B-3)	76,688.86	.....	.....
U. S. Navy Torpedo Research	1,576.42	.....	.....
Huntington Hall Rental	3,500.00	.....	.....
Walker Building, Boston	7,500.00	.....	.....
Miscellaneous	358.63	.....	.....
	$142,461.95	.....	$142,461.95
CURRENT FUNDS EARNINGS:			
Total (Schedule R)	.....	$383,156.81	$383,156.81
ENDOWMENT FUNDS ADDITIONS			
Total (Schedule M)	.....	$996,693.18	$996,693.18
TOTALS (Schedule A)	$2,714,301.62	$1,595,890.34	$4,310,191.96

(*a*) TUITION FEES —	Cash, Institute Year 1935–36	$885,750.27
	Cash, Summer Session 1935	89,902.02
	Fees Receivable	881.48
	Undergraduate Scholarships	70,820.00
	Graduate Scholarships and Awards	83,210.50
	Technology Loan Fund, Loans	115,676.50
	Emerson Fund, Awards	3,800.00
	Total	$1,255,040.77

SCHEDULE C

EXPENDITURES FOR YEAR 1935–1936

	Operating Expense Budget	*Other Expenditures Non-Budget*	*Total*
ACADEMIC EXPENSES:			
Salaries of Teachers (C-1)	$1,436,973.88	.....	.....
Wages Accessory to Teaching (C-1)	51,924.18	.....	.....
Wages, Laboratory Service (C-1)	114,530.75	.....	.....
Department Expenses (C-2)	123,716.53	.....	.....
General Library (C-3)	57,704.21	.....	.....
	$1,784,849.55	.....	$1,784,849.55
ADMINISTRATION EXPENSES:			
Salaries, Officers	$90,658.27	.....	.....
Wages, Clerical Staff (C-4)	77,915.68	.....	.....
Expenses, Offices (C-5)	30,447.67	.....	.....
Bulletins and Publicity (C-6)	10,764.70	.....	.....
General Expense (C-7)	112,983.73	.....	.....
	$322,770.05	.....	$322,770.05
PLANT EXPENSES			
Wages, Building Service (C-8)	$108,653.16	.....	.....
Power Plant Operation (C-9)	94,701.51	.....	.....
Fire Insurance (Net)	4,173.32	.....	.....
Repairs and Alterations (C-10)	108,775.83	.....	.....
	$316,303.82	.....	$316,303.82
MISCELLANEOUS EXPENSES:			
Department of Hygiene (C-11)	$62,144.25	.....	.....
Camps 1935 (C-12 and C-13)	6,308.78	.....	.....
Athletic Field, Boat House and Launches (C-14)	15,985.68	.....	.....
Special Appropriations (C-16)	179,344.81	.....	.....
*Walker Memorial (C-17)	21,979.99	.....	.....
	$285,763.51	.....	$285,763.51
EXPENSES OF CURRENT FUNDS:			
Total (Schedule R)	.....	$408,183.76	$408,183.76
AWARDS FROM FUNDS:			
Total (Schedule C-18)	.....	$151,222.65	$151,222.65
PAYMENTS FROM INCOME OF FUNDS:			
Total (Schedule C-19)	.....	$23,951.57	$23,951.57
PAYMENTS FROM PRINCIPAL OF FUNDS:			
Total (Schedule C-20)	.....	$479,980.49	$479,980.49
TOTALS (Schedule A)	$2,709,686.93	$1,063,338.47	$3,773,025.40

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

SCHEDULE B-1
DORMITORY OPERATION (Net)

Income:			
From Rentals		$143,588.14	
Miscellaneous		1,706.03	
			$145,294.17
Less Refunds	$7,190.00		
Dormitory Tax Allowance	2,404.00		
			9,594.00
Total			$135,700.17
Expenses:			
Salaries		$44,846.31	
Laundry		3,000.58	
Heat, Light, Power		15,905.60	
Water		1,948.90	
Repairs		14,321.09	
Supplies	$5,591.24		
Less Inventory (June 30, 1936) (Schedule D-2)	2,726.33		
		2,864.91	
Printing, Administration, Telephone		2,670.74	
New Furniture and Furnishings		20,145.88	
Interest on Mortgage Loan (Whitney Fund)		7,500.00	
Total			113,204.01
Net Income (Schedule B)			$22,496.16

SCHEDULE B-2
CONTRIBUTIONS FOR TEACHING AND RESEARCH

Prof. William Emerson	Arch. Dept. (City Planning)	$1,666.67
Anonymous	Chemical Eng. Dept.	2,500.00
L.J. & M.E. Horowitz Foundation	Civil Eng. Dept. (Bldg. Const.)	9,500.00
General Electric Co.	Elec. Eng. Dept. (Course VI-A)	3,750.00
Total (Schedule B)		$17,416.67

SCHEDULE B-3
APPROPRIATIONS FROM FUNDS FOR TEACHING AND RESEARCH

Biology Research Fund	Biology Dept.	1,200.00
W. T. Sedgwick Fund	Biology Dept.	7,000.00
Ellen H. Richards Fund	Chemistry Dept.	600.00
Special Salary Account	Chemistry Dept.	3,008.33
Edward Whitney Fund	Civil Eng. Dept.	2,200.00
Richardson Fund	Chemical Eng. Dept.	3,200.00
Electrical Eng. Special Fund	Electrical Eng. Dept.	5,996.82
Electrical Eng. Spec. Res. Fund	Electrical Eng. Dept.	2,200.00
Associated Edison Ill. Co's Acct.	Electrical Eng. Dept.	3,333.20
J. A. Grimmons Fund	Electrical Eng. Dept.	5,000.00
Rockefeller Diff. Analyzer Acct.	Electrical Eng. Dept.	150.00
Geology Rockefeller Res. Fund	Geology Dept.	800.00
Edward Whitney Fund	Geology Dept.	6,000.00
William E. Nickerson Fund	Humanics Dept.	5,350.00
Textile Research Fund	Mechanical Eng. Dept.	5,365.06
Industrial Fund	Mechanical Eng. Dept.	5,434.94
Special 1099	Mechanical Eng. Dept.	480.00
Nat. Aero. Spec. 371	Mechanical Eng. Dept.	700.00
U.S.Navy Vibration Res. Fund	Mechanical Eng. Dept.	2,000.00
Physics Rockefeller Res. Fund	Physics Dept.	4,800.00
Nuclear Research Fund	Physics Dept.	2,400.00
Research Associates Fund	Misc. Depts.	9,470.51
Total (Schedule B)		$76,688.86

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, 1935	$56,007.66	.....	.....
Aeronautical Engineering	63,930.51	$2,896.92	$8,339.74
Architecture	67,096.70	3,656.92	2,158.00
Biology and Public Health	37,940.00	1,384.23	1,779.14
Business and Eng. Administration	55,480.00	1,585.72	.....
Chemistry	149,036.75	5,639.40	12,399.93
Chemical Engineering	63,203.53	3,506.00	3,843.58
Chemical Engineering Practice School	13,700.00	.....	.....
Civil Engineering	97,338.25	4,090.78	.....
Division of Laboratory Supplies	.....	.....	21,515.94
Drawing	24,100.00	300.00	.....
Economics	40,500.00	3,084.00	.....
Electrical Engineering	150,380.02	6,405.79	13,682.15
English and History	60,450.00	1,072.34	.....
General Eng. and General Science	1,500.00	*.....	.....
General Studies	2,100.00	.....	.....
Geology	44,897.74	1,905.00	3,672.37
Humanics	5,000.00	*.....	.....
Lantern Operation	.....	.....	1,242.61
Mathematics	57,000.00	1,162.02	.....
Mechanical Engineering	168,080.00	6,304.60	16,021.22
Military Science	7,080.00	1,003.85	.....
Mining and Metallurgy	82,965.60	2,583.62	7,750.43
Modern Languages	17,000.00	329.05	.....
Naval Architecture	35,770.00	1,519.47	1,697.74
Physics	136,417.12	3,494.47	20,427.90
Totals (Schedule C)	$1,436,973.88	$51,924.18	$114,530.75

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

SCHEDULE C-2

*DEPARTMENT EXPENSES (Net)

Department	*Expenses (Net)*
Architecture	*$5,742.75
Biology	*3,000.00
Business and Engineering Administration	*4,132.37
Chemistry	17,199.27
Chemical Engineering	*4,200.00
Chemical Engineering Practice School	7,730.00
Civil Engineering	*2,218.29
Drawing	311.65
Economics	*1,805.12
Electrical Engineering	*20,700.00
English and History	390.00
General Engineering and General Science	484.52
General Studies	123.89
Geology	*2,247.72
Humanics	350.00
Mathematics	*330.93
Mechanical Engineering	*21,231.04
Military Science	1,267.01
Mining and Metallurgy	*7,100.00
Modern Languages	243.26
Naval Architecture	976.82
Physics	*21,500.00
United States Army and Navy Officers	431.89
Total	$123,716.53

(SCHEDULE C)

SCHEDULE C-3

GENERAL LIBRARY

Salaries of Officers	$12,240.42
Wages, Clerical Staff	27,848.09
Expenses	*17,615.70
Total	$57,704.21

(SCHEDULE C)

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

SCHEDULE C-4
WAGES, CLERICAL STAFF, ADMINISTRATION OFFICES

President and Vice-President	$7,745.79
Dean of Science	928.25
Dean of Students	2,040.00
Registrar	24,541.94
Director of Admissions	6,273.68
Bursar	21,617.42
Superintendent	7,090.50
Register of Former Students	2,244.00
News Service	1,098.10
Undergraduate Scholarship and Loan Fund Board	4,336.00
Total (Schedule C)	$77,915.68

SCHEDULE C-5
EXPENSES, ADMINISTRATION OFFICES

President and Vice-President	$3,357.92
Dean of Science	178.20
Dean of Students	624.61
Registrar	11,228.93
Director of Admissions	1,282.83
Bursar	4,260.43
Treasurer	884.17
Superintendent	1,098.37
Register of Former Students	1,913.35
News Service	1,020.23
Undergraduate Scholarship and Loan Fund Board	3,283.25
Graduate School and Scholarship Committee	316.24
New Student Publicity Account	999.14
Total (Schedule C)	$30,447.67

SCHEDULE C-6
BULLETINS AND PUBLICITY

Advertising — M. I. T. Publications	$1,198.09
Printing — President's and Treasurer's Reports	1,161.00
Directory	614.00
Summer Session 1935	1,872.00
General Catalogue	5,919.61
Total (Schedule C)	$10,764.70

SCHEDULE C-7
GENERAL EXPENSE

Allowances	$24,000.00
Pensions	13,683.53
Care of Securities	20,000.00
Workmen's Compensation and General Liability Insurance, etc.	6,532.53
Taxes, Cambridge and Maine	7,377.21
Auditing	1,440.00
Dues, Fees, etc.	2,021.53
Receptions, Graduation	5,978.92
Trucking of Mail	1,047.70
Travel	8,786.10
Telephone Service	21,249.79
M. I. T. Service Accounts	1,895.70
Total	$114,013.01
Less Credits	1,029.28
Total (Schedule C)	$112,983.73

SCHEDULE C-8

WAGES, BUILDING SERVICE

Shop Foremen (net)	$2,975.27
Janitors: Supervisory and Staff	48,423.41
Night Cleaners	21,152.20
Watchmen (including Cambridge Police)	11,121.13
Window Cleaning	7,915.57
Heating and Ventilation	7,701.76
Mail, Elevators, Shipper, Stock Room, Matron, Messenger	9,363.82
Total (Schedule C)	$108,653.16

SCHEDULE C-9

POWER PLANT OPERATION (Net)

Fuel Oil	$62,939.65
Coal and Edison Steam Service (net)	3,805.28
Water	2,927.20
Supplies	2,920.76
Repairs	5,811.26
Trucking, etc.	100.61
Salaries	24,821.24
Electricity, Rogers Building	2,414.54
Oil Burning Conversion (final)	14,400.00
Total	$120,140.54
Less Transfers and Credits	25,439.03
Total (Schedule C)	$94,701.51

SCHEDULE C-10

REPAIRS, ALTERATIONS AND MAINTENANCE

Buildings 1, 2, 3, 4, 5, 6, 8, 10, 11	$41,004.29
Rogers Building, Boston	4,459.82
Buildings No. 30, 31, 33, 35, 36, 38, 46	4,454.66
Miscellaneous Small Buildings, etc.	497.96
President's House	8,154.19
Furniture	3,666.75
Elevators	1,593.22
Mains and Conduits	5,603.92
Water	8,037.70
Gas	2,445.20
Grounds, Roads, Tennis Courts, etc.	25,239.65
Building Protection	1,269.33
Rubbish	1,420.10
Undistributed (net)	929.04
Total (Schedule C)	$108,775.83

SCHEDULE C-11

DEPARTMENT OF HYGIENE

Salaries, Medical Director, Assistants and Infirmary Staff	$31,879.94	
Physical Training	4,975.29	
Medical and Other Supplies	2,229.42	
Physical Examinations	3,067.40	
Equipment	563.54	
Food Account (Net)	721.25	
Laundry	1,216.11	
Miscellaneous	161.30	
		$44,814.25
Athletic Coaches — Salaries*		17,330.00
Total (Schedule C)		$62,144.25

SCHEDULE C-12

CIVIL ENGINEERING SUMMER CAMP (1935) TECHNOLOGY, MAINE

**Income:*		
From Students and Staff	$2,926.12	
Miscellaneous	16.18	
Total Income		$2,942.30
**Expenses:*		
Travel Expense	$301.84	
Construction and Repairs	1,187.03	
Caretaker	1,440.00	
Taxes and Insurance	1,342.77	
Administration, Telephone, etc.	582.84	
Wages — Operating	720.00	
Provisions and Supplies	1,614.45	
Coal, Wood, Gas and Ice	625.14	
Express and Freight, Laundry	130.69	
Total Expense		7,944.76
Net Expense		$5,002.46

SCHEDULE C-13

MINING ENGINEERING SUMMER CAMP (1935), DOVER, N. J.

**Income:*		
From Students and Staff	$435.57	
Miscellaneous	7.18	
Total Income		$442.75
**Expenses:*		
Travel Expense	$18.97	
Repairs and Equipment	425.93	
Caretaker, Insurance, Tel., Adm., Light	875.75	
Provisions and Supplies	428.42	
Total Expense		1,749.07
Net Expense		$1,306.32
Total Expense of Camps (Schedule C)		$6,308.78

* Tuition Receipts and Staff Salary payments included in Summer Session, pp. 151 and 154.

SCHEDULE C-14

ATHLETIC FIELD, BOAT HOUSE, LAUNCHES

Athletic Field, Maintenance	$8,639.67
Boat House, Maintenance	5,373.30
Launches, Maintenance	1,972.71
Total (Schedule C)	$15,985.68

SCHEDULE C-15

DINING SERVICE (Net)

Inventory, June 29, 1935:		
Utensils	$8,454.05	
Stock	2,591.89	
		$11,045.94
Expenditures:		
Food	$56,052.06	
Salaries	37,494.35	
Light, Heat and Water	4,043.82	
Ice, Refrigeration	377.92	
Laundry	1,832.08	
Dining Room and Kitchen Equipment	1,209.64	
Repairs	1,284.47	
Printing and Advertising	1,344.62	
Administration Expense	551.96	
Insurance	638.57	
		104,829.49
Total		$115,875.43
Income:		
Coupon Books	$52,648.02	
Less Outstanding Coupons	308.59	
	$52,339.43	
Cash	53,891.03	
Dining Service Reserve Fund, to Balance	457.81	
		$106,688.27
Inventory, June 30, 1936:		
Utensils	$7,805.85	
Stock	1,381.31	
		9,187.16
Total		$115,875.43

SCHEDULE C-16
SPECIAL APPROPRIATIONS

Graduate Students and Staff Tuition Awards		$32,651.00
Undergraduate Dues		17,304.00
Pension and Insurance Plan — Staff		66,522.05
Insurance Plan — Employees		4,450.06
Society of Arts		2,212.83
Special Tuition Awards		2,250.00
Maclaurin Biography		800.00
Placement Committee		300.00
Special Services — President's Office		104.17
No. 1096, Special Repairs Building 5		2,156.40
No. 1097, Special Pension		900.00
No. 1106, Engineers Council for Professional Development		400.00
No. 1114, New Diploma Design		500.00
No. 1117, Visiting Committee Reports		204.50
No. 1120 and 1163, President's Fund		1,265.75
No. 1147, Special Lighting for Drafting Rooms		1,085.00
No. 1160, Sailing Pavilion Operation, 1935–36		600.00
No. 1161, Walker Memorial Concert — Musical Clubs		75.00
Publicity:		
No. 1093 and 1173, Services	$1,625.00	
No. 1104, Technology Review	1,000.00	
No. 1104, Science Leaflet	400.00	
No. 1104, Research Reports	1,500.00	
No. 1118, Honoraria	1,000.00	
No. 1121, Descriptive Geometry Film	1,000.00	
No. 1127, News Bulletin	600.00	
No. 1155, Technology Movie	40.00	
No. 1159, Alumni Day	549.68	
No. 1166, High Speed Movies	650.00	
Open House	1,192.31	
St. Louis Exhibit	172.11	
Register of Former Students	1,488.97	
High School Visitors	78.89	
Techniques for Director of Admissions	148.20	
President's Letter to Alumni	1,220.88	
		12,666.04
To Departments:		
Biology for Food Research		2,200.00
Business and Engineering No. 1092		300.00
Chemical Engineering No. 1126		163.00
Civil Engineering:		
Soil Mechanics	$1,300.00	
River Hydraulic Laboratory	300.00	
Cement Research	2,000.00	
		3,600.00
Economics and Social Science No. 1101		1,216.66
Electrical Engineering:		
Round Hill	$1,217.13	
No. 1102	500.00	
No. 1122	205.00	
Revision of Curriculum	900.00	
No. 1165	77.20	
Course VI-A Travel	1,000.00	
Differential Analyzer	2,400.00	
		6,299.33
Geology No. 1096		1,200.00
Library No. 1011		300.00
Mathematics No. 1108		500.00

SCHEDULE C-16 — *Continued*

SPECIAL APPROPRIATIONS

Mechanical Engineering:		
No. 1107	$334.00	
No. 1124	300.00	
No. 1143	250.00	
Applied Mechanics Journal	250.00	
Textile Research School	559.57	
		$1,693.57
Mining Engineering No. 1103		350.00
Physics:		
No. 1065	$1,500.00	
No. 1109	343.45	
Nuclear Research	13,232.00	
		15,075.45
Total (Schedule C)		$179,344.81

SCHEDULE C-17

WALKER MEMORIAL (Net)

Income:		
Games (Net)		$1,827.70
Expenses:		
Salaries	$7,906.85	
Light, Heat, Power	5,303.38	
Water	633.26	
Repairs, Alterations, Maintenance	9,170.94	
Trucking, Administration	150.44	
Equipment, Supplies, Magazines and Papers	642.82	
Total		23,807.69
Net Expense (Schedule C)		$21,979.99

SCHEDULE C-18

AWARDS FROM FUNDS

Teachers' Fund, for Retiring Allowances	$20,360.00
Robert A. Boit Fund, for Prizes	245.00
Class of 1904 Fund, for Prize	15.00
Arthur Rotch Prize Funds, for Prizes	400.00
James Means Prize Fund, for Prizes	100.00
Roger Defriez Hunneman Fund, for Prizes	50.00
Samuel W. Stratton Fund, for Prizes	103.15
Frances and William Emerson Fund, for Student Aid	4,980.00
Bursar's Fund, for Student Loans	1,350.00
Dean's Fund, for Student Loans	790.00
Edward Austin Fund, for Graduate Scholarships	18,000.00
Jonathan Whitney Fund, for Graduate Scholarships	22,859.50
Misc. Funds, for Graduate Scholarships and Fellowships	8,150.00
Misc. Funds for Undergraduate Scholarships	70,820.00
Jonathan Whitney Fund, for Technology Christian Association	3,000.00
Total (Schedule C)	$151,222.65

SCHEDULE C-19

PAYMENTS FROM INCOME OF SPECIAL FUNDS

Walter S. Barker, for Books	$ 409.00	
Frank Harvey Cilley, for Books, etc.	3,290.75	
Charles Lewis Flint, for Books	162.22	
William Hall Kerr, for Books	9.31	
George A. Osborne, for Books	185.05	
Technology Matrons' Fund, for Teas	426.33	
John Hume Tod, for Books	114.97	
Theodore N. Vail, for Vail Library	1,600.00	
Ednah Dow Cheney, for Margaret Cheney Room	499.29	
Edward D. Peters, for Mineralogy Department	283.65	
F. Jewett Moore, for Chemical Department	709.43	
F. W. Boles Memorial, for Architectural Department	354.46	
Edmund K. Turner, for Annuity and Tax	2,068.25	
Pratt Naval Architectural, for Nautical Museum and Annuity	2,485.14	
Crosby Honorary, for Geology	68.00	
Arthur Rotch, for Books	188.80	
Ellen H. Richards, for Research	630.93	
Jonathan Whitney Fund, for Expenses	478.08	
Eben S. Draper Fund, for Expenses	24.81	
William Lyman Underwood Fund, for Expenses	9.00	
Malcolm Cotton Brown Fund, for Expenses	12.44	
Susan H. Swett Fund, for Expenses	17.63	
Albert G. Boyden Fund, for Expenses	57.78	
Frances E. Weston Fund, for Expenses	6.00	
Undergraduate Dues Athletic Reserve Fund, for Expenses	149.07	
Samuel Cabot Fund, for Chemical Engineering Dept.	2,500.00	
Crane Automotive Research, for Aero. Eng. Dept.	721.09	
George Blackburn Memorial Fund, for Expenses	386.65	
Classes '23, '24, '25 Endowment Funds, for Premiums	790.47	
Edwin A. Wyeth Fund, for Annuity and Expenses	5,312.97	
Total (Schedule C)		$23,951.57

SCHEDULE C-20

PAYMENTS FROM PRINCIPAL OF FUNDS

Endowment Res. Fund, Account Sales of Securities	$321,142.67	
Edmund D. Barbour Fund, for Sailing Pavilion	13,113.89	
George W. Hamilton Fund, for Library Alterations and Equipment	29,999.18	
Industrial Fund, for Research	12,209.94	
John L. Mauran Fund, for Architectural Dept.	5,000.00	
Rockefeller Fluid Research, for Research	19,802.00	
Professors' Fund, for Special Payments	11,500.00	
M. I. T. Insurance Fund, for Premiums	26,503.44	
Albert Fund, for Student House Expenses	2,656.99	
M. I. T. Insurance Special Fund, for Annuities	3,937.32	
Textile Research Fund, for Research	5,365.06	
W. T. Sedgwick Fund, for Biology Department	7,000.00	
Edward Whitney Fund, for Civil Eng. and Geology	8,200.00	
C. B. Richardson Fund, for Chemical Engineering	3,200.00	
John A. Grimmons Fund, for Electrical Engineering	5,000.00	
William E. Nickerson Fund, for Humanics	5,350.00	
Total (Schedule C)		$479,980.49

SCHEDULE D
TREASURER'S BALANCE SHEET

1
ENDOWMENT FUNDS, ASSETS

Securities and Real Estate (Schedule H)	$32,186,810.81
Cash: For Investment (Schedule D-3)	138,417.94
Total	$32,325,228.75

2
STUDENT LOAN ASSETS

Notes Receivable (Schedule P)	$750,986.77
Total	$750,986.77

3
CURRENT ASSETS

Cash: For General Purposes (Schedule D-3)	$8,534.73
Accounts Receivable (Schedule D-1)	23,272.67
Students' Fees, Receivable	881.48
Students' Deposits, Receivable	634.97
Deposit on Fire Insurance Account	41,805.00
Inventories and Advances for 1935–36 (Schedule D-2)	80,269.07
Deferred Expense Account, Graduate Dormitories	20,000.00
Current Deficit (Schedule S)	16,314.86
Total	$191,712.78

4
PLANT ASSETS

Land, Buildings, and Equipment	$15,762,292.50
Total (Schedule J)	$15,762,292.50
Total Assets June 30, 1936	$49,030,220.80

SCHEDULE D

JUNE 30, 1936

1

ENDOWMENT FUNDS, CAPITAL

Endowment Funds (Schedule M)	$32,325,228.75
Total	$32,325,228.75

2

STUDENT LOAN CAPITAL

Total (Schedule P)	$750.986.77
Total	$750,986.77

3

CURRENT LIABILITIES

Current Funds (Schedule R)	$109,857.25
Accounts Payable	7,118.54
Students' Fees and Deposits (Schedule D-4)	74,736.99
Total	$191,712.78

4

EDUCATIONAL PLANT CAPITAL

Endowment for Educational Plant	$15,762,292.50
Total (Schedule K)	$15,762,292.50
Total Liabilities June 30, 1936	$49,030,220.80

SCHEDULE D-1
DETAIL OF ACCOUNTS RECEIVABLE

Division of Industrial Coöperation	$7,361.15
Income Receivable June 30, 1936	7,685.69
Research Corporation	2,500.00
Sailing Pavilion, Deferred Contributions	1,250.00
Miscellaneous Accounts	4,475.83
Total (Schedule D)	$23,272.67

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

Summer Session Salaries, Advanced	$2,970.00
Civil Engineering Summer Camp 1936, Advanced	268.04
Mining Engineering Summer Camp 1936, Advanced	27.10
Premiums Paid on Unexpired Insurance	3,536.63
Inventories — Notes held by Coöperative Society and M.I.T.	3,326.70
Dormitory Supplies	2,726.33
Dining Service, Food, Utensils, etc.	9,187.16
Fuel Oil	1,426.75
Walker Memorial Games, Candy, Cigars, etc.	245.52
Letter Shop Supplies	877.46
Stamps	329.11
Air Travel Scrip Book	371.10
Building and Janitors' Supplies	1,968.63
Architectural Students' Supply Room, Stock	1,171.54
Stock Room: Pipe, Fittings, Lumber, Hardware, Paint, Oil, Glass and Miscellaneous Supplies	12,824.58
Photostat Service, Supplies, Equipment, etc.	777.25
Photographic Service, Supplies and Equipment	3,381.95
Division of Laboratory Supplies: Chemicals, Glassware, Platinum, etc., also Office Supplies	32,636.97
Blue Print Service, Supplies and Equipment	2,216.25
Total (Schedule D)	$80,269.07

SCHEDULE D-3

TOTAL CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR

Total Cash Receipts	$9,839,036.72
Total Cash Disbursements	9,987,147.25
Excess of Disbursements	$148,110.53
Cash, June 29, 1935	295,063.20
Cash, June 30, 1936	$146,952.67

CASH BALANCE

Cash for Investment — on Deposit (Schedule D)		$138,417.94
Cash for Current Purposes (Schedule D)		
On Deposit	$7,478.89	
In Office	1,055.84	
		8,534.73
Total Cash (Schedule D)		$146,952.67

SCHEDULE D-4

STUDENTS' FEES IN ADVANCE, AND DEPOSITS RETURNABLE

Tuition Fees in Advance, 1936–37	$355.00
Tuition Fees, Summer Session 1936	61,636.00
Students' Deposits Returnable	2,291.49
Students' Deposits, Summer Session 1936	4,957.75
Students' Deposits in Advance 1936–37	25.00
Dormitory Rental in Advance 1936–37	107.50
Dormitory Rentals, Summer Session 1936	5,364.25
Total (Schedule D)	$74,736.99

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	4,600.00
35,000	Detroit.....	4½s	1945–56	34,345.98	1,575.00
40,000	Detroit.....	5s	1945	40,860.00	2,000.00
275,000	Ontario.....	5s	1942–59	275,551.00	13,750.00
50,000	Ontario.....	6s	1943	51,573.00	3,000.00
129,000	Ottawa.....	5s	1940–54	129,820.00	6,450.00
33,000	Ottawa.....	6s	1936–51	33,806.00	1,980.00
100,000	Quebec.....	4½s	1950	97,000.00	4,500.00
50,000	San Francisco.....	4½s	1952–54	50,520.00	2,250.00
24,325	Toronto.....	4s	1948	22,622.25	973.32
32,000	Toronto.....	5s	1939–42	31,485.80	1,600.00
50,000	Toronto.....	6s	1944–46	51,134.00	3,000.00
250,000	U. S. Treasury.....	3¼s	1945–43	268,834.00	45.14
650,000	U. S. Treasury.....	3¼s	1941	707,353.00	*6,829.51*
250,000	U. S. Treasury.....	3⅜s	1943–41	271,713.00	*843.75*
	Income from bonds sold, called or matured				4,702.18
	Total Government and Municipal Bonds			$2,917,511.11	$79,502.38
	INDUSTRIAL BONDS				
$50,000	American Radiator..	4½s	1947	$48,000.00	$2,250.00
100,000	Anaconda Copper...	4½s	1950	98,500.00	2,037.50
163,000	Armour, R. E., 1st..	4½s	1939	142,719.75	9,000.00
90,000	Chile Copper, Deb...	5s	1947	87,080.00	4,500.00
40,000	Int. Cement.....	4s	1945	40,000.00	673.89
180,000	Pocahontas Corp....	6s	1943	135,395.38	11,267.49
89,000	Pure Oil Co.....	4¼s	1950	95,620.91	605.76
100,000	Remington Rand A...4½s		1956	101,950.00	.....
100,000	Scovill Mfg.....	5½s	1945	99,000.00	5,500.00
100,000	Shell Union Oil Co...	3½s	1951	99,000.00	*106.95*
17,000	Smith & Wesson 1st.	5½s	1938	16,830.00	935.00
100,000	Socony-Vac. Oil Corp.	3½s	1950	102,089.00	1,419.44
49,000	Texas Corp.....	5s	1944	49,271.00	3,750.00
100,000	United Drug.....	5s	1953	100,000.00	5,000.00
50,000	Woodward Iron, 1st	5s	1952	42,750.00	.....
	Income from sales, calls and maturities				37,980.91
	Total, Industrial Bonds			$1,258,206.04	$84,813.04

Items under Net Income shown in *italics* indicate accrued interest paid.

Schedule H (*Continued*)

Shares		*Book Value*	*Net Income*
	*INDUSTRIAL STOCKS		
4,500	Air Reduction	$158,703.97	$8,250.00
250	Algonquin Printing	67,500.00	1,000.00
1,000	Allied Chem. and Dye	159,625.38	4,200.00
1,500	American Can	179,585.97	7,500.00
1,070	Anaconda Copper	29,694.00	267.50
1,000	Beech-Nut Packing	83,851.27	4,250.00
2,000	Borden	47,638.33	3,200.00
1,000	Borg-Warner	55,201.24	1,250.00
2,000	Caterpillar Tractor	92,194.13	4,500.00
4,000	Cent. Aguirre Asso.	114,020.16	8,000.00
420	Cerro de Pasco	21,720.00	1,630.00
2,700	Continental Can	144,344.59	7,125.00
2,000	Corn Products Ref.	147,043.90	6,000.00
2,000	Curtis Pub., Pfd.	193,348.24	12,250.00
1,500	Draper Corp.	85,882.00	6,000.00
2,000	duPont de Nemours	188,389.38	11,300.00
20,000	Eastman Kodak	1,736,516.00	132,187.50
7,700	General Electric	123,209.60	6,130.00
5,076	General Motors	174,538.96	17,703.00
3,000	Gold Dust	48,364.12	3,600.00
2,500	Humble Oil and Ref.	155,639.56	1,500.00
1,500	Inland Steel	163,075.83	1,875.00
1,050	Inter. Bus. Mach.	143,472.31	6,165.00
3,000	Inter. Harvester	113,863.98	2,700.00
5,065	Inter. Nickel, Canada	133,846.82	4,811.76
2,000	Johns-Manville	150,760.43	2,375.00
1,000	Liggett & Myers, B.	107,401.19	5,000.00
2,500	R. H. Macy	119,692.70	5,000.00
2,100	Minn.-Honeywell Regulator	57,428.43	3,500.00
2,750	Monsanto Chemical	130,413.44	5,000.00
5,000	National Biscuit	165,768.74	8,000.00
2,000	National Steel	158,926.15	1,312.50
2,000	Owens-Illinois Glass	178,982.14	8,600.00
1,500	J. C. Penney Co.	116,588.70	6,375.00
1,000	Philip Morris, Ltd.	49,355.69	700.00
2,500	Pittsburgh Plate Glass	117,865.55	10,000.00
3,000	Procter & Gamble	122,127.26	5,250.00
497	Pullman	36,961.83	931.89
....	Quebradas Co.	.....	400.00
1,000	Sears, Roebuck	56,212.80	2,000.00
1,000	Shell Un. Oil, Conv. Pfd.	97,750.00	.....
1,000	Sherwin Williams	100,988.10	4,000.00

Common except as indicated.

Schedule H (*Continued*)

Shares		*Book Value*	*Net Income*
	INDUSTRIAL STOCKS (*Continued*)		
3,000	Standard Brands	$65,850.36	$2,550.00
3,500	Standard Oil, Cal.	123,724.11	3,850.00
1,000	Standard Oil, Ind.	34,012.50	1,150.00
4,500	Standard Oil, N. J.	189,542.70	6,750.00
600	Stevens Linen	39,000.00	9,000.00
612	Texas Corp.	15,075.00	600.75
2,540	Texas Gulf Sulphur	91,339.08	5,080.00
1,500	Timken Roller Bearing	106,312.70	3,600.00
4,000	Union Carbide & Carbon	190,674.31	7,200.00
1,000	Underwood-Elliott-Fisher	91,176.25	875.00
1,000	United Carbon	52,325.78	2,400.00
5,357	United Fruit	220,979.50	16,071.00
2,542	United Shoe	181,021.56	11,400.25
1,000	U. S. Steel, Pfd.	103,412.85	2,000.00
2,500	Woolworth	128,762.70	6,000.00
	Income from stocks sold		6,279.75
	Total, Industrial Stocks	$7,961,702.29	$416,645.90

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
58,000	American Tel. & Tel.	5s	1946	56,972.93	2,975.00
1,000	American Power & Light.	6s	2016	971.25	.....
225,000	American Tel. & Tel.	5s	1960	216,928.00	11,250.00
200,000	Appal. El. Pr., 1st.	5s	1956	203,098.00	10,000.00
70,000	Ark. Power & Lt., 1st.	5s	1956	70,642.00	3,500.00
150,000	Bell Tel. of Penn.	5s	1948	164,272.00	7,500.00
50,000	Blackstone Val.G&E.1st	5s	1939	50,019.00	2,500.00
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
51,000	Columbia G. & E.	5s	1952	44,336.33	2,525.00
40,000	Conn. Light & Power,1st	7s	1951	37,673.42	2,870.00
52,000	Conn. Light & Power,1st	4½s	1956	49,465.00	2,340.00
75,000	Cons. Gas, N. Y.	4½s	1951	75,412.00	3,375.00
100,000	Cons. Edison, N. Y.	3¼s	1946	101,626.25	*135.41*
248,000	Consumers Power, 1st.	4s	1944	248,064.00	9,920.00
50,000	Cont. Gas & El.	5s	1958	42,500.00	2,500.00
100,000	Cumberl'd City,P.&L.1st	4½s	1956	94,362.50	4,500.00
51,000	CumberlandTel.&Tel.1st	5s	1937	50,229.00	2,550.00
100,000	Dayton Pr. & Lt.	3½s	1960	102,624.00	1,108.33

Items under Net Income shown in *italics* indicate accrued interest paid.

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	PUBLIC UTILITY BONDS (*Continued*)				
$100,000	Detroit Edison.....	5s	1952	$104,913.00	$5,000.00
100,000	Detroit Edison.....	4½s	1961	100,000.00	4,500.00
150,000	Eastern Gas&Fuel Assoc.	4s	1956	142,875.00	*766.67*
100,000	El Paso Nat. Gas A	4½s	1951	98,500.00	*137.51*
50,000	Fall River Elec.Lgt.,1st	5s	1945	50,842.00	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	5,000.00
173,000	Hyd. Power-Niag.Falls	5s	1951	165,139.00	8,650.00
50,000	Indianapolis Water, 1st	5½s	1953	48,250.00	2,750.00
100,000	Jersey Cent. Pr.&Lt.,1st	5s	1947	102,205.00	5,000.00
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
100,000	Memphis Pr. & Lt.,1st..	5s	1948	94,720.49	5,000.00
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
1,000	National Pr. & Lt.....	6s	2026	1,007.00	.....
150,000	N. Orleans Pub.Serv.,1st	5s	1952	134,375.00	7,500.00
100,000	New York Pr. & Lt.,1st.	4½s	1967	95,571.01	4,500.00
200,000	New York Telephone,1st	4½s	1939	199,843.36	9,000.00
100,000	North American.....	5s	1961	101,080.00	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	5,000.00
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
100,000	Oklahoma Nat. Gas.....	4½s	1951	98,500.00	*587.52*
50,000	Ontario Power, 1st.....	5s	1943	49,312.50	2,500.00
175,000	Pacific G. & E. 1st.....	6s	1941	177,281.00	10,500.00
75,000	Pacific Tel. & Tel., 1st..	5s	1937	73,915.10	3,750.00
165,000	Penn-Ohio Edison.....	5½s	1959	168,494.00	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	91,781.00	5,400.00
75,000	Providence Gas, 1st.....	4s	1963	74,437.50	3,000.00
70,000	Pub. Serv. El.&Gas, 1st	4s	1971	66,362.50	2,800.00
99,000	Pub. Serv., No. Ills.,1st .	4½s	1980	97,294.72	4,455.00
100,000	ShawiniganWater&Pr.,1st	4½s	1967	97,218.75	4,500.00
50,000	Sierra Pacific Pr., 1st....	5½s	1957	44,875.00	2,750.00
100,000	Sou. Bell Tel.&Tel.,1st. .	5s	1941	100,237.00	5,000.00
100,000	Southern Cal. Edison...	3¾s	1945	99,687.50	1,151.04
100,000	Southern Cal. Gas, 1st...	4½s	1961	89,250.00	4,500.00
50,000	Syracuse Lighting.....	5s	1951	54,082.00	2,500.00
48,000	Syracuse Lighting, 1st...	5½s	1954	48,419.00	2,640.00

Items under Net Income shown in *italics* indicate accrued interest paid.

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	PUBLIC UTILITY BONDS (*Continued*)				
$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
100,000	Texas Pr. & Light, 1st..	5s	1956	105,133.00	1,623.49
100,000	Union El. Lgt. & Pr., 1st.	5s	1957	98,875.00	5,000.00
100,000	Virginia El. & Pr., 1st...	4s	1955	101,210.00	2,000.00
100,000	West Penn. Pr., 1st.....	5s	1963	93,482.50	5,000.00
100,000	Western Mass.....	4s	1939	100,195.00	4,000.00
200,000	Western Union Tel.....	5s	1951	200,774.00	10,000.00
	Income from bonds sold, called or matured				87,660.22
	Total, Public Utility Bonds			$6,961,951.24	$397,240.97

Shares			
	PUBLIC UTILITY STOCKS		
3,468	American Tel. & Tel.....	$401,481.92	$31,023.00
2,000	Cons. Gas, N. Y., Pfd.....	194,975.00	10,000.00
1,000	Detroit Edison.....	147,577.02	1,000.00
381	Edison Elec. Ill., Boston.....	74,913.64	3,048.00
500	Memphis Pr. & Lt., Pfd.....	49,375.00	3,500.00
1,500	Pub. Serv. of N. J., Pfd.....	148,665.88	7,500.00
500	Stone & Webster, Inc.....	27,680.74	.....
700	West Penn Pr., Pfd.....	68,130.58	4,200.00
	Income from stocks sold.....		1,900.00
	Total, Public Utility Stocks.....	$1,112,799.78	$62,171.00

Par Value					
	RAILROAD BONDS				
$150,000	Albany & Susq., 1st.	3½s	1946	$105,000.00	$5,250.00
110,000	Atch. Top. & Santa Fe.	4s	1995	105,370.00	4,400.00
100,000	Atch. Top. & S. Fe C&A	4½s	1962	99,956.25	4,500.00
100,000	Atch. Top. & Santa Fe	4½s	1948	108,348.63	2,188.25
50,000	Atlantic Coast Line..	4½s	1964	48,875.00	2,250.00
100,000	B. & O., P., L. E. & W. Va.	4s	1941	97,337.50	1,800.00
150,000	Boston & Maine, 1st	5s	1955	150,540.00	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
76,000	Can. Nat. Eq. Tr. ..	4½s	1937-38	71,085.00	3,420.00
59,000	Canadian Pac. Eq. Tr.	5s	1944	59,668.00	2,950.00

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	RAILROAD BONDS (*Continued*)				
$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	Chic. Burl. & Quincy	4s	1958	101,193.00	4,000.00
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	65,273.00	2,925.00
100,000	Chic. & Northwestern	4s	1987	96,500.00	.....
200,000	Chic.&Northwest.1st.	4½s	2037	189,500.00	.....
85,000	Chic. & Northwestern	4¾s	1949	85,093.00	.....
5,000	Chic.&Northw.Eq.Tr.	5s	1938	5,000.00	250.00
100,000	Chic. Un. Sta. E.....	3¾s	1963	104,568.00	*1,009.89*
75,000	Cinc. Un. Term., 1st.	5s	1957	77,064.00	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
65,000	Illinois Cent. Eq.Tr..	4½s	1936–39	63,788.80	2,925.00
10,000	Illinois Cent. Eq.Tr..	5s	1937	9,825.00	500.00
75,000	Illinois Cent.....	4s	1952	67,875.00	3,000.00
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	3,700.00
8,500	Kans. City, M. & B.	4s	1934	8,287.50	680.00
150,000	Kans. City Term., 1st	4s	1960	133,875.00	6,000.00
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
100,000	Maine Central.....	4s	1945	99,250.00	1,645.84
37,500	Maine Central.....	4½s	1960	36,750.00	843.75
100,000	Mo.Pac.,1st & Ref.F.	5s	1977	99,750.00	.....
9,000	N. Y. Central,Eq.Tr.	4½s	1937	8,536.50	405.00
69,000	New York Central, B	6s	1944	79,103.00	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	513,379.00	28,920.00
100,000	Oregon R. R. & Nav.	4s	1946	99,410.83	4,000.00
100,000	Pennsylvania.....	4½s	1960	116,692.00	4,500.00
100,000	Pennsylvania.....	4½s	1965	100,648.00	4,500.00
100,000	Pennsylvania.....	4½s	1970	87,497.34	4,500.00
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

Items under Net Income shown in *italics* indicate accrued interest paid.

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	RAILROAD BONDS (*Continued*)				
$37,500	Pere Marquette, 1st	4s	1956	$37,500.00	$1,500.00
51,000	Rio Grande West., 1st	4s	1939	49,935.00	.....
5,000	St.L.,I.Mt.&S.(R&G)	4s	1933	4,812.50	200.00
83,000	St. L., Iron Mt. & So.	4s	1933	72,542.50	3,320.00
100,000	Southern Pacific, 1st.	4s	1955	95,250.00	4,000.00
212,000	Southern Pacific.....	4½s	1969	192,280.00	9,540.00
100,000	Southern Pac., Ore..	4½s	1977	97,250.00	4,500.00
100,000	Term. R.R. of St. L 1st	4½s	1939	100,045.00	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	100,385.00	4,000.00
100,000	Union Pacific.....	4½s	1967	99,354.11	4,500.00
100,000	Un. Term., Dallas, 1st	5s	1942	99,673.75	5,000.00
100,000	Virginian.....	3¾s	1966	102,232.00	*302.07*
75,000	Washington Term...	3½s	1945	68,196.37	2,625.00
	Income from bonds sold, called or matured				20,602.88
	Total, Railroad Bonds.....			$6,142,099.87	$265,988.76

Shares			
	RAILROAD STOCKS		
1,003	Atch. Top. & S. Fe, Pfd.....	$78,725.59	$5,007.50
1,531	Atch. Top. & S. Fe, Com.....	210,847.30	3,000.00
4,015	Chesapeake & Ohio.....	196,394.25	6,082.71
1,032	Delaware & Hudson.....	126,604.00	.....
1,150	Louisville & Nash.....	99,251.04	3,450.00
700	Norfolk & Western.....	99,785.56	7,000.00
2,025	Pennsylvania.....	144,698.13	2,025.00
1,000	Pere Marquette, Pr. Pref.....	80,024.40	.....
670	Southern Pacific.....	58,860.00	.....
1,600	Union Pacific.....	213,674.30	9,600.00
	Total, Railroad Stocks.....	$1,308,864.57	$36,165.21

Par Value					
	MISCELLANEOUS BONDS				
$100,000	Adams Express Co.....	4s	1947	$99,387.15	$1,788.89
100,000	Aldred Inv. Tr., deb....	4½s	1967	109,481.00	4,500.00
300,000	Equit. Off. Bldg., deb...	5s	1952	300,000.00	18,533.89
100,000	Inter. Sec. Corp.....	5s	1947	99,519.07	2,425.83
200,000	Law.Mtg.Inv.Cor.,1st ..	5½s	1940	199,500.00	9,000.00
150,000	Niagara Shares Corp....	5½s	1950	148,813.78	2,780.55

Items under Net Income shown in *italics* indicate accrued interest paid.

Schedule H (*Continued*)

Par Value		*Book Value*	*Net Income*
	MISCELLANEOUS BONDS (*Continued*)		
$11,000	Steiger Bldg., 1st..... 5½s 1952	$10,972.50	$1,548.56
	Income from bonds sold, called or matured		2,296.96
	Total, Miscellaneous Bonds	$967,673.50	$42,874.68
Shares	BANK, INSURANCE AND OTHER STOCKS		
1,500	Bankers Trust Co., N. Y.....	$89,275.00	$1,500.00
150	Boston Insurance Co.....	103,611.00	1,275.00
680	Boston R. E. Trust.....	71,661.64	1,360.00
500	Cent. Hanover Bk. & Tr., N. Y.....	53,800.00	1,000.00
50	Christiana Sec. Co.....	107,500.00	3,475.00
200	Discount Corp., N. Y.....	73,000.00	2,400.00
1,000	Firemen's Fund Ins. Co.....	106,827.50	600.00
521	First Boston Corp.....	9,898.90	1,406.70
5,228	First Nat. Bk., Boston.....	319,001.96	7,842.00
80	First Nat. Bk., N. Y.....	172,170.60	6,000.00
400	Guaranty Tr. Co., N. Y.....	128,435.54	3,102.00
1,500	Hartford Fire Ins. Co.....	93,000.00	3,000.00
1,500	National Fire Ins. Co.....	91,625.00	2,600.00
100	New England Trust Co.....	40,000.00	3,000.00
600	Old Colony Tr. Assoc.....	30,000.00	360.00
1,500	Phoenix Ins. Co.....	107,424.50	3,250.00
	Income from stocks sold		4,478.56
	Total, Other Stocks.....	$1,597,231.64	$46,649.26
	MORTGAGE NOTES		
$5,500	Adams.....	$5,500.00	$275.00
5,500	Beta Nu House Corp.....	5,500.00	275.00
4,450	Bigelow.....	4,450.00	225.00
18,250	Gamma Pi Corp.....	18,250.00	703.13
3,550	McKenzie.....	3,550.00	183.91
60,000	Martin.....	60,000.00	600.00
100,000	Old Colony Tr., Trustee.....	100,000.00	6,000.00
2,375	Orlogski.....	2,375.00	119.84
11,500	Phi Beta Eps. Corp.....	11,500.00	612.69
11,500	Phi Kappa Sigma Trust.....	11,500.00	*218.61*
12,500	Theta Chi.....	12,500.00	645.14
70,000	Walton Trust.....	70,000.00	3,500.00
	Income from mortgages sold		234.48
	Total, Mortgage Notes	$305,125.00	$13,155.58

Items under Net Income shown in *italics* indicate accrued interest paid.

Schedule H (*Continued*)

	Book Value	*Net Income*
REAL ESTATE		
Avon St. Boston	$205,632.55	$3,990.65
Franklin St., Boston	385,364.53	5,074.32
Memorial Drive, Cambridge	40,000.00	*1,570.30*
Haven Ave., Mattapan	100.00	*96.20*
Total, Real Estate	$631,097.08	$7,398.47

RECAPITULATION GENERAL INVESTMENTS

	%			
Government Bonds	9.4		$2,917,511.11	$79,502.38
Industrial Bonds	4.0	29.5	1,258,206.04	84,813.04
Industrial Stocks	25.5		7,961,702.29	416,645.90
Public Utility Bonds	22.3	25.9	6,961.951.24	397,240.97
Public Utility Stocks	3.6		1,112,799.78	62,171.00
Railroad Bonds	19.7	23.9	6,142,099.87	265,988.76
Railroad Stocks	4.2		1,308,864.57	36,165.21
Miscellaneous Bonds	3.1		967,673.50	42,874.68
Bank, Ins. & Other St.	5.2		1,597,231.64	46,649.26
Mortgage Notes	1.0		305,125.00	13,155.58
Real Estate	2.0		631,097.08	7,398.47
Total, General Investments	100%		$31,164,262.12	$1,452,605.25

Par Value	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	.....
2,000	United States	3¼s	1945	2,108.00	$37.46
	Income from bonds sold				51.25
				$12,958.00	$88.71

Shares	INVESTMENTS, COFFIN MEMORIAL FUND		
350	Light & Pr. Sec. Co. Pfd.	$35,000.00	$2,100.00
10	Un. Gas & Imp., Pfd.	973.04	50.00
		$35,973.04	$2,150.00

Items under Net Income shown in *italics* indicate excess expense over income.

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	INVESTMENTS, DRAPER FUND				
$5,000	Cons. Gas, N. Y.	4½s	1951	$5,345.00	$145.62
22,000	Ontario	5s	1959	21,890.00	1,100.00
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	1956	5,289.00	60.42
5,000	Chic. Burl. & Quincy	3½s	1949	5,011.00	175.00
24,000	Indianapolis Un. Ry.	5s	1965	23,880.00	1,200.00
	Income from bonds sold				425.00
				$93,012.50	$4,636.04
	INVESTMENTS, RICHARD LEE RUSSEL FUND				
	Income from bonds sold				$80.21
					$80.21
	INVESTMENTS, SUSAN H. SWETT FUND				
$10,000	Mass. Hosp. Life Ins.Co.			$10,000.00	$300.00
2,000	U. S. Treasury	3¼s	1941	2,138.00	11.19
	Income from bonds sold				53.47
				$12,138.00	364.66
	INVESTMENTS, WILLIAM LYMAN UNDERWOOD FUND				
$1,000	American Tel. & Tel.	5s	1960	$1,084.00	$50.00
1,000	Chic. Burl. & Quincy	3½s	1949	1,006.00	35.00
600	United States of Am.	3¼s	1941	618.00	19.51
34	Bos. W. H. & R., Com.			2,992.00	.....
20	Bos. W. H. & Rub., Pfd.			2,000.00	120.00
40	Cons. Edison, N. Y.			4,880.00	40.00
58	Ludlow Mfg. Assoc.			6,380.00	348.00
				$18,960.00	$612.51
	INVESTMENTS, FRANCES E. WESTON FUND				
$10,000	Mtge. Note, A. C. Bartlett			$10,000.00	.....
	INVESTMENTS, JONATHAN WHITNEY FUND				
$29,000	United States of Am.	3¼s	1945	$31,097.00	$232.37
20,000	Shell Union Oil	3½s	1951	19,352.55	*163.33*
20,000	Cons. Gas, N. Y.	4½s	1951	21,315.00	820.12
25,000	Detroit Edison	5s	1952	24,825.00	1,250.00
25,000	Memphis Pr. & Lt., 1st	5s	1948	24,333.85	921.25
25,000	N. Y. Telephone, 1st	4½s	1939	24,150.39	1,125.00
25,000	Pac. Gas. & Elec.	3¾s	1961	25,743.00	153.64
25,000	Southern Cal. Edison	3¾s	1960	24,760.00	441.57

Items under Net Income shown in *italics* indicate accrued interest paid.

Schedule H (*Continued*)

Par Value or Shares				*Book Value*	*Net Income*
	INVESTMENTS, JONATHAN WHITNEY FUND (*Continued*)				
$25,000	A.T.&S.Fe.,C.&A. 1st...	4½s	1962	$24,381.25	$1,125.00
25,000	Chic. Burl. & Quincy...	3½s	1949	25,054.00	875.00
35,000	Chic. Union Sta., 1st....	4½s	1963	35,147.00	1,575.00
50,000	Kans. City Term., 1st...	4s	1960	42,750.00	2,000.00
25,000	Long Island, Ref.....	4s	1949	25,074.00	954.89
12,500	Maine Central, 1st.....	4s	1945	12,500.00	250.00
12,500	Maine Central Gen. A..	4½s	1960	12,500.00	281.25
9,000	N. Y. Central, Eq. Tr...	4½s	1936	8,558.10	405.00
25,000	Southern Pac. Ry.....	4s	1955	24,471.99	247.22
8,000	Union Pacific.....	4½s	1967	8,234.00	360.00
25,000	Virginian Ry. Co.....	3¾s	1966	25,669.00	*80.73*
150,000	Mtge. Note MIT Dorm.	5s	....	150,000.00	7,500.00
	Income from bonds sold				8,808.75
				$589,916.13	$29,082.00
	INVESTMENTS, EDWIN A. WYETH FUND				
$10,000	U. S. Treasury.....	1½s	1939	$10,032.00	$65.53
2,000	U. S. Treasury.....	3s	1948	2,092.00	9.00
10,000	Shell Union Oil.....	3½s	1951	9,725.00	*107.92*
100	American Can.....			11,944.73	320.00
125	American Tel. & Tel....			13,125.00	1,631.25
250	General Motors.....			8,500.00	875.00
250	Pullman.....			11,750.00	468.75
100	Standard Oil, N. J.....			5,980.20	75.00
100	Un. Carb. & Carbon....			4,640.00	180.00
100	United Shoe Mach. Corp.			8,941.25	43.75
$10,000	Carolina Pr. & Light....	5s	1956	8,300.00	500.00
5,000	Columbia Gas & Elec....	5s	1952	4,100.00	250.00
10,000	Cons. Gas, N. Y.	4½s	1951	10,645.00	369.37
10,000	Cons. Edison, N. Y.....	3¼s	1946	10,225.00	*20.76*
10,000	Gulf States Util., 1st....	5s	1956	9,300.00	500.00
14,000	Miss. River Pr., 1st.....	5s	1951	14,738.73	750.00
16,000	Southern Cal. Edison...	3¾s	1960	15,880.00	261.67
10,000	Texas Power & Light...	5s	1956	10,532.11	142.08
15,000	Baltimore & Ohio, 1st...	4s	1948	15,256.00	600.00
5,000	Canadian Pac. Eq. Tr...	5s	1944	5,355.00	250.00
15,000	Chic. Burl. & Quincy...	3½s	1949	15,259.00	525.00
10,000	Kans. City Term., 1st...	4s	1960	10,460.00	400.00
15,000	Long Island R. R. Ref...	4s	1949	15,388.00	600.00
5,000	Pennsylvania Eq. Tr....	5s	1937	5,000.00	250.00
2,500	Southern Pacific.....	4s	1949	1,750.00	100.00
10,000	Union Pacific, 1st.....	4s	1947	10,672.00	400.00
	Income from items sold				2,700.00
				$249,591.02	$12,137.72
Grand Totals, All Investments				$32,186,810.81	$1,501,757.10

Items under Net Income shown in *italics* indicate accrued interest paid.

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
Sailing Pavilion (new)	28,849.09
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 30, 1936 (Schedule D)	$15,762,292.50

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
Appn., Barbour Fund, Field House and Sailing Pavilion	68,363.89
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.	2,622,926.80
Total, June 30, 1936 (Schedule D)	$15,762,292.50

SCHEDULE M
[1]ENDOWMENT FUNDS FOR GENERAL PURPOSES

No.	Restricted Funds	Funds, June 29, 1935	Investment Income	Other Income	Expended or Transferred	Funds, June 30, 1936
101	George Robert Armstrong	$5,000.00	$236.50	.....	$236.50	$5,000.00
102	George Blackburn Mem.	905,838.21	42,844.34	$965.76	43,230.99	906,417.32
103	Charles Choate	35,858.15	1,698.07	.....	1,698.07	35,858.15
104	Eben S. Draper	95,863.38	4,636.04	373.00	24.81	100,847.61
105	Coleman du Pont	158,939.95	9,232.96	49,966.45	9,232.96	208,906.40
107	Eastman Contract	9,498,869.55	449,297.97	.....	449,297.97	9,498,869.55
108	George Eastman (Building)	1,275,901.42	60,350.07	.....	60,350.07	1,275,901.42
109	Charles W. Eaton	243,337.03	11,508.09	.....	11,508.09	243,337.03
112	Educational Endowment	7,573,704.60	358,236.01	.....	358,236.01	7,573,704.60
113	Martha Ann Edwards	30,000.00	1,419.00	.....	1,419.00	30,000.00
114	William Endicott	25,000.00	1,182.50	.....	1,182.50	25,000.00
117	Francis Appleton Foster	1,000,000.00	47,300.00	.....	47,300.00	1,000,000.00
118	Alexis H. French	5,000.00	236.50	.....	236.50	5,000.00
119	Jonathan French	25,212.48	1,191.96	.....	1,191.96	25,212.48
121	Henry C. Frick	1,828,010.94	86,573.19	2,322.48	86,573.19	1,830,333.42
122	General Endowment	1,527,449.00	72,246.02	.....	72,246.02	1,527,449.00
123	Eliot Granger	.....	392.59	20,000.00	392.59	20,000.00
124	James Fund	163,654.21	7,743.01	.....	7,743.01	163,654.21
125	Katherine B. Lowell	5,000.00	236.50	.....	236.50	5,000.00
126	Thomas McCammon	15,000.00	709.50	.....	709.50	15,000.00
127	M. I. T. Alumni (Fund Bal.)	1,840.66	85.14	.....	.....	1,925.80
128	Kate M. Morse	25,000.00	1,182.50	.....	1,182.50	25,000.00
129	Everett Morss	25,000.00	1,182.50	.....	1,182.50	25,000.00
131	Richard Perkins	50,000.00	2,365.00	.....	2,365.00	50,000.00
132	J. W. and B. L. Randall	83,452.36	3,949.55	.....	3,949.55	83,452.36
135	Wm. Barton Rogers Mem.	250,225.00	11,834.46	.....	11,834.46	250,225.00
136	[2]Saltonstall Fund	59,944.67	2,833.27	.....	2,124.95	60,652.99
137	Samuel E. Sawyer	4,764.40	227.04	.....	227.04	4,764.40
139	Andrew Hastings Spring	50,000.00	2,365.00	.....	2,365.00	50,000.00
140	Seth K. Sweetser	25,061.62	1,182.50	.....	1,182.50	25,061.62
141	William J. Walker	23,613.59	1,116.28	.....	1,116.28	23,613.59
114	Horace Herbert Watson	34,076.69	1,608.20	.....	1,608.20	34,076.69
145	Albion K. P. Welch	5,000.00	236.50	.....	236.50	5,000.00
146	Everett Wescott	122,794.00	7,568.00	46,600.00	7,568.00	169,394.00
147	[3]George Wigglesworth	25,410.58	1,201.42	.....	1,081.28	25,530.72
148	Edwin A. Wyeth	248,044.21	12,137.72	6,381.11	12,706.99	253,856.05
		$25,451,866.70	$1,208,345.90	$126,608.80	$1,203,776.99	$25,583,044.41
	Unrestricted Funds					
151	Edmund D. Barbour	$197,021.42	$9,318.10	.....	$22.431.99	$183,907.53
152	Arthur F. Estabrook	.....	37.84	$3,200.00	37.84	3,200.00
153	Henrietta G. Fitz	10,000.00	473.00	.....	473.00	10,000.00
154	George Wyman Hamilton	.....	1,419.00	54,454.15	31,418.18	24,454.97
155	James W. Henry	8,226.08	387.86	.....	387.86	8,226.08
156	Abby W. Hunt	.....	425.70	72,000.00	425.70	72,000.00
157	Industrial Fund	77,007.85	3,311.00	1,452.50	12,209.94	69,561.41
158	Hiram H. Logan	17,000.00	804.10	.....	804.10	17,000.00
159	Hiram F. Mills	10,175.00	482.46	.....	482.46	10,175.00

[1] See alphabetical listing and description of Funds on pages 192–203.
[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 29, 1935*	*Investment Income*	*Other Income*	*Expended or Transferred*	*Funds, June 30, 1936*
161	Moses W. Oliver	$11,220.49	$529.76	.....	$529.76	$11,220.49
162	Emerette O. Patch	7,500.00	354.75	.....	354.75	7,500.00
163	Preston Player	20,000.00	946.00	.....	946.00	20,000.00
164	Charles O. Prescott	.....	1,135.20	$30,640.78	1,135.20	30,640.78
165	Robert E. Rogers	7,680.77	364.21	.....	364.21	7,680.77
168	Ellen V. Smith	25,000.00	1,182.50	.....	1,182.50	25,000.00
173	Frank G. Webster	25,000.00	1,182.50	.....	1,182.50	25,000.00
		$415,831.61	$22,353.98	$161,747.43	$74,365.99	$525,567.03

SCHEDULE M

[1]ENDOWMENT FUNDS FOR DESIGNATED PURPOSES

	Special Deposit Funds					
205	Endowment Reserve	$133,934.14	$1,299.35	$565,353.12	$321,142.67	$379,443.94
206	Albert Fund	256.99	212.85	6,000.00	2,656.99	3,812.85
207	Alpha Chi Sigma House Fund	2,388.33	113.52	10.00	.....	2,511.85
208	Anonymous (1924)	1,828.57	85.14	.....	.....	1,913.71
209	Basket Ball Fund	.....	75.68	2,200.00	.....	2,275.68
210	1923 Endowment	14,716.70	695.31	1,540.35	121.91	16,830.45
212	1924 Endowment	15,335.29	733.15	1,183.52	241.60	17,010.36
214	1925 Endowment	9,696.15	449.35	1,044.31	426.96	10,762.85
216	1926 Endowment Special	330.62	14.19	.....	.....	344.81
217	1926 Endowment	**80.38*	61.49	13,196.41	.....	13,177.52
218	1927 Endowment	9,005.38	425.70	728.23	.....	10,159.31
219	1928 Endowment	12,266.71	586.52	1,044.81	.....	13,898.04
220	1929 Endowment	6,595.12	312.18	585.12	.....	7,492.42
221	1930 Endowment	949.58	42.57	.....	.....	992.15
222	1934 Endowment	225.00	18.92	.....	.....	243.92
223	1935 Endowment	300.00	14.19	.....	.....	314.19
223a	1936 Endowment	.....	.....	400.00	.....	400.00
224	M.I.T. Teachers' Insurance	3,751.84	.....	26,740.79	26,503.44	3,989.19
225	M.I.T. Teachers' Insurance (Special)	61,169.98	3,183.29	12,790.98	3,937.32	73,206.93
226	M.I.T. Alumni Association Permanent Funds	54,512.55	2,625.15	1,628.00	.....	58,765.70
227	Louisville Technology Foundation Fund	50.00	.....	.....	.....	50.00
228	Class of 1934 Special	.....	14.19	500.00	.....	514.19
229	Class of '98 Loan	†7,252.82	345.29	106.84	.....	†7,704.95
230	Class of '74	180.97	9.46	.....	.....	190.43
231	Professors' Fund	13,111.27	141.90	800.00	11,500.00	2,553.17
233	Richards Portrait	614.12	28.38	.....	.....	642.50
235	Rockefeller Found. Research	**118.04*	.....	15,000.02	19,802.00	**4,920.02*
236	W. P. Ryan Special	3,279.43	156.09	.....	.....	3,435.52
237	Sedgwick Memorial Lecture Fund	7,868.17	378.40	425.60	.....	8,672.17
238	W. B. S. Thomas Fund	928.58	42.57	.....	.....	971.15
239	Elihu Thomson	6,764.63	321.64	.....	.....	7,086.27
240	Undergraduate Activities Trust	1,097.26	52.03	5.12	.....	1,154.41
241	Undergraduate Publications Trust	.....	718.96	16.018.00	.....	16,736.96
243	Undergraduate Dues, Res. Athletics	11,014.68	586.52	3,800.00	149.07	15,252.13
244	Undergraduate Dues, Res. Contingent	13,616.29	643.28	200.00	.....	14,459.57
		$392,842.75	$14,387.26	$671,301.22	$386.481.96	$692.049.27

[1] See alphabetical listing and description of Funds on pages 192–203.
* Overdraft.
† Exclusive of student notes receivable. (See Schedule P, page 186.)

[2]Schedule M (*Continued*)

No.		*Funds, June 29, 1935*	*Investment Income*	*Other Income*	*Expended or Transferred*	*Funds, June 30, 1936*
	FUNDS FOR SALARIES					
251	Samuel C. Cobb For General Salaries	$36,551.31	$1,731.18	.....	$1,731.18	$36,551.31
253	Sarah H. Forbes For General Salaries	500.00	23.65	.....	23.65	500.00
255	George A. Gardner For General Salaries	20,000.00	946.00	.....	946.00	20,000.00
259	James Hayward Professorship of Engineering	18,800.00	889.24	.....	889.24	18,800.00
261	William P. Mason Professorship of Geology . .	18,800.00	889.24	.....	889.24	18,800.00
263	Henry B. Rogers For General Salaries	25,000.00	1,182.50	.....	1,182.50	25,000.00
265	Nathaniel Thayer Professorship of Physics . .	25,000.00	1,182.50	.....	1,182.50	25,000.00
266	Elihu Thomson Professorship, Elec. Eng. . .	6,239.60	293.26	.....	293.26	6,239.60
		$150,890.91	$7,137.57	.....	$7,137.57	$150,890.91
	FUNDS FOR LIBRARY, READING ROOMS AND GYMNASIUM					
271	Walter S. Barker	$10,782.26	$510.84	.....	$409.00	$10,884.10
273	Ednah Dow Cheney	14,443.44	681.12	.....	499.29	14,625.27
274	Frank Harvey Cilley	84,127.27	3,977.93	.....	3,290.75	84,814.45
277	Charles Lewis Flint	5,465.19	260.15	.....	162.22	5,563.12
278	Friends of the Library	.....	.....	$220.00	.....	220.00
280	William Hall Kerr	3,437.39	156.09	.....	9.31	3,584.17
283	George A. Osborne	9,830.02	463.54	.....	185.05	10,108.51
286	Arthur Rotch, Architectural . .	6,618.54	312.18	.....	188.80	6,741.92
288	Technology Matrons' Teas . .	9,179.95	416.24	.....	426.33	9,169.86
289	John Hume Tod	3,007.52	137.17	.....	114.97	3,029.72
291	Theodore N. Vail.	40,165.18	1,901.46	.....	1,600.00	40,466.64
		$187,056.76	$8,816.72	$220.00	$6,885.72	$189,207.76
	FUNDS FOR DEPARTMENTS					
301	William Parsons Atkinson . .	$13,082.20	$614.90	.....	$614.90	$13,082.20
303	Frank Walter Boles Memorial .	29,594.58	1,381.16	.....	354.46	30,621.28
305	William E. Chamberlain . . .	7,309.77	345.29	.....	345.29	7,309.77
307	Chemical Engineering Practice	257,772.97	12,193.94	.....	12,193.94	257,772.97
309	Crosby Honorary Fund	1,772.12	85.14	.....	68.00	1,789.26
311	Susan E. Dorr	95,955.67	4,540.80	.....	4,540.80	95,955.67
312	George Eastman	400,000.00	18,920.00	.....	18,920.00	400,000.00
316	John Lawrence Mauran . . .	10,000.00	354.75	.....	5,000.00	5,354.75
317	George Henry May	5,000.00	236.50	.....	236.50	5,000.00
319	Susan Minns	40,000.00	.....	.....	.....	40,000.00
320	Forris Jewett Moore	31,539.83	1,489.95	.....	709.43	32,320.35
322	William E. Nickerson	22,840.06	946.00	.....	5,350.00	18,436.06
324	Edward D. Peters	5,924.89	279.07	.....	283.65	5,920.31
325	Pratt Naval Architectural . .	392,399.95	18,588.90	.....	18,588.90	392,399.95
326	Frances E. Roper	.....	.....	$2,000.00	.....	2,000.00
327	Arthur Rotch	25,000.00	1,182.50	.....	1,182.50	25,000.00
329	W. T. Sedgwick	89,799.41	4,209.70	.....	7,000.00	87,009.11
331	[1]Edmund K. Turner	252,260.71	11,862.84	.....	9,414.20	254,709.35
333	William Lyman Underwood . .	19,239.22	612.51	.....	9.00	19,842.73
		$1,699,491.38	$77,843.95	$2,000.00	$84,811.57	$1,694,523.76

[1] One-fourth of net income added to Fund.
[2] See alphabetical listing and description of Funds on pages 192–203.

[1]Schedule M (*Continued*)

No.		*Funds, June 29, 1935*	*Investment Income*	*Other Income*	*Expended or Transferred*	*Funds, June 30, 1936*
	FUNDS FOR RESEARCH					
343	Samuel Cabot	$54,008.11	$2,554.20	.....	$2,500.00	$54,062.31
344	Crane Automotive Research	5,344.81	331.10	$1,720.00	721.09	6,674.82
349	Ellen H. Richards	21,442.30	1,012.22	.....	630.93	21,823.59
351	Charlotte B. Richardson	46,001.08	2,128.50	.....	3,200.00	44,929.58
356	Textile Research Fund	5,365.06	.....	.....	5,365.06	.....
358	Edward Whitney	39,362.39	1,608.20	.....	8,200.00	32,770.59
		$171,523.75	$7,634.22	$1,720.00	$20,617.08	$160,260.89
	FUNDS FOR FELLOWSHIPS					
363	William Sumner Bolles	$27,483.40	$1,300.75	.....	$1,100.00	$27,684.15
364	Malcolm Cotton Brown	12,176.57	88.71	$39.18	12.44	12,292.02
366	Collamore	14,414.74	681.12	.....	600.00	14,495.86
368	Dalton Graduate Chemical	7,443.57	350.02	.....	300.00	7,493.59
374	Rebecca R. Joslin	†2,773.08	307.45	5,000.00	.....	†8,080.53
376	Wilfred Lewis	5,304.52	250.69	.....	200.00	5,355.21
378	Moore	29,262.66	1,381.16	.....	.....	30,643.82
380	Willard B. Perkins	6,590.08	312.18	.....	.....	6,902.26
382	Proctor	1,500.00	.....	.....	1,500.00	.....
384	Proprietors Locks and Canals	3,751.42	179.74	.....	.....	3,931.16
386	Henry Bromfield Rogers	25,413.40	1,201.42	.....	1,400.00	25,214.82
388	Richard Lee Russel	3,377.57	80.21	10.05	150.00	3,317.83
390	Henry Saltonstall	10,953.14	520.30	.....	500.00	10,973.44
392	James Savage	12,353.86	586.52	.....	.....	12,940.38
393	Sloan	.....	.....	1,000.00	1,000.00	.....
395	Susan H. Swett	12,020.45	364.66	6.70	517.63	11,874.18
396	Gerard Swope	138.75	.....	.....	.....	138.75
397	Frank Hall Thorp	10,641.91	501.38	.....	400.00	10,743.29
398	Louis Francisco Verges	10,561.82	501.38	.....	500.00	10,563.20
		$196,160.94	$8,607.69	$6,055.93	$8,180.07	$202,644.49
	FUNDS FOR SCHOLARSHIPS					
401	Elisha Atkins	$5,245.69	$ 245.96	.....	$250.00	$5,241.65
403	Billings Student	51,320.63	2,426.49	.....	2,000.00	51,747.12
404	Jonathan Bourne	10,877.75	515.57	.....	450.00	10,943.32
405	Albert G. Boyden	579,149.29	27,391.43	.....	25,767.78	580,772.94
406	Harriet L. Brown	7,600.40	359.48	.....	300.00	7,659.88
408	Nino Tesher Catlin	1,046.79	47.30	.....	40.00	1,054.09
411	Lucius Clapp	5,172.69	245.96	.....	200.00	5,218.65
413	Class of 1896	6,122.62	288.53	.....	250.00	†6,161.15
414	Class of 1909	.....	23.65	$1,050.00	.....	1,073.65
415	Lucretia Crocker	77,975.31	3,689.40	.....	2,050.00	79,614.71
417	Isaac W. Danforth	5,418.13	255.42	.....	200.00	5,473.55

[1] See alphabetical listing and description of Funds on pages 192–203.
* Overdraft.
† Exclusive of student notes receivable. (See Schedule P, page 186.)

[1]Schedule M (*Continued*)

No.		*Funds, June 29, 1935*	*Investment Income*	*Other Income*	*Expended or Transferred*	*Funds, June 30, 1936*
420	Ann White Dickinson	$42,355.91	$2,005.52	.....	$1,700.00	$42,661.43
421	Thomas M. Drown	52,787.72	2,497.44	.....	2,100.00	53,185.16
424	Farnsworth	5,622.73	264.88	.....	225.00	5,662.61
426	Charles Lewis Flint	5,631.53	264.88	.....	225.00	5,671.41
427	Sarah S. Forbes	3,750.97	179.74	.....	150.00	3,780.71
429	Fuel and Gas Scholarship	350.00	.....	.....	.....	350.00
431	George Hollingsworth	5,218.45	245.96	.....	200.00	5,264.41
433	T. Sterry Hunt	3,271.05	156.09	.....	125.00	3,302.14
434	William F. Huntington	5,377.14	255.42	.....	200.00	5,432.56
436	Joy Scholarships	17,541.07	827.75	.....	650.00	17,718.82
438	William Litchfield	5,486.40	260.15	.....	225.00	5,521.55
439	Elisha T. Loring	5,496.19	260.15	.....	225.00	5,531.34
441	Lowell Institute Scholarship	2,726.88	127.71	.....	100.00	2,754.59
442	Rupert A. Marden	2,060.52	94.60	.....	80.00	2,075.12
443	George Henry May	†8,357.94	402.05	$540.96	700.00	†8,600.95
445	James H. Mirrlees	2,720.03	127.71	.....	100.00	2,747.74
447	Nichols Scholarship	5,489.24	260.15	.....	225.00	5,524.39
448	Charles C. Nichols	5,486.69	260.15	.....	225.00	5,521.84
450	John Felt Osgood	5,360.72	255.42	.....	225.00	5,391.14
451	George L. Parmelee	18,946.76	898.70	.....	750.00	19,095.46
453	Richard Perkins	53,975.29	2,554.20	.....	2,100.00	54,429.49
454	Thomas Adelbert Read	21,543.33	1,016.95	.....	400.00	22,160.28
454a	William P. Ryan Memorial	3,637.95	170.28	28.55	.....	3,836.78
455	John P. Schenkl	46,928.48	2,218.37	.....	1,850.00	47,296.85
456	Thomas Sherwin	5,459.35	260.15	.....	225.00	5,494.50
458	Horace T. Smith	33,880.38	1,603.47	.....	1,300.00	34,183.85
459	Sons and Daughters New England Colony	630.14	28.38	.....	25.00	633.52
460	Samuel E. Tinkham	2,459.39	118.25	.....	100.00	2,477.64
462	F. B. Tough	†247.12	14.19	108.16	.....	†369.47
463	Susan Upham	1,186.33	56.76	.....	50.00	1,193.09
465	Vermont Scholarship	18,232.20	860.86	.....	800.00	18,293.06
467	Ann White Vose	62,398.77	2,951.52	.....	2,500.00	62,850.29
469	Arthur M. Waitt	10,407.89	491.92	.....	400.00	10,499.81
471	Louis Weissbein	4,349.01	203.39	.....	150.00	4,402.40
473	Frances Erving Weston	6,395.34	52.03	.....	206.00	6,241.37
474	Samuel Martin Weston	5,222.54	.....	.....	200.00	5,022.54
476	Amasa J. Whiting	4,817.53	227.04	.....	200.00	4,844.57
477	Elizabeth Babcock Willmann	5,065.51	236.50	.....	.....	5,302.01
		$1,240,803.79	$58,197.92	$1,727.67	$50,443.78	$1,250,285.60
	FUNDS FOR PRIZES					
481	Robert A. Boit	$5,186.59	$245.96	....	$245.00	$5,187.55
483	Class of 1904	586.79	28.38	....	15.00	600.17
485	Roger Defriez Hunneman	1,020.29	47.30	....	50.00	1,017.59
487	James Means	3,244.13	151.36	....	100.00	3,295.49
489	Arthur Rotch	7,104.81	335.83	....	400.00	7,040.64
491	Arthur Rotch, Special	9,786.98	463.54	....	.....	10,250.52
493	Samuel W. Stratton	1,780.70	94.60	....	103.15	1,772.15
		$28,710.29	$1,366.97	....	$913.15	$29,164.11

[1] See alphabetical listing and description of Funds on pages 192-203.
† Exclusive of student notes receivable. (See Schedule P, page 186.)

[2]Schedule M (*Continued*)

No.		*Funds, June 29, 1935*	*Investment Income*	*Other Income*	*Expended or Transferred*	*Funds, June 30 1936*
	FUNDS FOR RELIEF					
501	Edward Austin	$439,447.36	$20,783.62	....	$18,000.00	$442,230.98
503	Thomas Wendell Bailey	2,676.81	127.71	....	100.00	2,704.52
504	[1]Charles Tidd Baker	29,782.25	1,409.54	....	550.00	30,641.79
506	Levi Boles	11,022.92	520.30	....	450.00	11,093.22
508	Bursar's Fund	†9,859.12	520.30	$2,198.60	1,350.00	†11,228.02
510	Mabel Blake Case	27,011.60	1,277.10	....	1,050.00	27,238.70
511	Chandler	4,118.03	193.93	200.00	....	4,511.96
512	Fred L. and Florence L. Coburn	5,155.86	245.96	....	200.00	5,201.82
514	Coffin Memorial	42,037.50	2,150.00	....	2,100.00	42,087.50
516	Dean's Fund	†4,894.26	236.50	244.76	790.00	†4,585.52
518	Carl P. Dennett	†720.40	33.11	1.50	....	†755.01
520	Dormitory Fund	3,988.94	189.20	....	150.00	4,028.14
521	Frances and William Emerson	†101,320.47	4,777.30	....	4,980.00	†101,117.77
523	Norman H. George	94,319.67	4,460.39	....	3,700.00	95,080.06
525	John A. Grimmons	†8,797.20	331.10	2,322.48	5,000.00	†6,450.78
527	James H. Haste	180,835.31	8,551.84	....	7,200.00	182,187.15
529	David L. Jewell	26,125.64	1,234.53	....	1,000.00	26,360.17
530	Llora Culver Krueger	....	66.22	5,573.75	....	5,639.97
531	William B. Rogers	†27,682.69	1,419.00	5,574.10	....	†34,675.79
532	Summer Surveying Camp	†1,564.41	75.68	64.44	....	†1,704.53
534	Teachers' Fund	137,351.35	5,912.50	....	20,360.00	122,903.85
536	Samson R. Urbino	1,073.79	52.03	....	40.00	1,085.82
537	Jonathan Whitney	600,465.36	29,082.00	9,132.50	27,337.58	611,342.28
539	Morrill Wyman	72,220.11	3,415.06	....	2,900.00	72,735.17
		$1,832,471.05	$87,064.92	$25,312.13	$97,257.58	$1,847,590.52

RECAPITULATION OF FUNDS

FOR GENERAL PURPOSES					
Restricted	$25,451,866.70	$1,208,345.90	$126,608.80	$1,203,776.99	$25,583,044.41
Unrestricted	415,831.61	22,353.98	161,747.43	74,365.99	525,567.03
FOR DESIGNATED PURPOSES					
Special Deposit Funds	392,842.75	14,387.26	671,301.22	$386,481.96	692,049.27
Salaries	150,890.91	7,137.57	....	7,137.57	150,890.91
Libraries, etc.	187,056.76	8,816.72	220.00	6,885.72	189,207.76
Departments	1,699,491.38	77,843.95	2,000.00	84,811.57	1,694,523.76
Research	171,523.75	7,634.22	1,720.00	20,617.08	160,260.89
Fellowships	196,160.94	8,607.69	6,055.93	8,180.07	202,644.49
Scholarships	1,240,803.79	58,197.92	1,727.67	50,443.78	1,250,285.60
Prizes	28,710.29	1,366.97	....	913.15	29,164.11
Relief	1,832,471.05	87,064.92	25,312.13	97,257.58	1,847,590.52
Total (Schedule D)	$31,767,649.93	$1,501,757.10 (Schedule B)	$996,693.18 (Schedule B)	$1,940,871.46	$32,325,228.75 (Schedule D)

[1] One-half of the income added to the principal.
[2] See alphabetical listing and description of Funds on pages 192–203.
† Exclusive of student notes receivable. (See Schedule P, page 186.)

SCHEDULE P

STUDENT NOTES RECEIVABLE

Fund	*Notes Receivable June 29, 1935*	*Loans Made 1935–1936*	*Loans Repaid 1935–1936*	*Notes Receivable June 30, 1936*	*Interest Received 1935–1936*
Technology Loan Fund . .	$679,332.06	$124,567.50	*$89,539.54	$714,360.02	$16,779.78
Bursar's Fund	13,279.25	1,350.00	2,042.75	12,586.50	135.85
Rogers Fund	13,594.74	.....	4,305.12	9,289.62	193.98
Dean's Fund	2,110.53	790.00	226.97	2,673.56	17.79
C. E. Summer Camp Fund .	311.00	.....	61.00	250.00	3.44
Grimmons Sch. Loan Fund .	1,935.00	.....	348.00	1,587.00	34.18
Dennett Fund	665.00	.....	.....	665.00	1.50
Dean's Special Fund. . . .	.....	200.00	.....	200.00	.....
G. H. May Sch. Fund . . .	2,590.96	700.00	540.96	2,750.00	.....
F. B. Tough Fund	300.00	.....	100.00	200.00	8.16
Hygiene Special Fund . . .	3,789.58	.....	5.00	3,784.58	5.67
Class of 1898 Fund	500.00	.....	100.00	400.00	6.84
Class of 1896 Fund	.....	500.00	.....	500.00	.....
Emerson Fund	600.00	.....	.....	600.00	.....
Chemical Engineering Fund.	.....	588.00	47.51	540.49	6.04
C. W. Eaton Fund	600.00	.....	.....	600.00	.....
Total	$719,608.12	$128,695.50	$97,316.85	$750,986.77	$17,193·23

(Schedule D)

* Includes $390.35 written off — deceased borrower.

SCHEDULE R

CURRENT FUNDS

Name	Balance June 29, 1935	Income	Other Increases or Transfers	Expenditures from Income or Balances	Other Expenditures or Transfers	Balance June 30, 1936
Additional Group Ins. Fund	$33.13	$6,538.47	.....	$6,557.63	.....	$13.97
Aeronautical Engineering						
Balloon Fund	10.00	.....	.....	10.00	.....	.....
Design	*38.77	38.77	.....	.....	.....	.....
Summer Shop Course	100.00	.....	$$650.00	264.01	.....	485.99
Wind Tunnels	5,014.42	3,770.00	.....	1,692.60	$3,000.00	4,091.82
Wing Flutter Acct.	115.64	.....	.....	60.00	55.64	.....
No. 640	1,935.00	.....	.....	215.00	1,720.00	.....
Wind Tunnel Equip.	.....	.....	[2]3,000.00	2,574.93	.....	425.07
Aircraft Structures Res.	.....	500.00	.....	501.55	.....	*1.55
Hurricane Res.	.....	.....	[2]10,000.00	4,709.70	.....	5,290.30
No. 1107	.....	.....	[1]500.00	166.00	334.00	.....
No. 1015	73.88	.....	.....	73.88	.....	.....
No. 1088	166.00	.....	.....	.....	166.00	.....
Alumni Day 1936	.....	4,084.12	.....	4,084.12	.....	.....
Amer. Assoc. for the Advancement of Science — Pittsburgh Meeting.	150.00	150.00	.....	91.38	208.62	.....
Architecture: Travel. Scholarship	.....	.....	[2]1,500.00	.....	1,500.00	.....
Biology — Food Research	2,486.09	.....	[1]2,200.00	.....	1,849.27	2,836.82
Ayer Company Research	*599.11	2,817.62	.....	2,839.84	.....	*621.33
Biocinema Research	1,670.57	.....	.....	.....	.....	1,670.57
Alba Research	.....	2,000.00	.....	25.76	.....	1,974.24
Health Education	579.36	1.00	.....	.....	.....	580.36
Special Research	6,784.58	900.00	[2]275.00	2,787.00	275.00	4,897.58
No. 1128	.....	.....	[2]275.00	.....	275.00	.....
Rockefeller Research	*169.09	.....	[2]4,302.00	.....	3,778.53	354.38
Boat House Equipment	1,236.52	353.45	.....	307.12	.....	1,282.85
Building Key Account	2,816.84	1,027.00	.....	857.08	.....	2,986.76
Bus. and Eng. Administration:						
Case Research Account.	.....	500.00	.....	192.11	.....	307.89
Graduate Fellow. Fund	381.20	.....	.....	105.02	.....	276.18
No. 785	111.41	.....	.....	5.46	105.95	.....
J. R. Macomber Fund	35.92	200.00	[2]358.45	594.37	.....	.....
Special No. 1092	.....	.....	[1]300.00	.....	300.00	.....
Carnegie Pension Account	.....	50,533.41	.....	55,233.30	.....	*4,699.89
Chemistry:						
Special No. 1156	.....	.....	[2]425.00	.....	290.78	134.22
Special Res., Gilfillian	200.00	.....	.....	174.93	.....	25.07
Rockefeller Research	4,519.99	.....	[2]6,100.00	.....	5,681.24	4,938.75
Special, No. 1065.	194.75	.....	.....	.....	.....	194.75
Salary Account	446.92	2,525.00	.....	3,008.33	.....	*36.41
Res.Lab.Phys.Chem.Royal.	594.93	.....	.....	.....	.....	594.93
Chem. Eng. Spec. Equip.	.....	.....	[2]1,000.00	.....	.....	1,000.00

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

Schedule R (*Continued*)

Name	*Balance June 29, 1935*	*Income*	*Other Increases or Transfers*	*Expenditures from Income Balances*	*Other Expenditures or Transfers*	*Balance June 30, 1936*
Civil Engineering:						
Soil Mechanics	$531.44	.....	[1]$1,300.00	.....	$1,106.97	$724.47
Spec. No.1056, Cem. Res.	213.66	$75.00	[1]2,000.00	$75.00	199.36	2,014.30
Dept. Pub. Wks. Spec.	.....	1,271.44	.....	1,271.44	.....	.....
River Hydraulic Lab.	.....	.....	300.00	.....	201.03	98.97
No. 913	1,327.76	.....	.....	557.87	.....	769.89
No. 1068	3,768.94	.....	.....	2,646.53	.....	1,122.41
Crafts Library Fund	106.25	700.00	.....	262.26	.....	543.99
Dean's Special Fund	110.27	350.00	.....	250.00	.....	210.27
Dining Service Reserve	.....	.....	.....	3,757.64	.....	*3,757.64
Div. of Indus. Co-operation	.....	99,342.50	.....	99,590.68	.....	*248.18
Dormitory Board, Special	.....	100.00	.....	.....	.....	100.00
Dormitory Com. Account	.....	.....	[2]1,567.03	.....	1,567.03	.....
Electrical Engineering:						
A. E. I. C. Res.	.....	8,500.00	.....	5,576.01	.....	2,923.99
VI-A Fund	151.14	.....	[1]1,000.00	151.14	582.93	417.07
Revision of Curriculum	.....	.....	[1]900.00	.....	900.00	.....
Fog Research — Navy	*7,497.42	12,250.00	[2]1,700.00	9,303.84	.....	*2,851.26
Network Analyzer	2,110.71	1,355.00	[2]92.40	798.21	92.40	2,667.50
Rockefeller Research	469.58	.....	.....	1.45	.....	468.13
Spec. Res.—Timoshenko	630.44	.....	.....	245.67	.....	384.77
Round Hill	*349.99	.....	[1,2]2,347.13	.....	1,868.87	128.27
Carnegie Cosmic Ray	.....	100.00	.....	8.17	.....	91.83
Account 4133	6,361.29	6,000.00	.....	6,119.01	.....	6,242.28
Differential Analyzer	86.00	1,975.00	[1]2,400.00	2,061.00	2,234.44	165.56
Special Res.— Sinclair	2,200.00	.....	.....	2,200.00	.....	.....
High Frequency Research	.....	1,400.00	.....	496.82	.....	903.18
Res. Corp. Dust Pre. Acct.	.....	397.27	.....	600.62	.....	*203.35
Rock. Diff. Anal., No. 1	.....	10,000.00	.....	9,970.49	.....	29.51
Rock. Diff. Anal., No. 2	.....	.....	.....	299.97	.....	*299.97
Rock. Diff. Anal., No. 1182	.....	.....	.....	16.36	.....	*16.36
Rock. Diff. Anal., No. 1178	.....	.....	.....	1,974.95	.....	*1,974.95
Rock. Diff. Anal., No. 1176	.....	.....	[2]5,500.00	.....	2,094.67	3,405.33
Special, No. 1102.	.....	.....	[1]500.00	.....	459.10	40.90
Special, No. 1122.	.....	.....	[1]205.00	.....	82.39	122.61
Emp. Health and Acc. Ins.	.....	4,738.00	.....	4,738.00	.....	.....
Eng. Council for Prof. Dev.	*76.09	963.91	.....	2,082.43	.....	*1,194.61
Engineering Research	1,027.38	.....	[2]500.00	943.34	.....	584.04
Eng. Res. special — Lamar	88.65	.....	.....	.42	.....	88.23
Eng. Res. special — Bitter	500.00	.....	.....	.....	500.00	.....
Eng. Res. special — Wulff	530.00	.....	.....	404.00	.....	126.00
Eng. Res. special — Hardy	200.00	.....	.....	200.00	.....	.....
Eng.Res.special—Moreland	.....	.....	[2]150.00	.....	150.00	.....
Fuels Research Laboratory	3,661.06	.....	.....	531.80	.....	3,129.26
Geological Society 91–34	865.00	.....	.....	865.00	.....	.....
Geology, Rockefeller Res.	2,087.58	.....	[2]3,300.00	.....	2,894.98	2,492.60
No. 913	55.24	83.00	.....	97.54	.....	40.70
Special No. 1096	.....	.....	[1,2]1,250.00	.....	1,250.00	.....
Special No. 1134	.....	.....	[2]400.00	226.43	.....	173.57
Special No. 1060	4,728.29	.....	.....	2,325.60	.....	2,402.69
Found. Mat'l Res.	1,498.40	.....	.....	1,498.40	.....	.....
Graphic Arts Acct.	14.97	.....	.....	.....	.....	14.97
Historic Memorials	356.93	.....	.....	22.75	.....	334.18
High.Volt. Power Proj. Fund (Research Corp.)	*1,992.66	4,456.09	.....	2,211.68	.....	251.75

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

Schedule R (*Continued*)

Name	Balance June 29, 1935	Income	Other Increases or Transfers	Expenditures from Income or Balances	Other Expenditures or Transfers	Balance June 30, 1936
Hygiene Dept. Special . .	†$1,515.71	$10.67	.....	$17.75	.....	$1,508.63
Jour. of Math. and Physics	2,836.59	457.33	.....	2,595.26	.....	698.66
Keyes-Keenan Steam Table	52.71	1,400.00	.....	1,125.16	.....	327.55
Letter Shop	.....	10,140.26	[2]$1,537.64	10,140.26	$1,537.64	.....
Library, Special No. 1 . .	215.82	41.75	.....	75.34	.....	182.23
Build. 6 Equip. Acct. . .	165.17	.....	.....	152.12	13.05	.....
No. 1011	185.68	.....	[1]300.00	185.68	238.52	61.48
No. 1086	300.00	.....	.....	280.75	19.25	.....
Maclaurin Biography . . .	.....	.....	[1]800.00	.....	800.00	.....
Mathematics, No. 1108 . .	.....	.....	[1,2]522.18	.....	522.18	.....
Mechanical Eng., No. 482	485.00	.....	.....	.....	485.00	.....
Heat Engine Research .	.....	9,849.75	.....	2,400.56	.....	7,449.19
Shop Account	.....	.....	[2]490.20	.....	490.20	.....
No. 1069	4,435.64	.....	.....	3,722.94	.....	712.70
Textile Research School	.....	.....	[1]559.57	.....	559.57	.....
Quoddy Project	.....	2,056.00	.....	1,702.08	.....	353.92
Torsiograph Acct. . . .	.....	.....	.....	3,346.99	.....	*3,346.99
No. 1164	.....	.....	[2]721.09	.....	721.09	.....
No. 1143	.....	.....	[1]250.00	.....	250.00	.....
Applied Mech. Journal .	.....	.....	[1]250.00	.....	250.00	.....
Nat. Aero. W., No. 371 .	.....	.....	.....	877.28	.....	*877.28
Nat. Aero. W., No. 372 .	.....	.....	.....	488.30	.....	*488.30
Nat. Aero. W., No. 373 .	.....	.....	.....	366.25	.....	*366.25
Nat. Aero. W., No. 378 .	.....	.....	.....	4.86	.....	*4.86
Navy Vibration Res., No. 2	.....	.....	.....	7,816.84	.....	*7,816.84
Mining Engineering:						
Special, No. 1129. . . .	.....	.....	[2]5,000.00	.....	100.00	4,900.00
Ore Dressing	361.30	36.00	.....	367.32	.....	29.98
Am. Phil. Soc. Research	1,000.00	605.47	[2]493.34	1,605.47	493.34	.....
Special, No. 1103. . . .	.....	.....	[1,2]397.73	.....	397.73	.....
Penrose Fund	245.54	315.81	.....	561.35	.....	.....
Motion Study Course . .	.....	1,000.00	.....	558.13	.....	441.87
Nat. Res. Council — Beattie	500.00	500.00	.....	833.32	.....	166.68
Navy Vibration Res., No. 1	*3,779.28	5,000.00	.....	947.09	[1]273.63	.....
Nuclear Research	324.69	1,250.00	[1,2]14,482.00	4,360.31	[1]13,232.00	*1,535.62
Placement Committee Fund	92.36	.....	[1]300.00	.....	151.97	240.39
Patent Committee Fund .	270.62	.....	[2]4,117.92	270.62	4,117.92	.....
Photographic Service . . .	*150.25	33,325.52	.....	32,217.82	.....	957.45
Physics Department, Special	163.01	.....	.....	125.45	.....	37.56
Am. Phil. Soc. Research	.....	1,000.00	.....	1,133.67	.....	*133.67
Roentgen Ray	1,432.26	.....	.....	500.00	.....	932.26
Hale Spectroscopic Fund	1,486.20	.....	.....	.....	.....	1,486.20
Rockefeller Res. Fund .	1,451.54	.....	[2]6,100.00	881.54	6,100.00	570.00
Perm. Science Fund . .	500.00	.....	.....	.....	.....	500.00
Rockefeller Special Res.	600.00	1,600.00	.....	2,174.61	.....	25.39
Rumford Grant, A. A. of A. & S., No. 1	278.62	.....	.....	.....	.....	278.62
Rumford Grant, Hardy .	203.32	.....	.....	.....	.....	203.32
Rumford Grant, S. . . .	16.37	.....	.....	.....	.....	16.37
Rumford Grant, Harrison	263.70	300.00	.....	441.38	.....	122.32
Rumford Grant, Evans .	.....	300.00	.....	.....	.....	300.00
Summer Spect. Conf. . .	*49.45	.....	[1]1,500.00	1,450.55	.....	.....
No. 916	69.19	.....	.....	.....	.....	69.19
No. 1113	.....	.....	.....	362.27	.....	*362.27

* Overdraft.
[1] Appropriation from Current Income.
[2] By Transfer.
† Exclusive of student notes receivable. (See Schedule P, page 186.)

Schedule R (*Continued*)

Name	*Balance June 29, 1935*	*Income*	*Other Increases or Transfers*	*Expenditures from Income or Balances*	*Other Expenditures or Transfers*	*Balance June 30, 1936*
Physics Department, Special (*Cont.*)						
No. 1066	$694.67	.....	[2]$95.78	$694.67	$95.78	.....
Special Research — Boyce	147.80	$400.00	.....	279.20	.....	$268.60
Special, No. 1149	.....	.....	[2]1,475.00	.....	1,475.00	.....
Suspense — Physics	350.00	.....	.....	.....	350.00	.....
President's Special Fund	10.93	.....	.....	.....	.....	10.93
President's Fund	.....	.....	[1]1,265.75	.....	1,265.75	.....
Register of Former Students	*1,902.02	512.85	[1]1,488.97	.....	99.80	.....
R.O.T.C. Uniform and Subsistence Accounts	736.12	8,264.46	.....	8,487.15	.....	513.43
Research Assoc. of M. I. T.	3,000.00	31,200.00	.....	13,250.51	16,150.00	4,799.49
St. Louis Exhibit Account	.....	.....	[2]380.73	208.62	172.11	.....
Sailing Pavilion	.....	27,588.00	[2]13,113.89	27,588.00	13,113.89	.....
Salaries Reserve Fund	.....	.....	[2]70,705.80	.....	70,705.80	.....
Special, High Sch. Visitors	.....	.....	[1]78.89	.....	78.89	.....
Special, No. 1093 and 1173	.....	.....	[1]1,625.00	.....	1,625.00	.....
Special, Open House	.....	.....	[1]1,376.94	.....	1,376.94	.....
Special, Tech. Movie	.....	.....	58.23	.....	58.23	.....
Special, No. 1095	.....	.....	[2]5,000.00	.....	1,777.76	3,222.24
Special, No. 1096*a*	.....	.....	[1]2,156.40	.....	2,156.40	.....
Special, No. 1161	.....	.....	[1]75.00	.....	75.00	.....
Special, No. 1079 — Hardy	1,051.00	.....	.....	66.00	.....	985.00
Special, No. 1099	.....	.....	[2]2,500.00	488.29	.....	2,011.71
Special, No. 1097	.....	.....	[1]900.00	.....	675.00	225.00
Special, No. 1104	.....	.....	[1]2,900.00	.....	2,476.60	423.40
Special, No. 1114	.....	.....	[1]500.00	.....	500.00	.....
Special, No. 1117 and 1141	.....	.....	[1]204.50	.....	204.50	.....
Special, No. 1123	.....	.....	[2]23,499.18	.....	23,499.18	.....
Special, No. 1127	.....	.....	[1]600.00	.....	600.00	.....
Special, No. 1177	.....	.....	[2]1,000.00	.....	.....	1,000.00
Special, No. 1089—Grading	5,000.00	.....	.....	5,000.00	.....	.....
Special, No. 1096—Alter.	*294.18	.....	[2]294.18	.....	.....	.....
Special, No. 1166	.....	.....	[1]650.00	.....	151.83	498.17
Special, No. 1160	.....	.....	[1]600.00	.....	600.00	.....
Special, No. 1159	.....	.....	[1]549.68	.....	549.68	.....
Special, No. 1147	.....	.....	[1]1,085.00	.....	.....	1,085.00
Special, No. 1145	.....	.....	[2]300.00	197.37	.....	102.63
Special, No. 1135	.....	40.00	[2]2,500.00	40.00	2,500.00	.....
Special — Public Serv. Ad., Summer School	*486.66	.....	[1]1,216.66	.....	730.00	.....
Suspense Accounts	2,940.80	.....	[2]34,714.46	.....	36,515.77	1,139.49
Suspense Account — Special	2,417.70	.....	.....	.....	2,417.70	.....
Tech Loan Fund Committee	.....	.....	[2]124,817.50	.....	124,567.50	250.00
Tech Loan Fund — Interest	2,640.41	.....	[2]16,779.78	.....	16,137.46	3,282.73
Tech Loan Fund — Prin.	22,658.51	.....	[2]89,149.19	.....	81,568.32	30,239.38
Technology Press	1,280.01	500.00	.....	746.12	.....	1,033.89
Textile Found., Special Res.	396.85	1,300.00	.....	1,592.48	.....	104.37
Textile Res. Fund, No. 1081	18.44	.....	.....	18.05	.39	.....
Undergraduate Dues	.....	.....	[1·2]17,375.82	.....	17,273.68	102.14
U. S. Cape Cod Canal Res.	*1,021.22	10,193.93	.....	9,975.25	.....	*802.54
U. S. Navy Torpedo Res.	.....	923.58	[2]1,576.42	923.58	1,576.42	.....
Visual Education Account	*253.80	.....	[1]1,000.00	.....	701.14	45.06
Walker Memorial Library	*37.62	.....	[2]3,290.75	.....	3,006.10	247.03
Water Cooler Research	*263.87	3,049.38	.....	3,025.51	.....	*240.00
Totals	$107,170.93	$383,156.81	$521,018.18	$408,183.76	$493,304.91	$109,857.25
		(Schedule B)		(Schedule C)		(Schedule D)

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

SCHEDULE S

Current Deficit

Deficit, June 29, 1935	$24,951.22
Net Decrease (Schedule A)	8,636.36
Deficit, June 30, 1936 (Schedule D)	$16,314.86

Detail of Profit and Loss Account

Gains and Credits:

Premium Refund Account Employees' Insurance	$2,007.18
Bangor Club House Account	535.99
Appropriation Adjustments and Current Funds Returns	3,433.93
Miscellaneous Credits	556.46
Total Gains	$6,533.56

Losses and Charges:

Students' Accounts (previous years), charged off	$622.41
Expense Lecture Notes	1,734.78
Miscellaneous Charges	154.70
Total Losses	$2,511.89
Net Profit (Schedule A)	$4,021.67

THE ENDOWMENT FUNDS OF THE INSTITUTE

(Alphabetically listed — see listing by groups on pages 180–185 with corresponding reference numbers, showing transactions during the year and balances as of June 30, 1936.)

206 ALBERT FUND, 1930, 1933, 1935, $17,500. Gifts from anonymous donor to pay eight years rental of M. I. T. Student House on Bay State Road, Boston.

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

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

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.

209 BASKET BALL FUND. Excess receipts from Eastern Massachusetts basket ball competitions held for account of M. I. T. A. A. for investment purposes only.

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, 1931–1936, $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 scholarship 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, 1931–36, $580,772. 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, 1927–36, $4,511. 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.

414 CLASS OF 1909 SCHOLARSHIP FUND. Being accumulated through contributions and from proceeds of life insurance policies. Principal to be invested, income available for scholarship aid with preference to direct descendants of members of Class of 1909.

228 CLASS OF 1934 FUND, SPECIAL. Held for investment purposes only.

210, 212, 214, 216, 217, 218, 219, 220, 221, 222, 223. 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, 1931–1936, $209,000. 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.

152 ARTHUR F. ESTABROOK FUND, 1923–36, $98,200. Bequest. $95,000 used for purchase of land and equipment. Balance for general purposes of the Institute.

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, 1925–36, $1,830,000. Bequest. Institute received ten shares of a total of one hundred shares of his residuary estate. Income for general purposes.

278 FRIENDS OF THE LIBRARY, 1936, $220. Contribution for maintenance of and additions to the Institute Library.

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, 1919–25, $93,400. Bequest. Income for assistance of worthy and needy students.

123 ELIOT GRANGER FUND, 1936, $20,000. Bequest under will of Mary Granger in memory of deceased son. Income for the general purposes of the Institute.

525 JOHN A. GRIMMONS FUND, 1930–36, $8,900. 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. Unused balances available for purchase of apparatus and equipment in Department of Electrical Engineering.

154 GEORGE WYMAN HAMILTON FUND, 1935, $54,414.15. Bequest. Principal and income for general purposes of the Institute.

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

259 JAMES HAYWARD FUND, 1866, $18,800. 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.

156 ABBY W. HUNT FUND, 1936, $72,000. Bequest. For general purposes.

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, 1924–35. 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 and other special projects.

124 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, 1924-36, $6,540. Gift and Bequest. 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.

530 LLORA CULVER KRUEGER SCHOLARSHIP FUND, 1936, $5,573.75. Bequest. Both principal and income to be available for needy and worthy students from Schenectady and vicinity.

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.

227 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.

226 M. I. T. ALUMNI ASSOCIATION PERMANENT FUND, 1929–36. Deposited with M. I. T. for investment purposes only.

224 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.

225 M. I. T. TEACHERS' INSURANCE FUND, SPECIAL, 1928–36. 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.

591 HIRAM F. MILLS FUND, 1922, $10,175. 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.

164 CHARLES O. PRESCOTT, 1935, $30,640.78. Principal and income for general purposes of the Institute.

382 PROCTOR FUND, 1929–36. Gift annually from Redfield Proctor for fellowship in Physics.

231 PROFESSORS' FUND, 1931–36. Contributions of one half of outside income earned by members of staff. 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, $34,675. Established by subscriptions of members of Alumni Association through Prof. R. H. Richards for loans to students. By vote of Executive Committee in March 1935, approved by Alumni Council, the income, not now needed for loans, is made available for special scholarship aid in the discretion of the President and Treasurer.

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

326 FRANCES E. ROPER FUND, 1936, $2,000. Bequest. Income for use in Department of Mechanical Engineering.

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

391 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.

488 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, $3,000. 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, 1933–36, $1,000. Annual 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.

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, $4,760. 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, 1915–17, $203,000. 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.

241 UNDERGRADUATE PUBLICATIONS TRUST FUND, 1935, $16,018. Deposited by Alumni Advisory Council on Publications for investment purposes only.

243 UNDERGRADUATE DUES RESERVE FUND, ATHLETICS, 1924–36. Transferred from Undergraduate Dues (current operating account) to secure investment income.

244 UNDERGRADUATE DUES RESERVE FUND, CONTINGENT, 1924–36. Transferred from Undergraduate Dues (current operating account) to secure investment income.

333 WILLIAM LYMAN UNDERWOOD FUND, 1932, $16,252. 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 students preferably from Vermont. Mr. Proctor reserves right to designate recipients 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, [illegible] 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, 1935-36, $169,394. 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, $37,171. 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 WILLMANN 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. Balance of net income available for general purposes of the Institute.

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.

AUDITOR'S CERTIFICATE

We have examined the books and accounts of the Treasurer and the Bursar of the Massachusetts Institute of Technology for the year ended June 30, 1936, and we report upon our verification of the accompanying financial statements of the Treasurer as follows:

We agreed the investment accounts in detail with certified lists of securities held by the Old Colony Trust Company of Boston, Massachusetts, at June 30, 1936, 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 30, 1936, 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.

Our examination embraced also the accounts of the Massachusetts Institute of Technology Pension Association which we found to be correctly stated.

The investment accounts of the Hewett Fund and of the Massachusetts Institute of Technology Pension Association were checked with certified lists of securities held by the Old Colony Trust Company of Boston, Massachusetts, at June 30, 1936.

Respectfully submitted,

PATTERSON, TEELE & DENNIS,
Accountants and Auditors.

1 Federal Street, Boston, September 8, 1936.

REPORT OF THE AUDITING COMMITTEE

The Auditing Committee reports that the firm of Patterson, Teele & Dennis, Accountants and Auditors, was employed to make an audit for the fiscal year ending June 30, 1936, and we submit herewith their certificate dated September 8, 1936.

Their report covers all of the books and accounts of the Treasurer and the Bursar, and of the Hewett Fund, together with the accounts of the Massachusetts Institute of Technology Pension Association.

Respectfully submitted,

HOVEY T. FREEMAN,
WILLIAM R. HEDGE,
HAROLD B. RICHMOND, *Chairman.*

Boston, Mass., September 14, 1936

PERIODICAL PUBLICATIONS, BOOKS AND REVIEWS BY MEMBERS OF THE STAFF

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