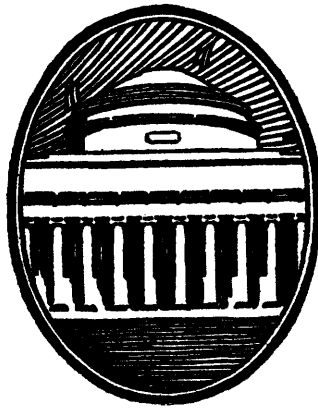


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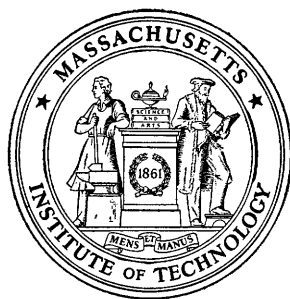
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President's Report Issue

1937-1938

Covering period from meeting of Corporation October, 1937
to meeting of Corporation October, 1938



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1938-1939

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¹ Address correspondence to Massachusetts Institute of Technology.

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FRANK B. JEWETT		
HAROLD B. RICHMOND		

REPORT OF THE PRESIDENT

TO THE MEMBERS OF THE CORPORATION:

It is my pleasure and duty at this time to submit to you a report on the affairs of the Massachusetts Institute of Technology. It carries an optimistic note, for the material and spiritual situation within the Institution has never been more healthy; a decided upturn in business promises well for increased employment of our graduates and improved income from our endowment; and the international skies are clearing. While serious problems still confront our country, I believe that there are more signs of courage and enthusiasm than have been evident for some years. This is an atmosphere which our Institution promotes and in which it should flourish, since it exists for the purpose of building better men and creating better standards of living.

THE YEAR'S OPERATIONS

Personnel. As in other years, I cannot have the pleasure of reporting additions to Corporation and staff membership without the accompanying sorrow of reporting losses. The death of Francis R. Hart on January 18, 1938 marked the end of more than thirty years of devoted and unselfish service to the Institute, during which time he had served almost continuously as either Treasurer or Chairman of the Finance Committee. His interest in the Institute was not confined to financial aspects alone, for we found him ever ready to aid with advice and service in almost every part of our work. Franklin A. Park, Life Member since 1933, died on June 18, 1938. His interest in the Institute was not only effective and devoted, but he also aroused the interest of others, and through his efforts funds have been received for research in several important lines. Chief Justice Arthur P. Rugg of the Supreme Court, who died on June 12, had been a representative of the Commonwealth since 1911.

The Corporation lost through expiration of term memberships, Mr. Halfdan Lee, who had served as Special Term

Member since January 1937; and Messrs. Louis S. Cates and Hovey T. Freeman, Alumni Term Members since 1933 and 1935 respectively.

Our membership has been strengthened by the election of Francis J. Chesterman, Willis R. Whitney and Gordon S. Rentschler as Life Members; Colonel Edward A. Deeds a Special Term Member to fill the unexpired term of Mr. Rentschler, and J. Willard Hayden a Special Term Member for five years. New Alumni Term Members are Messrs. Harry P. Charlesworth, Marshall B. Dalton and Donald G. Robbins. Chief Justice Fred T. Field replaces Mr. Rugg as *ex officio* member.

It is with mingled feelings of pride and regret that I announce the resignation of Dr. Vannevar Bush, Vice-President and Dean of Engineering since 1932. Dr. Bush has been chosen President of the Carnegie Institution of Washington. In his six years of administrative service to the Institution he has made a remarkable contribution to the efficiency of its operation, through assistance to the Executive Committee, clarification of policies, stimulation of creative activity and administration of the affairs of the School of Engineering with a rare combination of critical judgment and inspiring leadership. In the interim period July 1-December 31, Dr. Bush is dividing his time between the two institutions. Professor Edward L. Moreland, Head of the Department of Electrical Engineering, has been appointed Dean of Engineering, while Dr. Bush continues until January 1, 1939 as Vice-President. Professor Edwin S. Burdell, who a year ago was appointed Dean of Humanities, has resigned to accept the important position of Director of Cooper Union in New York. His position remains unfilled during the current year, but it is expected that his successor will shortly be announced to take office a year hence.

The following have retired on account of age: Professors Henry G. Pearson, Head of the Department of English and History, and member of the staff since 1893; William H. Lawrence, member of the staff since 1891, and in charge of the Division of Drawing since 1920; Associate Professors Stephen A. Breed of the Division of Drawing, and Walter H. James of the Department of Mechanical Engineering.

Professor Ross Francis Tucker, in charge of the course in Building Construction since its inauguration in 1926, died December 26, 1937 and Professor Joseph T. Woodruff died December 18, 1937.

The following Emeriti Professors have died during the year: James R. Lambirth, Thomas Smith, John O. Sumner and Harry W. Tyler. Dr. Tyler served the Institute from 1884 until 1930, when he became Professor Emeritus. He was for many years Secretary of the Faculty, Walker Professor of Mathematics and Head of the Department of Mathematics.

Associate Professor Harold L. Hazen has been promoted to the rank of Professor, and appointed Head of the Department of Electrical Engineering; Assistant Professor Howard R. Bartlett has been promoted to the rank of Associate Professor and made Acting Head of the Department of English and History. Professor Walter C. Voss has been given charge of the course in Building and Engineering Construction.

Additional promotions are as follows: To the grade of Professor: James A. Beattie, Tenney L. Davis, Carle R. Hayward, and Carlton E. Tucker; to the grade of Associate Professor: Frederick J. Adams, Joseph C. Boyce, Matthew R. Copithorne, Charles S. Draper, Harold E. Edgerton, Robley D. Evans, Frederick G. Fassett, Jr., Dean M. Fuller, Edwin R. Gilliland, Charles W. MacGregor, Eugene Mirabelli, Heinrich Peters, John T. Rule, Carl L. Svenson and John W. Williams; to the grade of Assistant Professor: Archibald W. Adkins, Walter E. Albertson, Bernard S. Gould, Peter E. Kyle, Douglas M. McGregor, William T. Martin, Lawrence A. Monroe, Charles E. Reed, Donald W. Taylor, Chester M. Van Atta, Lester C. Van Atta, George P. Wadsworth and Archibald Williams.

New appointments to the Faculty are as follows: John E. Burchard, Professor and Director of the newly established Albert Farwell Bemis Foundation; C. Richard Soderberg, Professor of Applied Mechanics; Harold R. Jackson, Associate Professor of Military Science and Tactics; Conrad M. Arensberg, Assistant Professor of Social Anthropology; Douglass V. Brown, Assistant Professor of Industrial Relations; Stanley T. Wray, Assistant Professor of Military Science and Tactics; and George C. Harvey, Assistant Professor of Physics.

Robert L. Shurter of the Case School of Applied Science is serving as exchange Assistant Professor in the Department of English and History. Mr. Sterling Lanier is representing the Institute at the Case School.

Faculty losses through resignations include Associate Professors Jesse Douglas and James C. Ruddell, and Assistant Professors Carl Bridenbaugh, William C. D. Bridges, John E. Eberhardt, Howard S. Gardner, and Robert C. Gunness.

Finances. The accompanying table shows the status and trend of operating income and gifts.

The largest gifts of the year include the \$1,000,000 bequest of Charles Hayden for endowment; the gift of \$647,700 by Godfrey L. Cabot for research on solar energy; \$256,873 received on account of the Alumni Fund; and a bequest of \$102,064 for endowment from the estate of Dr. Francis H. Williams.

Financial Trends

	Operating Income Budget	Total Gifts
1930-31.....	\$2,880,131	\$1,339,280
1931-32.....	3,029,881	1,781,473
1932-33.....	2,779,815	306,295
1933-34.....	2,646,648	208,635
1934-35.....	2,694,799	580,695
1935-36.....	2,714,301	429,533
1936-37.....	2,977,573	812,421
1937-38.....	3,008,530	2,347,693

The market value of the Institute's investments fell from 9 per cent above book value on June 30, 1937 to 1 per cent below on June 30, 1938 when it was \$34,699,656 (book value \$35,072,755). The yield on all investments, based on market value, was 4.45 per cent, compared with 4.63 per cent a year ago. The June 30 portfolio showed 48.7 per cent in bonds; 42 per cent in common stocks; 5.6 per cent in preferred stocks; and 3.7 per cent in mortgages and real estate, all in terms of market value. The principal changes during the year were reductions in government and railroad bond holdings and increase in public utility bonds.

Enrollment. The trend of enrollment is shown in the accompanying table.

The 656 freshmen represent a selection from 1,535 applicants. For the past three years we have tried to stabilize this class at not over 600, which is the Faculty's estimate of the maximum number which can be handled without detriment to the quality of work through overburdening of facilities and staff. To arrive at this number is a difficult procedure because students frequently complete all negotiations for admission but fail to enter when the Institute opens in the fall. Consequently our Admissions Office attempts to discount this shrinkage on the basis of past experience by admitting a certain percentage more than the desired 600. Last spring it was believed that the economic recession, and the increase in tuition from \$500 to \$600, would combine to produce a greater shrinkage than in recent years, and consequently more applicants were accepted beyond the 600 figure. When the actual registration occurred this fall, however, in spite of the economic situation and tuition, a larger proportion of the admitted students actually registered than ever before.

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.....	2,174	650	619	2,793
1937-38.....	2,305	605	661	2,966
1938-39.....	2,401	656	692	3,093

During this year the plan of stabilization has been put partially into effect to limit enrollment in some of the large graduate courses, such as Chemical Engineering and Electrical Engineering, Chemistry and Physics. Here again the maximum enrollment in each course was set at an estimated figure such

that, if it were exceeded, the quality of the educational program would suffer. Had these restrictions not been in effect the total graduate enrollment would have still further exceeded that of any previous year.

The geographical distribution of our students continues in the direction of increasing world-wide representation. During the past year 36 per cent of our students came from Massachusetts; 7 per cent from other New England States; 25 per cent from New York, New Jersey and Pennsylvania; 5 per cent from the South Atlantic States; 3 per cent from the South Central States; 12 per cent from the North Central States; 4 per cent from the Western States; .05 per cent from United States territories and dependencies; 7 per cent from foreign countries. These 216 foreign students came from 37 countries, the largest number being from China, Canada, Cuba, the Philippine Islands, in that order.

Of the students in the Graduate School, 74 per cent had taken their degrees from 139 other colleges in the United States and from 36 colleges in 22 foreign countries.

Student Aid. The following table indicates that more than one-fifth of the money which students pay to the Institute in tuition is received by them in the form of scholarship grants or loans or is earned through contact with the Student Employment Bureau conducted by the Technology Christian Association.

In order to maintain the relative attractiveness of our scholarship and fellowship grants, the funds available for these

Student Aid at M. I. T.

	1936-37		1937-38	
	Number	Amount	Number	Amount
Undergraduate Scholarships.	464	\$74,692	499	\$79,635
Graduate Scholarships				
and Fellowships*	302	90,850	300	109,162
Loans	256	96,699	254	97,363
Student Employment Service	676	77,882	594	74,692
Total Student Aid		\$340,123		\$360,852

* Not including holders of fellowships awarded by other institutions and foundations (30 in 1936-37; 36 in 1937-38) for work at M. I. T.

were increased by approximately the proportion in which the tuition was raised. There was further extension of the recent trend of depending relatively more on the Loan Fund in the upper years and in dividing the scholarship awards into two groups, the one available to freshmen on a competitive basis taking considerable account of financial need, and the other available to upper-class men primarily as prizes for distinctive scholarship.

Physical Plant. The year has witnessed the completion of the following major additions to our physical plant:

The new William Barton Rogers Building, facing Massachusetts Avenue, made possible by the sale of the old Boylston Street property supplemented by an appropriation from the George Eastman Building Fund, was completed this fall and occupied by the School of Architecture and several other branches of the Institute. It was built practically on scheduled time and well within the appropriation, and is a splendid example of able work and fine coöperation between the architects, Welles Bosworth and Harry J. Carlson; the builders, Stone & Webster Engineering Corporation; and our building committee, Messrs. Bush and Ford. Real estate experts have described it as the finest piece of building construction of greater Boston. Reports of its occupants indicate that drafting rooms, offices, classrooms, library and laboratories are all splendidly adapted to their purposes.

The new Graduate House, remodelled from the old Riverbank Court Hotel which was bought through the Finance Committee as an investment, has been completely renovated and refurnished to combine the features of a home and a club for our graduate students. Excellently adapted to this purpose, it was immediately filled with 371 graduate students, and there is a waiting list of 61. Continuing the traditions established during the five years of operation of the first Graduate House, this new one will be under the able direction of Professor Avery Ashdown of the Department of Chemistry who continues as Master of the Graduate House.

The former Graduate House, which occupied the oldest of our dormitory units, has now been converted into a Senior House to give senior students, before graduation, an opportunity to become well acquainted as a group under the same

general auspices which have proved so successful in the operation of the Graduate House. Mr. Walter C. Wood, Sailing Master of the M. I. T. Nautical Association, is Master of the Senior House. Despite the fact that many seniors had already made other arrangements, all but 21 places in this house are occupied by members of the senior class and these are filled by junior and graduate students who have been on the waiting list for other dormitory accommodations.

Thus the dormitories, even with the addition of the new Graduate House, are filled to capacity, and there is a healthy waiting list. I think we can properly say that the dormitory situation is now satisfactory, with the possible exception that we may sometime wish to arrange for married graduate students and junior staff members, though probably not as a dormitory operated by the Institute.

The Wright Brothers Memorial Wind Tunnel was dedicated on September 12 before a distinguished international audience and with Dr. Godfrey L. Cabot presiding. A substantial portion of the cost of the Tunnel was met by contributions from friends of the Institute, of Orville Wright and of aviation, and its design follows the lines recommended three years ago by our Visiting Committee on Aeronautical Engineering. Better than any other wind tunnel in the world, it combines convenience and flexibility over a wide range of operations and it should prove to be one of the most powerful of these essential instruments for aeronautical progress.

Built almost out of sight, behind the spectroscopy laboratory, in one of the enclosed courts, is the new Magnetic Sub-Station. With closely associated laboratories for its use in metallurgy, physical chemistry and spectroscopy, it makes available steady magnetic fields not only several times larger than any hitherto produced, but gives these fields in a sufficiently large volume for relatively large-scale experimentation. This is a significant addition to our already large group of facilities for continuing research programs of unique character, such as the automatic computing center, the high voltage, spectroscopic, cryogenic, wind tunnel, cellulose and other laboratories.

To house the new \$30,000 cyclotron, now under construction through a gift of the John and Mary R. Markle

Foundation, for artificial production of radioactive chemicals to use in medical research in coöperation with neighboring medical institutions, a small laboratory building is being erected north of Vassar Street, adjacent to the high voltage laboratory. We are indebted to Pierre S. du Pont for a recent gift which was partly allocated to this purpose by vote of the Executive Committee.

The total of gifts and pledges from the Alumni Fund campaign was \$402,694.67. This will provide a new track and field house west of Massachusetts Avenue, and on the site of the present old track, an indoor swimming pool with additional facilities as the first units of the desired ultimate gymnasium and auditorium. The new track is being constructed by the Rubien Construction Company, America's most famous track builders, who promise us an unexcelled lay-out for field and track sports, ready for use next spring. Professors Anderson and Beckwith of our School of Architecture have been appointed architects of the field house and gymnasium units. The attractive plans of the field house are in an advanced stage and construction should begin this fall. Construction of the swimming pool unit is scheduled to begin early next spring.

Simultaneously with the occupation of these new buildings there has been completed an extensive reallocation of space throughout the entire group of educational buildings, following the comprehensive plan adopted two years ago. Points of major congestion have been relieved and some small provision has been made for future expansion of those Institute activities which are growing most rapidly. Barring some extraordinary change of conditions, no comparable readjustment of space should be necessary for a number of years.

Taking into account all of these factors, we can safely say that the Institute's physical plant is in the best condition of operating efficiency and of adequate equipment in its history.

ADDITIONS TO PROGRAM

Among many additions to the program of the Institute's activities during the past year, the following are selected for special comment.

The Albert Farwell Bemis Foundation has been estab-

lished at the Institute and endowed from the Albert Farwell Bemis Charitable Trust, by action of Mr. Bemis' heirs. It is devoted to advancement of the art of shelter, through research and dissemination of information on methods and materials of housing. The Director of the Foundation, Professor John E. Burchard, brings to this new enterprise many years of active experience as a student and expert practitioner in this important field. Its staff will cooperate in the teaching programs of the School of Architecture and the course in Building Engineering and Construction, will serve the building industries as a clearing house of reliable information on materials and methods, and, from time to time, will undertake or support research projects in the housing field.

The Industrial Relations Section of the Department of Economics and Social Science has completed its first year of operation in very promising manner, under the able leadership of Professor W. Rupert Maclaurin. The Industrial Relations library is now established in useful working order. The staff have several important investigations under way such as a study of the status of the older worker, in collaboration with the United States Department of Labor, a study of hiring and lay-off policies, in cooperation with one of the leading industrial companies of Massachusetts, and a detailed investigation of industrial relations and economic processes in a selected New England community. The Section has directly served industry during the year by supplying information in reply to some seventy requests from industrial organizations, and has been of direct aid to our staff and students interested in this field. Early in November it will hold its first Industrial Relations Conference, to be participated in by members of the supporting organizations and others by invitation.

Summer Conferences and Courses. Of growing significance are the numerous scientific, technical and industrial conferences which meet at the Institute in rapid succession, bringing leaders in these fields from this country and abroad. Some of these conferences are organized by the Institute, while to others the Institute acts as host or sponsor. The following examples from the past year indicate the wide scope of this activity.

The sixth International Spectroscopy Conference was

attended by 233 conferees from 25 States, Canada and Great Britain, including leading spectroscopists from universities, industry, medical and agricultural institutions. This three-day conference culminated a seven weeks' intensive summer course of lectures and laboratory practice in which 56 were registered.

A fourth special summer course in Colloid Chemistry was given to students, teachers and industrialists from eight States and Canada.

Two special summer courses, each of one week's duration, were held in the subject of Ceramics. One was attended by 18, mostly from research laboratories of the glass companies; of the 23 registrants in the other course, two were members of the faculties of other ceramic schools and most of the rest were from the research staffs of ceramic industries.

A two-day conference on Timber and Concrete was attended by 48 people, with good representation from industrial and governmental groups.

Jointly with the American Planning and Civic Association, the Department of Architecture offered a three weeks' course in City Planning with 12 registrants from six planning agencies and institutions. Associated with it was a special conference with 67 participants.

A six weeks' summer course in Textile Analysis, with a limited registration of 14, drew professors of household economics and industrial technicians, most of whom came from the West and Middle West. The demand for this course was so insistent that it is being repeated this fall more especially for technicians from New England textile mills.

A very successful new conference was held this fall, under joint sponsorship of our Departments of Mathematics and of Economics and Social Science on the subject of Engineering and Industrial Statistics, dealing especially with mass production and quality control. Its 127 registrants included many of the most distinguished statisticians of America and some from England. Insistent demands are coming to the Institute from industrial concerns for professional advice and for graduates trained in this relatively new field.

Last year's initial conference in Food Technology, again of international scope and with an attendance of over 600,

was so successful as to create a demand that it be repeated next year on some different aspect of the food industry. It has already had an important effect in organizing coöperation among food technologists.

In June, the Institute was host to the National Colloid Symposium and in September, jointly with Harvard University, to the International Congress of Applied Mechanics which drew about 300 delegates from 23 countries.

Such meetings enable the Institute to extend its educational influence into the foremost ranks of technology and business. Conversely, they bring both stimulus and prestige to the Institute. I believe that they should be continued and extended in fields where their value is large and where the Institute is particularly well situated to be their sponsor, even though they generally are not fully self-supporting.

SCHOOL OF ARCHITECTURE

There is special interest at this time in the future program of the School of Architecture. Internally, this department has come again into intimate contact with our other departments, after twenty-two years of enforced separation following the transfer to Cambridge of all other departments of Technology. Externally, the architectural profession has been subjected to the simultaneous stresses arising from greatly decreased activity during the depression, technological changes in building methods and materials and new social requirements.

There are indications that these stresses will make considerable changes in architectural practice and therefore also in architectural education, although it is perhaps premature to predict what these changes will be.

Our School of Architecture was the first to be established in the United States and is one of the original departments of the Institute. It ranks second to none in the distinction of its alumni and the extent of its influence on American architecture. The peak of its enrollment was reached just before the depression but since that time its enrollment, relatively to the rest of the Institute, has decreased more than 50 per cent. While this undoubtedly is a reflection of the depression on the architectural profession, it nevertheless presents a problem which

can with advantage be considered simultaneously with the possibilities inherent in the new location of the School. I would therefore direct your thoughts briefly to this situation.

We recognize three related situations which our School of Architecture must face (1) the trends of the architectural profession, (2) our competitive relation to other architectural schools, (3) our decreasing enrollment. Our reaction to these problems must incorporate our judgment regarding the type of architectural education best adapted to the future requirements of architects, estimated with due consideration of the factors inherent in our particular environment.

I have carefully followed discussions in our Visiting Committee meetings and reports of conferences on architectural education elsewhere. I have received, by letter and by word of mouth, many volunteered suggestions. I have sought ideas from many quarters. The answer to our problems would probably be easy if this mass of advice pointed preponderatingly in any given direction, but unfortunately this is not the case. The situation discloses lack of agreement within the architectural profession itself in regard to its future and the best way of preparing for it. The following features, however, appear to me to be fundamental to our situation and to offer a solid foundation for our program.

The central theme of all good architecture is Design, which provides for the efficient functioning of the building in a manner which is artistically pleasing and technically appropriate. Modern development of new building materials and methods, combined with social and economic pressures, is creating new demands on the architect and presenting new opportunities for him. Thus, while the central theme remains unchanged, the techniques of its application must continually adapt themselves to the evolution of the technical and social environment.

Now that the School of Architecture is again a closely integrated part of the Massachusetts Institute of Technology, it has new opportunities to meet the requirements of this situation. While still maintaining continual emphasis on the central importance of design in its program, it now has a wealth of opportunity for students and staff alike to secure instruction, criticism or advice from experts in related fields with which every practicing architect must deal.

Consider for a moment the striking quality of these opportunities. Immediately adjacent to the new quarters of the School of Architecture are located our strong divisions of Building Engineering and Construction, and of Heating, Ventilating and Air Conditioning. Thirty seconds' walk farther along the corridor are the offices of the newly established Bemis Foundation for research on shelter. Near by are located the laboratories of Civil Engineering Structures, Materials Testing and Sanitary Engineering, and the Department of Economics and Social Science, which has given considerable attention to the economics of housing. Going down the corridor in the other direction we come to the headquarters of Public Health Engineering, Acoustical Engineering and Illuminating Engineering.

The importance to architecture of these related activities needs no amplification. I shall only point out that the staff in Building Engineering and Construction specializes in building materials, building methods and construction, and job management, while the Albert Farwell Bemis Foundation was established as a clearing-house for up-to-date information on materials and methods of house construction, and to foster research in these fields.

The opportunities here afforded to the School of Architecture do not flow in one direction only, for conversely, the architectural group can be of continual aid and stimulation to their colleagues in other departments.

It seems clear to me therefore that the great opportunity, which is now open to us as to no other school in the field of architectural education, lies in a course of training which retains the central theme of design and at the same time gives the student some knowledge and some discipline in these related features of a modern structure which are requiring more and more consideration by architects. There should be a great field for young architects who, in addition to competent training in design, have some first-hand knowledge of building materials and construction methods adapted to economy and other practical requirements, even though the technical details may be left to subsidiary specialists.

Accepting the central theme of good architecture as "design which provides for the efficient functioning of the

building in a manner which is artistically pleasing and technically appropriate," I therefore recommend that we proceed to capitalize and coördinate as effectively as possible our existing strong programs in design and in the various technical aspects of construction and equipment of buildings.

I am glad to say that Dean Emerson is not only in agreement with this program, but anticipated my own expression of opinion by himself suggesting the same line of approach. He has already taken some initial steps to make this program effective in our new setting. Also, he has, for some months, been devising a plan whereby our architectural students, in their vacations, may secure practical experience through employment in architects' offices, on construction jobs or in companies which manufacture building materials or equipment. I believe that this effort should continue to be the major concern of our School of Architecture during the next few years.

In speaking of Dean Emerson I would pay sincere tribute to his able and devoted leadership of the School of Architecture during a period in which the above type of coöperation with other departments was practically impossible because of the physical separation of the respective parts of the Institute, and including the recent period in which the effects of depression were more severely felt by architects than by any other one of our professional groups. Early foreseeing the trends, he quickly and energetically set about the establishment of our new course in City Planning. Recognizing that training in design has wider applications than just to buildings, he has successfully directed the attention of many of our students to opportunities in the design of industrial products. He has courageously and generously met problems due to increasing financial difficulties of the students. With his fine spirit reflected in the attitude of his entire staff, I feel confident that the School of Architecture will rebound to greater strength than before, as building activity increases and as we are able to incorporate into our educational program such features as those which I have mentioned above, and doubtless other features, that will give our architectural students a training as well as possible adapted to the artistic, technical, economic and social requirements which the architect of the future will have to face.

EDUCATIONAL PROBLEMS

Every procedure and every curriculum should continually be subjected to search for improvement. In this sense the number of educational problems is equal to the number of educational activities, possible as well as actual. Many of our basic operations have been subject to intensive study and reorganization during the past decade. I will now mention only three problems which, in my judgment, particularly merit attention now. Two of these relate to undergraduate and one to postgraduate education.

A sound basis of procedure, in education as well as in engineering, business or any other affair of life, is to try intelligently conceived experiments and then to develop vigorously in those directions in which the experiments have been successful. In our educational program, two experiments have proved decidedly successful, the Coöperative Courses and the Honors Courses. Should not the scope of their operations therefore be extended?

As Coöperative Courses I include not only our courses thus designated in electrical and in mechanical engineering, but also our Chemical Engineering Practice Schools, which have many similar features, though differing in details. They are decidedly successful from our educational point of view, and they are reported to be attractive to the coöperating companies. It would therefore seem to be a logical next step to attempt the establishment of similar coöperative arrangements in such fields as industrial chemistry, metallurgy, automotive and aeronautical engineering, and any other industrial field in which employment is large enough to make possible the detailing of sizeable groups of students to work in industrial plants under instructional supervision. (Note that I do not advocate for us that type of coöperative education followed in some institutions which consists chiefly of alternating periods of a few weeks each of work and study — a plan which is useful in my judgment only when it is the alternative to no education at all or, perhaps, when dealing with students on the trade school rather than the technological school level.)

Undoubtedly different details of such coöperation would have to be followed to meet the conditions in different types of industries, but the basic requirements of any desirable arrange-

ment should include work at the plants in groups of reasonable class size, under instructional supervision and some adaptation of the work to the students' educational program. Whether the students work for the company for pay (as in our electrical course), or simply have access to the plant for study (as in our chemical engineering course) is of secondary importance.

Moves in this desirable direction of closer educational coöperation between the Institute and industry have recently been made by the Department of Naval Architecture and Marine Engineering in arranging, with aid of our Visiting Committee, for a year of experience at sea for students in the course in Marine Transportation before they enter their final year. The School of Architecture has made some analogous arrangements with near-by city or regional planning agencies and is seeking to provide useful practical experience to its students through summer employment on building jobs or in companies manufacturing building materials or equipment.

I believe that we should seriously explore further such opportunities for advantageous educational coöperation between the Institute and industry.

Our Honors Courses were first tried out in Electrical Engineering. After an evaluation of results, the Faculty extended the opportunity to establish such courses to any other department. Thus far, only one other department, Chemical Engineering, has tried the plan, although Chemistry has put some of its provisions into effect without adopting the name of Honors Course.

The chief features of these courses are: (1) careful selection of students admitted; (2) privilege of unusual freedom from supervision combined with unusual opportunities for consultation with instructors; (3) final comprehensive examinations. In general the plan works well with the best students and not with others; it is more expensive to operate because of the greater individuality of the students' work. Its great assets are its development of initiative and responsibility and its opportunity for progress unrestricted by the slower gait of fellow students.

During the past year the Faculty has begun a reëxamination of the possibility of extending the Honors plan into other departments, and this study will be continued in the present

year. The following facts have emerged from the study thus far:

(1) Many of the features of Honors plans, as in operation in other colleges, are already incorporated in our educational program for all students.

(2) We already have wide latitude in avoiding regimentation or the repression of the most brilliant students. For example, one student recently was awarded both Bachelor's and Doctor's degrees within less than four years after matriculation as a freshman. Many undergraduates take postgraduate studies. Every undergraduate has at least one experience in independent research, his thesis. Our upper-year classes generally have a ratio of number of students to instructors which compares favorably with the tutorial and similar groups in institutions which have adopted such plans. The large proportion of laboratory courses in our curriculum gives unusual opportunity for personal contact between students and instructors.

Despite what we already have in these lines, many of us believe that we can advantageously go still further. For example, I believe that there is a very sound educational basis for comprehensive examinations in the senior and perhaps, less extensively, in the junior years, and preferably with some oral as well as written parts. If we could afford the necessary additional staff and facilities, I should like to see our senior theses made much more significant affairs, for it is the part of the undergraduate experience where the student is definitely on his own responsibility, with no limits except time and ability to what he can accomplish, and where he can realize the thrill that comes from creating knowledge rather than absorbing it. Perhaps along such lines, perhaps only with selected students, we may find ways and means of extending the educational values of the Honors plan.

For graduate students, there would be great benefit from an advanced fellowship fund available to selected graduate students, in the last year of their work for the Doctor's degree, who have previously been earning their graduate school expenses through half-time employment as teaching fellows or assistants. The large part-time assistant, part-time graduate student group includes many of our ablest and most deserving

advanced students. Their teaching or assistant's duties are valuable to them as training and experience, as well as enabling them to pursue advanced study. But this makes a long, hard road to the doctorate, and sacrifices some of the thrill and the efficiency of full-time devotion to study and research in the last year of graduate work.

It is certain that large benefits would come from a group of special graduate fellowships, with stipends of say \$1,000 or \$1,200, awarded annually to the most promising of the part-time teaching fellows or assistants who have come to the stage at which one year of full-time effort should achieve the Doctor's degree. The benefits would include (1) better opportunity for, and performance by these students; (2) partial relief from social pressures, for example the long postponement of marriage, which are so frequently imposed by the necessity of a prolonged educational program; (3) greater attractiveness to our teaching fellowships and assistantships which would enable us to draw a still better selection of these useful young colleagues.

At present we have 89 half-time graduate students who are also serving as teaching fellows or otherwise as half-time assistants. They are already a carefully selected group. We ought to have funds that would enable us to award fellowships for full-time graduate work to perhaps half of these who, after three or four years of part-time service to us have reached the point where a full year of uninterrupted graduate work would probably win the desired degree. To put the plan into effect on this scale would require about \$25,000 annually for fellowships. I know of no other way in which additional funds could be devoted more advantageously to the simultaneous objectives of aiding promising young men and aiding the Institute to do a better educational job.

DESIDERATA

Funds for Research. Having devoted strenuous efforts in the past year to bringing into healthy balance the recreational opportunities for our students, even though these efforts only partially attained their objectives, and having our physical plant now in relatively adequate condition, I would suggest that our thoughts for future improvement follow other channels for

the time being. In addition to the advanced fellowships just mentioned, and to such funds as may aid in promoting the best possibilities of the coöperative and honors plans of undergraduate study, our greatest opportunity for increasing significantly our contributions to human welfare is undoubtedly dependent upon increased funds for research. I have said this same thing on previous occasions. I do not need to defend this viewpoint by answering the criticism that it is ideas and genius primarily, and money only secondarily, which bring values in research. I do not need to argue this, for every one of you has, through Visiting Committee duties, seen part of the vision of what the Institute could accomplish for the benefit of humanity with the ideas and genius already waiting but for the resources to make this vision a reality. We are doing a good deal in such lines now, but we are only scratching the surface of what we might be doing. I probably feel more keenly about this than you do simply because I have had better opportunity to examine the imminent possibilities in this line all through the Institute.

Let me give just one illustration of the many situations with which Dean Bush and I have to struggle literally every day. Two years ago one of our professors came to us with a very interesting and entirely original suggestion for reducing dangers from floods. He had found that some soils may, from organic materials such as come from decaying vegetation, come into such a colloidal condition as to be almost impervious to water. In such condition, rain water will not soak into the soil but will rapidly run off its surface in the manner to produce floods. But he discovered that exceedingly small amounts of cheap chemicals could change the colloidal condition of this soil so that it would let water soak through it freely, which is exactly what is desired to reduce flood hazard and store water in the ground. Being himself swamped with a rapidly increased teaching program, he asked for assistance to secure a large selection of undisturbed samples of soil from some agricultural watershed, such as the Ohio River, and to perform the necessary laboratory tests on these samples. I think you will agree that this is an interesting and novel suggestion in a very important field of human welfare, and the preliminary tests and calculations had shown that the suggestion was not

a wild one. Efforts to secure funds to make these tests have proved unsuccessful.

You may well say to me that surely it should be possible to secure funds for so worthy an enterprise, to which I heartily agree. But the difficulty lies in the fact that this is but one of a hundred opportunities of equal average importance. The result is that we spend most of our efforts in trying to find ways and means for prosecuting these investigations: we succeed in a minority of cases and the rest drag on to haunt us with an ever-increasing memory of lost and vanishing opportunities through enforced negligence.

I wish there were time to let you see some of these situations in detail. We are proud and enthusiastic over those cases in which ways and means have been found for carrying on important projects. But I think that you will understand why I have put a great research fund at the forefront of our major needs, if you expect us to take good advantage of our ever new opportunities to advance human welfare.

Endowed Professorships. A letter from one of our group has called attention to a very surprising peculiarity of the Massachusetts Institute of Technology in that it has not one single endowed professorship. Harvard has 103, Yale 79, Oxford 62, Columbia 58, Cambridge 49, Princeton 36, and Chicago 21, according to a recent compilation by President Hutchins of Chicago. In endowment campaigns of other universities, endowment of professorships has often been found to be the most appealing of all objectives. We have, I think, only two professorships named as memorials and neither of these is endowed. We had made a start toward endowing a professorship to honor our late great colleague, Elihu Thomson, but this was held in abeyance during the depression pending more favorable times. Some of you have expressed the thought that a professorship named for the late President Maclaurin and contributed by alumni who were students during his administration would be the most appropriate memorial to this great builder of the new Institute of Technology.

The least that I can do is to call your attention to this great lack and great opportunity. The least that you can do is to call its attention to others. No more permanently useful gift and memorial is possible in the entire field of education

than a professorship whose influence will be spread and multiplied by the successive generations of students who will be guided and inspired under its auspices.

Gentlemen, I appreciate your interest in this inadequate review of status and needs of the Massachusetts Institute of Technology. The Institute needs your continued active interest and I greatly need your help and counsel. The social value of the Institute's objectives justifies all our combined efforts to carry them forward.

Respectfully submitted,

KARL T. COMPTON, *President.*

REPORTS OF ADMINISTRATIVE OFFICERS

Dean of Students. A continuing trend toward a greater proportion of students from a distance in the entering first-year class; establishment of the "William Barton Rogers Awards" as undergraduate prizes; overthrow of the so-called "Point System" by the Institute Committee; and the beginning of the program for expansion of the opportunities for student recreational life, together with the prospective new Graduate House, are chief among the items worthy of note for the period under review. It is interesting to observe that they relate, respectively, to the four general sections embraced by this Report: stabilization of enrollment, student aid, undergraduate government, and student welfare.

Procedures for the stabilization of enrollment through the selection of a limited number of applicants for admission to the first-year class, and the application of prescribed stabilization ranges for the number of second-year students permitted to continue in each of the several Courses after midyears, were operative for a second year during 1937-38.

Some of the administrative difficulties encountered in estimating how many first-year candidates should be accepted during the spring and early summer months in order that the number actually matriculating might be within the prescribed limits of 575 to 600 were described in last year's Report. After further experience it appears that there may be certain normal "shrinkage" factors which will enable us to estimate the size of the group obliged each year to change plans because of altered financial circumstances, health, or other causes. It is clear, however, that the shift of general economic conditions from year to year introduces a complicating element. For 1936-37, the initial year under limited enrollment, 650 candidates actually registered; for 1937-38 there were 605.

The greater percentage of entering first-year students from a distance under the selected admission plan is shown by the following comparative figures:

	Percentage of First-Year Class		
	1937-38	1936-37	1935-36
From outside New England.....	60.0	51.8	48.6
From outside Massachusetts.....	66.0	59.2	57.0

Based upon a review of its two year's experience with the Course-quota system for second-year students, the Faculty, by unanimous vote, endorsed a continuance of the plan with two important revisions: first in the "timing" of the procedures so that selection for continuance in a Course will take place at the end of the second year rather than at midyears; and second, to set stabilization ranges only for certain Courses rather than for all, *i.e.*, only for Courses "which require a prescribed limitation by reason of space or staff facilities, to avoid anticipated fluctuations in enrollment, and to maintain a satisfactory quality of undergraduate personnel."

The distribution of student aid to undergraduates compared with the previous year is shown below:

	1937-38		1936-37	
	Number	Amount	Number	Amount
Freshman Scholarships.	212	\$42,807	193	\$37,740
Other Undergraduate Scholarships.	287	36,832	270	36,952
Total Scholarships.	499	\$79,639	463	\$74,692
Undergraduate Loans.	254	97,363	256	96,699
Total Aid to Undergraduates	616*	\$177,002	588*	\$171,391
Percentage of Undergraduate Registration Receiving Aid	26.7		27.0	

* Allowing for individuals receiving both scholarship and loan.

Including both graduate and undergraduate students, the Technology Loan Fund Board received 431 applications during 1937-38 and acted favorably upon 318, or 73.8 per cent, \$119,557 being loaned. For 1936-37 the corresponding figures were: 427, 315, 73.8 per cent, and \$118,804.

Repayments to the Fund during 1937-38 were \$98,562 on principal account and \$14,888 for interest, or a total of \$113,450, which came within \$6,118 of providing the \$119,557 loaned.

The cumulative record of the Fund from its establishment in 1930 up to June 30, 1938 (with comparative figures up to June 30, 1937, given in parentheses) shows: that 1,763 (1,611) individuals had borrowed \$1,155,395 (\$1,035,838), the average

amount loaned per capita being \$656 (\$643); and that \$394,317 (\$295,755) had been repaid on principal account, representing 84.4 per cent (80.7 per cent) of the amount due, and \$77,809 (\$62,931) had been paid on interest account.

Of the unpaid \$73,225 due on principal account as of June 30, 1938, interest had been received and extension of principal repayment permitted on all but \$20,466. It is also noteworthy that the \$77,809 received for interest exceeded the total matured principal in arrears, \$73,225.

As an incentive to achievement in scholarship and student activities the "William Barton Rogers Awards" were established during 1937-38 for "members of the Senior Class who, in the opinion of the Faculty Committee on Undergraduate Scholarships, have demonstrated 'outstanding qualities,' weight to be given to non-academic or extra-curricular as well as academic accomplishment, and consideration of financial need to be disregarded." These prizes, of which there were four of \$500 apiece given this year, were made from the income of the William Barton Rogers Fund, subscribed many years ago by members of the Alumni Association for student loans. Its use for the original purpose having been superseded by the Technology Loan Fund, the income of the Rogers Fund has been made available for special scholarship aid at the discretion of the President and Treasurer.

In all, 710 individuals were placed through the Undergraduate Employment Bureau of the Technology Christian Association: 297 under the National Youth Administration program of the Federal Government, 355 in private employment, and 58 under both classifications. Earnings were \$74,692, of which \$24,053 was under the National Youth Administration and \$50,639 through private employment. Compared with the previous year the proportion under the National Youth Administration decreased both in numbers and earnings.

Freshman Camp was conducted for the twelfth year by the Technology Christian Association, the record attendance of 324 first-year men being greater than half the registration of the Class of 1941. The All-Technology Smoker, arranged for all entering students by the Institute Committee, was held for the third year on the evening of registration day for the first term. Open House, an event omitted during 1936-37, was

held on April 30, being conducted by the Institute Committee.

The average scholastic record of 592 men in 20 activity groups was 3.44 in June, 1938, compared with 3.48 for 569 in 20 groups in June, 1937. Fraternity averages also showed little change for 638 men averaged 3.24 in June, 1938, compared with 629 who averaged 3.23 a year ago.

Perhaps the most important trend in student government for some time is indicated in the action of this year's Institute Committee which saw fit to abandon the so-called "Point System"—a plan introduced nearly thirty years ago and maintained without interruption even during the Great War.

Under its operation rating "points" were assigned to the manifold student activity positions, the number for each office being determined by the prestige of the post and the scope of its duties; and no individual was allowed to hold offices totaling more than a specified number of points. Thus the Point System fulfilled a dual objective: the distribution of undergraduate honors, and a division of labor so that an individual might be restrained from overloading himself to the disadvantage of his academic status.

It is true that the number of activities, and consequently the number of posts available, has increased in recent years. It is likewise true that the scholastic averages of men participating in activities are now consistently above the general undergraduate average which is the reverse of the condition some ten years ago. Nevertheless, the Point System amply justified itself without question for the major portion of its history, a remarkably long period when measured in terms of "student generations."

While its value may now be less readily apparent, the natural temptation to elect a popular student to a multiplicity of offices which are, in the aggregate, beyond his capacity is ever present; and there is no evidence that the Institute's academic demands are in process of being reduced.

Moreover, a few men holding many key positions will inevitably lay themselves open to suspicion that they are manipulating the situation to the glory of themselves and their friends. Thus other worthy, though less ambitious, students will be stimulated to remain aloof from participation in activities. Within this group are those who need every possible

encouragement to get out and develop their non-academic qualities for it includes, of course, many undergraduates of the sort often referred to as "grinds" or "brown-baggers," and one of the striking changes in our student system, especially since the War, has been that year by year more and more of these have participated. Not only have such men benefited themselves by their experience, but their presence in increasing numbers in the activity system is a principal reason why the student activities are no longer something which Faculty and Administration observe with tolerance but have come to be regarded as a very essential and important element of the Institute's program.

Hence, it is to be expected that an agitation to revive the Point System by some Institute Committee of the near future is within the realm of possibility.

The outlook for enriching student life during the coming years at this writing appears most promising: a beginning of construction on the program of expanded facilities for recreational purposes; and the addition of places for 350 more residents of our housing system. Both are dealt with in some detail in the President's Report.

From the standpoint of student welfare, even at the possible risk of repetition, the handicap of recreational facilities woefully incommensurate with the standard of our educational equipment justifies emphasis here, and it is to be hoped that means for carrying the entire program to completion in the not too distant future may be found.

The purchase of the Riverbank Court Hotel and its conversion for use as a Graduate House beginning with 1938-39 provides for approximately 165 more advanced students than in the previous Graduate House which now becomes a Senior House. This latter will afford an additional inducement for commuting students to live in the dormitories during their final year and should promote more "class solidarity" prior to graduation. Also, the establishment of a separate Senior House will free space in the other undergraduate halls, thus permitting more entering freshmen to obtain occupancy.

It is especially worthy of note that, in making these plans for enlarging the housing system, the Administration gave consideration to the real estate problems of the fraternities, and

the additional dormitory accommodations, making room for 975 men in all, will but absorb the normal waiting lists for dormitory occupancy during the past several years.

H. E. LOBDELL.

Dean of the Graduate School. The registration of students in the Graduate School maintained its upward trend, being nine greater than a year ago. Including college graduates pursuing courses without reference to higher degrees (special students) the total registration was 646, the highest since the Graduate School was established. The registration for the past five years and the distribution of students in the Schools of Architecture, Science, and Engineering, during the past year are given below:

Registration for the past five years:

	1933	1934	1935	1936	1937
Doctor of Philosophy.....	94	101	90	109	133
Doctor of Science.....	77	88	106	115	128
Doctor of Public Health.....	...	...	1	4	4
Master in Architecture.....	11	16	7	13	11
Master of Science.....	297	266	295	345	320
Master in City Planning.....	...	...	6	9	8
Special Students (Graduate) ...	24	29	31	24	42
Total.....	503	500	536	619	646

Registration by Departments 1937-38:

School of Architecture

Architecture.....	M.Arch.....	11
City Planning.....	M.C.P.....	8
Total.....		19

School of Science

	S.M.	Sc.D.	Ph.D.	Dr.P.H.	Total
Biology and Public Health...	4	..	9	4	17
Chemistry.....	6	1	69	..	76
Geology.....	6	3	11	..	20
Mathematics.....	2	..	11	..	13
Physics.....	7	16	33	..	56
Total.....	25	20	133	4	182

<i>School of Engineering</i>	<i>S.M.</i>	<i>Sc.D.</i>	<i>Total</i>
Aeronautical Engineering.....	22	3	25
Meteorology.....	8	6	14
Business and Engineering Administration..	20	..	20
Chemical Engineering.....	26	53	79
Chemical Engineering Practice.....	34	..	34
Civil Engineering.....	37	6	43
Sanitary Engineering.....	3	..	3
Electrical Engineering.....	35	23	58
Electrical Engineering (Coöperative Course)	32	..	32
Mechanical Engineering.....	32	6	38
Mechanical Engineering (Coöperative Course).....	11	..	11
Mining Engineering.....	5	..	5
Metallurgy.....	5	8	13
Ceramics.....	1	3	4
Naval Construction.....	21	..	21
Economics and Engineering.....	3	..	3
Total.....	295	108	403

A study of the records shows that the number of students registered for the Doctor's degree last year was the largest in the history of the Graduate School, namely, 265 — an increase of 37 over the preceding year. New students entering the Departments in the School of Science and the Department of Chemical Engineering were largely responsible for this increase.

The numerous teaching fellowships now offered in the School of Science are important factors in attracting candidates for the Doctor's degree in this School. These fellowships are in great demand since they afford a means of financing the long period of study necessary to attain the doctorate. It is not anticipated that the number of graduate students in Physics, Chemistry, and Chemical Engineering, will materially increase as the quota established last year by the Committee on Stabilization of Enrollment has already been filled in the Department of Chemistry and has been nearly reached in the other departments. A somewhat larger enrollment in the Departments of Biology, Geology, and Mathematics would be welcome and can be satisfactorily provided for with present research facilities and staff. It is hoped that the opportunities for graduate work now offered in Biochemistry, Biophysics, and the newly equipped Biological Engineering Laboratories, will attract

more students to these fields. In the School of Engineering the only departments which thus far have placed a limit on the registration of their graduate students are Chemical Engineering, Electrical Engineering, and Aeronautical Engineering. The quota for Chemical Engineering was nearly filled.

This year 74 per cent of all students in the Graduate School had taken their Bachelor's degree at other colleges than the Institute as compared with 69 per cent a year ago. The trend in recent years has been more and more in this direction, that is, the growth of the School has been chiefly from students coming to us from other institutions for the advanced training which the facilities of our laboratories and staff offer. One hundred and thirty-nine colleges in the United States, distributed throughout 41 States and the District of Columbia, and 36 colleges in 19 foreign countries were represented by their graduates the past year — an indication of the national and international character of this student group. The following foreign countries were represented:

Australia	England	Siam
British West Indies	France	South Africa
Canada	Germany	Switzerland
China	India	Syria
Colombia	Japan	Tasmania
Cuba	New Zealand	Venezuela
Denmark		

The annual problem of awarding graduate scholarships and fellowships presents new difficulties each year as the number of applicants increases without a corresponding increase in available funds and the quota of students who may be admitted to various departments becomes fixed. In the interest of developing its graduate work each department is naturally desirous of receiving as large an allocation of funds as possible. The Committee on Scholarships is at present making a study of the scholarship problem in the hope that a procedure satisfactory to all departments may be adopted before scholarship awards for 1939-40 are considered. The budget for fellowships and scholarships for the year 1938-39 was \$116,440 of which \$36,830 was appropriated for scholarships to members of the staff pursuing courses leading to higher degrees. To meet the increase in tuition from \$500 to \$600 the Corporation voted a

special scholarship appropriation amounting to 20 per cent of the income available from endowed scholarship funds so that the number of available full-tuition scholarships might not be reduced.

The number of scholarship applications received up to March 1, 1938 was 590. One hundred and forty-nine fellowships and scholarships to full-time students and 111 staff scholarships were awarded, making a total of 260. Forty-four per cent of the applicants thus received awards although a much larger percentage was favorably recommended for scholarship aid by Department Committees on the basis of excellent credentials. Every department thus had a waiting list. Between the date of announcing awards on April 1 and June, 1 scholarships (not including those to members of the staff) amounting to \$15,250 were declined or relinquished after having been previously accepted. The reason offered in many cases was that under existing financial conditions it was impossible to meet the living costs of an academic year even with a full-tuition award. Many of the best students on the waiting list had in the meantime made arrangements to enter other institutions and were therefore lost to our Graduate School. The scholarship contingent fund set up by the Corporation to meet this situation proved inadequate this year in view of the unprecedented number of relinquishments.

Among the fellowships which have been made available this year should be mentioned especially those provided by the Alfred P. Sloan Foundation for post-industrial graduate study in Business Administration, Economics, and Social Science. One hundred and sixty-four applications were received for these fellowships and after a very careful study of credentials and personal interviews, five candidates have been chosen. Other annual fellowships for which the Graduate School is greatly indebted are the following:

The Redfield Proctor Traveling Fellowship
The Sloan Automotive Engineering Fellowship
The duPont Fellowship
The Polymerization Process Corporation Fellowship
The Cellulose Chemistry Fellowships
The Haskins Laboratory Post-Doctorate Fellowship for Research in Electronics

During the past year 36 graduate students came to the Institute under fellowships and scholarships awarded them by other foundations or universities.

The most important development which has taken place during the year affecting the Graduate School has been the acquisition of Riverbank Court Hotel and its transformation into a new Graduate House. Thanks to the untiring efforts during the summer of our Treasurer, Mr. Ford, and House Master, Dr. Ashdown, the building has been completely renovated and furnished as a dormitory and will be ready for occupancy at the beginning of the term. The new Graduate House will accommodate 371 students, or 165 more than the former Graduate House. The space has already been oversubscribed, even before the rooms are ready for occupancy. The arrangement of rooms permits of single, double, and triple suites with bath. The furnishings are very attractive and complete and include, in addition to the usual dormitory equipment, couch, rugs, hangings, lamps, and telephone. On the first floor besides the central lobby is a large lounge facing the river with connecting quiet reading rooms for the Crafts Library. The whole arrangement with adjacent ladies' room lends itself admirably to social gatherings such as the Sunday afternoon teas which have long been a feature of Graduate House. A complete dining room service has been provided so that graduate students may eat together; also the Macomber Room and Fabyan Room, will make it possible to accommodate small dinner gatherings as in the former Graduate House. Provision has been made for a lounge and dining room available to members of the staff which will afford greater opportunity than heretofore for graduate students to meet their instructors socially. In the basement there is an attractive Dutch dining room where Graduate House dinners may be held, and a large room, the buttery, where the students may fraternize evenings. Several rooms for ping-pong and handball, with convenient shower baths, offer facilities for relaxation and recreation within the House.

The new Graduate House with its unsurpassed location overlooking the Charles River Basin, will add much to the pleasure and social life of our graduate students. That the need for enlarged accommodations, urged in last year's report,

should have been so speedily and satisfactorily met is deeply appreciated by everyone interested in the welfare and success of the Graduate School.

H. M. GOODWIN.

The Registrar. The total registration increased again last year, from 2,793 to 2,966, a gain of 173 or 6 per cent. The increases in the three Schools were as follows: Engineering 101, or 5 per cent; Science 34, or 7 per cent; and Architecture 14, or 14 per cent. The division of the total registration among the three Schools was Engineering 79 per cent, Science 17 per cent, and Architecture 4 per cent.

Under the second year of operation of stabilized enrollment the number of new undergraduates was 715, of which 539 entered directly from secondary schools. Table I shows the fluctuations in the number of new undergraduates during the last ten years.

TABLE I
NEW STUDENTS ENTERING THE UNDERGRADUATE SCHOOL

Year	1928-1937			
	New Students from Secondary Schools	College Transfers Entering Undergrad. Years	Total New Undergraduate Students	Total Undergraduate Registration
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
1936-37.....	561	199	760	2,174
1937-38.....	539	176	715	2,305

The graduate student body was the largest in the history of the Institute, and Table II shows the changes during the past decade.

TABLE II
NEW STUDENTS ENTERING THE GRADUATE SCHOOL
1928-1937

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
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
1936-37.	67	8	233	308	619
1937-38.	68	18	219	305	661

The statistics for the year 1937-38 follow.

J. C. MacKINNON.

All statistics on registration are as of November 1, 1937

All statistics on degrees are through June, 1938

TABLE 1
THE CORPS OF INSTRUCTORS

	'25	'26	'27	'28	'29	'30	'31	'32	'33	'34	'35	'36	'37
Faculty Members of the Staff	179	185	199	215	220	240	253	242	235	245	245	244	267
Professors	63	68	73	82	81	86	98	93	88	83	87	78	87
Associate Professors	49	55	58	61	59	63	68	60	57	69	81	87	89
Assistant Professors	53	51	58	64	71	80	79	81	80	82	68	70	76
Ex-Officio	—	—	—	—	2	4	3	5	5	6	6	6	5
Instructors	14	11	10	8	7	7	5	5	5	6	3	3	3
Research Associates	—	—	—	—	—	—	—	—	—	—	—	—	7
Other Members of the Staff	236	264	268	272	295	323	335	283	263	272	284	291	331
Instructors	112	116	115	119	116	123	133	105	90	86	90	97	101
Teaching Fellows	—	—	—	—	—	—	—	21	22	20	24	51	52
Assistants	53	63	55	53	68	70	96	45	43	70	76	64	69
Technical Assistants	—	—	—	—	—	—	—	28	31	28	—	—	—
Lecturers	21	23	30	29	32	32	34	28	25	25	24	19	29
Research Associates	21	24	29	22	21	31	31	32	26	22	27	31	22
Research Assistants	29	38	39	49	58	65	36	20	21	18	30	24	42
Research Fellows (D.I.C.)	—	—	—	—	—	2	5	3	2	1	—	—	—
Research Fellows	—	—	—	—	—	—	—	—	3	1	12	5	16
Special Investigator	—	—	—	—	—	—	—	1	—	—	—	—	—
Total	415	449	467	487	515	563	588	525	498	517	529	535	598
Other Members of the Faculty	17	14	13	11	14	15	15	17	25	26	27	31	28
Professors: Emeriti	7	6	6	4	4	6	7	13	21	23	24	29	27
Retired	7	5	4	3	4	3	3	—	—	—	—	—	—
Non-Resident	3	3	3	4	6	6	5	4	4	3	3	2	1

TABLE 2
REGISTRATION SINCE THE FOUNDATION OF THE INSTITUTE

Year	Number of Students	Year	Number of Students	Year	Number of Students
1865-66	72	1890-91	937	1915-16	1,900
1866-67	137	1891-92	1,011	1916-17	1,957
1867-68	167	1892-93	1,060	1917-18	1,698
1868-69	172	1893-94	1,157	1918-19	1,819
1869-70	206	1894-95	1,183	1919-20	3,078
1870-71	224	1895-96	1,187	1920-21	3,436
1871-72	261	1896-97	1,198	1921-22	3,505
1872-73	348	1897-98	1,198	1922-23	3,180
1873-74	276	1898-99	1,171	1923-24	2,949
1874-75	248	1899-00	1,178	1924-25	2,938
1875-76	255	1900-01	1,277	1925-26	2,813
1876-77	215	1901-02	1,415	1926-27	2,671
1877-78	194	1902-03	1,608	1927-28	2,712
1878-79	188	1903-04	1,528	1928-29	2,868
1879-80	203	1904-05	1,561	1929-30	3,066
1880-81	253	1905-06	1,466	1930-31	3,209
1881-82	302	1906-07	1,397	1931-32	3,188
1882-83	368	1907-08	1,415	1932-33	2,831
1883-84	443	1908-09	1,461	1933-34	2,606
1884-85	579	1909-10	1,479	1934-35	2,507
1885-86	609	1910-11	1,506	1935-36	2,540
1886-87	637	1911-12	1,559	1936-37	2,793
1887-88	720	1912-13	1,611	1937-38	2,966
1888-89	827	1913-14	1,685		
1889-90	909	1914-15	1,816		

TABLE 3
CLASSIFICATION OF STUDENTS BY COURSES AND YEARS

Course Name and Number	1935-36							1936-37							1937-38						
	YEAR							YEAR							YEAR						
	1	2	3	4	G	Total		1	2	3	4	G	Total		1	2	3	4	G	Total	
Aeronautical Engineering XVI	76	27	28	29	40	200		86	28	28	32	30	204		71	28	32	28	32	191	
Meteorology (in Aero. Eng. Department)																					
Architectural Engineering IV-A	5	3	4	2	17	39		5	1	3	3	17	19				1	4	4	19	
Architecture IV, IV-B, IV-C	13	19	17	21		21		16	15	16	15	22	82		17	16	19	17	21	90	
Architecture (IV, IV-B, IV-C) Fifth Year																					
Biology and Public Health VII	13	14	9	16	13	65		16	15	17	19	24	91		6	19	22	19	22	88	
Biophysics and Biological Engineering VII-A															2	2	1	2	5	6	
Building Engineering and Construction XVII	8	6	4	14		32		4	11	4	4		23		6	4	12	53	24	27	
Business and Engineering Administration XV	58	69	63	71	19	280		65	67	60	64	18	274		56	79	57	53	87	260	
Chemical Engineering X	112	78	56	46	56	348		133	80	73	45	390		124	94	66	62	62	37	433	
Chemical Engineering Practice X-A, X-B																					
Chemistry V	30	22	14	19	55	140		37	31	19	12	77	176		32	32	25	21	76	186	
Civil Engineering I	36	23	25	24	34	142		26	29	27	15	11	122		25	12	25	25	36	123	
Economics and Engineering or Science						2						7							15	15	
Electrical Engineering VI, VI-B, VI-C	55	45	42	49	57	248		65	39	55	41	65	265		73	39	55	41	68	276	
Electrical Engineering (Coöperative) VI-A	28	32	32	20	18	133		42	49	24	33	31	179		28	50	38	28	32	176	
Electrochemical Engineering XIV	7	11	14	29	6	61		7	5	9	13	20	47		4	16	17	27	64		
General Engineering IX-B	3	2	3	4		12		5	4	6	5		20			9	8		25		
General Science IX-A																					
Geology XII	3	—	1	2	9	15		3	6	1	1	15	26		1	4	3	2	22	32	
Marine Transportation XIII-C		3	4	7	—	18		5	7	2	5		19		6	8	6	5	25		
Mathematics XVIII	3	5	3	9	6	26		4	1	3	2	10	20		3	6	3	13	27		
Mechanical Engineering II	62	72	41	49	40	264		70	78	55	41	46	290		85	108	62	49	35	339	
Army Ordnance (in Mech. Eng. Department)						10						10	10						12	12	
Torpedo Engineering (in Mech. Eng. Dept.)																					
Mechanical Engineering (Coöperative) II-A			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-B			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-C			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-D			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-E			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-F			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-G			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-H			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-I			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-J			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-K			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-L			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-M			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-N			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-O			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-P			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-Q			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-R			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-S			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-T			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-U			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-V			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-W			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-X			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-Y			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-Z			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AA			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AB			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AC			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AD			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AE			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AF			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AG			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AH			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AI			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AJ			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AK			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AL			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AM			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AN			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AO			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AP			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AQ			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AR			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AS			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AT			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AU			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AV			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AW			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AX			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AY			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-AZ			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BA			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BB			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BC			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BD			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BE			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BF			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BG			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BH			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BI			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BJ			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BK			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BL			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BM			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BN			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BO			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BP			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BQ			10			10						2	2						2		
Mechanical Engineering (Coöperative) II-BR			10			10</															

TABLE 4-A
CLASSIFICATION OF STUDENTS BY COURSES, OPTIONS, AND YEARS

COURSE			YEAR										TOTAL	COURSE NUMBER
NO.	NAME	OPTION	1		2		3		4		GRAD.			
			Opt.	Tot.	Opt.	Tot.	Opt.	Tot.	Opt.	Tot.	Opt.	Tot.		
I	Civil Engineering	Army Engineer	25	25	12	12	25	25	25	25	36	51	138	I
II	Mechanical Eng.	1. General	—	—	—	—	—	—	—	—	15	—	353	II
		2. Automotive	—	—	—	—	—	—	—	—	—	—		
		3. Refrig. and Air Condition.	—	—	—	—	—	—	—	—	—	—		
		4. Materials and Design	—	—	—	—	—	—	—	—	—	—		
		5. Textile	—	—	—	—	—	—	—	—	—	—		
II-A	Mechanical Engineering	Army Ordnance	—	—	—	—	—	—	—	—	—	—	29	II-A
III	Mining Eng.	1. Mining	1	7	5	9	5	5	7	5	6	11	35	III
		2. Petroleum Production	2	1	4	4	2	16	19	—	—	13	100	IV
IV	Architecture	Fifth Year	—	—	—	—	—	—	—	—	—	—	5	IV-A
IV-B	Architectural Engineering	—	—	—	—	—	—	—	—	—	—	—	9	IV-B
IV-C	City Planning	—	—	—	—	—	—	—	—	—	—	—	2	IV-C
V	Chemistry	—	—	—	—	—	—	—	—	—	—	—	186	V
		—	—	—	—	—	—	—	—	—	—	—		
		—	—	—	—	—	—	—	—	—	—	—		
		—	—	—	—	—	—	—	—	—	—	—		
		—	—	—	—	—	—	—	—	—	—	—		
VI	Electrical Engineering	Cooperative	—	—	—	—	—	—	—	—	—	—	68	VI-A
VI-B	Electrical Engineering	Illuminating	—	—	—	—	—	—	—	—	—	—	176	VI-B
VI-C	Electrical Engineering	Communications	—	—	—	—	—	—	—	—	—	—	13	VI-C
VII	Biology and Public Health	1a. Biology	—	—	—	—	—	—	—	—	—	—	88	VII
		1b. Biology	—	—	—	—	—	—	—	—	—	—		
VII-A	Biophysics and Biological Engineering	2. Industrial Biology	5	11	3	13	11	11	11	11	17	22	6	VII-A
VIII	Physics	3. Public Health Eng.	6	19	3	19	22	22	22	22	19	—	137	VIII
IX-A	General Science	1. General	2	2	8	23	17	17	17	11	2	59	25	IX-A
IX-B	General Engineering	2. Applied	9	18	15	9	9	8	8	8	8	—	64	IX-B
X	Chemical Engineering	—	—	—	—	—	—	—	—	—	—	—	433	X
X-A	Chemical Engineering Practice	Graduate	—	—	—	—	—	—	—	—	—	—	37	X-A
X-B	Chemical Engineering Practice	Undergraduate	—	—	—	—	—	—	—	—	—	—	3	X-B
XI	Sanitary Engineering	—	—	—	—	—	—	—	—	—	—	—	6	XI

(Continued on page 46)

TABLE 4-A (Continued)
CLASSIFICATION OF STUDENTS BY COURSES, OPTIONS, AND YEARS

COURSE			YEAR												TOTAL	COURSE NUMBER
NO.	NAME	OPTION	1		2		3		4		GRAD.					
			Op- tion	Tot.	Op- tion	Tot.	Op- tion	Tot.	Op- tion	Tot.	Opt.	Tot.				
XII	Geology	1. General Geology & Strat. 2. Physical & Econ. Geology 3. Mineralogy 4. Geophysics	1 1 2 4	1 1 19 —	1 1 2 —	4 — 22 —	3 — 15 8	3 — 6 6	1 1 — —	2 — 19 8	— — — —	22 — 7 1	32	XII		
XIII	Naval Architecture and Marine Engineering		—	—	—	—	—	—	—	—	—	—	75	XIII		
XIII-A	Naval Construction		—	—	—	—	—	—	—	—	—	—	21	XIII-A		
XIII-C	Marine Transportation		—	—	—	—	—	—	—	—	—	—	25	XIII-C		
XIV	Electrochemical Engineering		—	—	—	—	—	—	—	—	—	—	22	XIV		
XV	Business and Eng. Admin.	1. Physical Sciences 2. Chemical Sciences	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	24	XV		
XVI	Aeronautical Engineering — Meteorology		41 15	56 71	45 34	79 28	36 21	57 32	41 12	53 28	— 19	24	269	XVI		
XVII	Building Engineering and Construction		—	—	—	—	—	—	—	—	—	51	210	XVII		
XVIII	Mathematics		—	—	—	—	—	—	—	—	—	—	27	XVIII		
XIX	Metallurgy		14	14	23	23	18	18	11	11	13	18	84	XIX		
	Economics & Eng. or Sci — Engineering		—	—	—	—	—	—	—	—	—	3	3	Ec. & Eng. or Sc.		
	Unclassified		—	—	—	—	—	—	—	—	—	—	63	Unc		
Total			605	605	620	620	577	577	503*	503*	661	661	2,966	Total		

* This total includes fifth year in Architecture, City Planning, and City Planning Practice.

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		
I Civil Engineering	Aero. Meteor.	—	—	1	1	7	9	I
II Mechanical Engineering		—	1	—	2	8	11	II
IV Architecture		—	1	2	4	2	11	IV
Fifth Year		—	—	—	2	—		
V Chemistry		1	1	—	4	—	6	V
VI Electrical Engineering		—	—	—	1	9	10	VI
VI-C Electrical Engineering (Communications)		—	—	—	1	—	1	VI-C
VII Biology and Public Health		1	—	10	11	2	24	VII
VIII Physics		—	—	—	1	4	5	VIII
X Chemical Engineering		—	—	1	—	3	4	X
XII Geology		—	—	—	—	1	1	XII
XIII Naval Architecture & Marine Engineering		—	—	1	—	—	1	XIII
XIII-C Marine Transportation		1	—	—	—	—	1	XIII-C
XV Business and Engineering Administration		—	—	—	1	1	2	XV
XVI Aeronautical Engineering		—	—	—	1	2	8	XVI
		—	—	—	—	5		
XVII Building Engineering and Construction		—	—	—	1	—	1	XVII
XIX Metallurgy		—	2	—	—	—	2	XIX
Unclassified		—	2	1	1	—	4	Unc.
Total		3	7	16	31*	44	101	

* 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	2	—	1	—	1	3	5	I
II Mechanical Engineering		2	1	6	3	3	15	II
III Mining Engineering		1	—	—	—	—	1	III
IV Architecture		1	—	—	—	1	5	IV
Fifth Year		—	—	—	3	—		
V Chemistry		—	1	—	—	7	8	V
VI Electrical Engineering		1	1	1	1	4	8	VI
VI-A Electrical Engineering (Coöperative)		—	—	1	—	1	2	VI-A
VI-C Electrical Engineering (Communications)		—	—	1	—	—	1	VI-C
VII Biology and Public Health		—	3	—	—	3	6	VII
VIII Physics		—	1	—	—	3	4	VIII
IX-A General Science		—	—	—	1	—	1	IX-A
IX-B General Engineering		—	—	—	2	—	2	IX-B
X Chemical Engineering		1	2	1	3	5	12	X
XII Geology		—	—	—	—	1	1	XII
XIII Naval Architecture & Marine Engineering		—	—	1	1	—	2	XIII
XIII-C Marine Transportation		—	—	—	1	—	1	XIII-C
XIV Electrochemical Engineering		—	1	—	—	—	1	XIV
XV Business and Engineering Administration		2	3	2	2	7	16	XV
XVI Aeronautical Engineering		2	1	1	—	3	9	XVI
		—	—	—	—	2		
XVII Building Engineering and Construction		—	—	1	—	—	1	XVII
XVIII Mathematics		—	—	1	1	—	2	XVIII
XIX Metallurgy		1	—	—	1	2	5	XIX
Ceramics		—	—	—	—	1		
Unclassified		—	2	6	1	—	9	Unc.
Total		11	17	22	21*	46	117	

† Excluding seven special students.

* This total includes Fifth Year in Architecture.

TABLE 5
CLASSIFICATION OF STUDENTS BY COURSES SINCE 1930

Engineering Courses	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38
<i>Total</i>	2,564	2,495	2,197	2,008	1,961	2,028	2,187	2,288
Aeronautical Engineering XVI	233	193	193	162	183	200	221	210
Architectural Engineering IV-A	72	53	34	31	23	17	12	5
Building Engineering and Construction XVII	82	67	34	32	31	32	23	27
Business and Engineering Administration XV	347	378	371	343	305	280	274	269
Chemical Engineering X, X-A, X-B	404	378	371	323	356	414	452	473
Civil Engineering I, I-A	236	224	175	142	129	142	122	123
Army Engineer (in Civil Engineering Department)							11	15
Electrical Engineering VI, VI-A, VI-B, VI-C	523	502	443	395	380	381	444	452
Electrochemical Engineering XIV	31	45	42	35	38	27	23	22
Fuel and Gas Engineering	11	9						
General Engineering IX-B	46	43	32	35	52	61	47	64
Mechanical Engineering II, II-A	369	344	315	270	255	274	313	370
Army Ordnance (in Mechanical Engineering Department)	11	10	11	9	9	10	10	12
Metallurgy XIX	50	70	58	65	50	60	81	84
Mining Engineering III	48	44	36	35	32	28	32	35
Naval Architecture and Marine Eng. XIII, XIII-C	71	89	93	90	90	80	93	100
Naval Construction XIII-A	15	20	34	26	25	23	23	21
Sanitary Engineering XI	13	12	11	13	12	9	6	6
<i>Science Courses</i>	378	439	439	439	405	382	467	501
Biology and Public Health VII, VII-A								
Chemistry V	99	100	94	92	81	65	91	94
General Science IX-A	146	158	146	145	137	140	176	186
Geology XII	9	4	10	12	10	12	20	25
Mathematics XVIII	17	20	20	21	16	15	26	32
Physics VIII	29	32	31	28	35	26	20	27
	78	125	138	141	126	124	134	137
<i>Architecture IV, IV-B, IV-C</i>								
<i>Total</i>	200	190	159	135	120	100	97	111
<i>Economics and Engineering or Science</i>								
<i>Unclassified</i>	56	54	25	15	12	2	7	3
<i>Grand Total</i>	3,209	3,188	2,831	2,606	2,507	2,540	2,793	2,966

TABLE 6
GEOGRAPHICAL CLASSIFICATION OF STUDENTS SINCE 1933

UNITED STATES	1933	1934	1935	1936	1937
<i>North Atlantic</i> Total	2,050	1,919	1,877	1,979	2,026
Connecticut	69	76	92	109	113
Maine	38	37	28	33	26
Massachusetts	1,264	1,148	1,088	1,092	1,077
New Hampshire	37	33	23	21	23
New Jersey	122	136	143	154	169
New York	337	326	361	400	432
Pennsylvania	119	110	104	127	142
Rhode Island	49	36	29	30	35
Vermont	15	17	9	13	9
<i>South Atlantic</i> Total	94	82	106	139	139
Delaware	4	4	7	12	14
District of Columbia	35	32	36	34	32
Florida	3	3	7	10	13
Georgia	1	2	7	10	6
Maryland	14	19	20	23	29
North Carolina	7	5	7	11	8
South Carolina	3	2	3	3	2
Virginia	24	12	12	26	24
West Virginia	3	3	7	10	11
<i>South Central</i> Total	45	51	51	70	94
Alabama	4	2	3	6	12
Arkansas	2	2	1	3	3
Kentucky	7	9	14	13	12
Louisiana	7	9	8	13	14
Mississippi	2	2	2	5	5
Tennessee	8	7	7	7	10
Texas	15	20	16	23	38
<i>North Central</i> Total	226	238	262	293	350
Illinois	54	66	76	91	106
Indiana	10	12	16	12	14
Iowa	6	7	8	6	8
Kansas	7	6	6	7	10
Michigan	19	21	18	26	34
Minnesota	18	17	15	19	18
Missouri	34	33	39	35	41
Nebraska	5	4	4	3	5
North Dakota	4	1	5	4	4
Ohio	55	52	58	73	95
South Dakota	—	1	3	1	1
Wisconsin	14	18	14	16	14
<i>Western</i> Total	74	90	101	119	129
Arizona	2	2	2	2	3
California	24	32	38	44	46
Colorado	11	15	23	25	26
Idaho	2	1	—	2	2
Montana	3	3	—	8	6
Nevada	—	—	—	1	2
New Mexico	4	4	6	4	5
Oklahoma	7	6	5	6	6
Oregon	6	8	6	5	7
Utah	4	1	4	4	6
Washington	11	18	16	16	19
Wyoming	—	—	1	2	1
<i>Territories and Dependencies</i> Total	8	5	4	12	12
Alaska	—	—	—	—	—
Canal Zone	1	—	—	2	1
Hawaii	4	3	1	4	6
Puerto Rico	2	2	3	6	5
Total for United States	2,497	2,385	2,401	2,612	2,750

TABLE 6 (Continued)

FOREIGN COUNTRIES	1933	1934	1935	1936	1937
Total	109	122	139	181	216
Argentina	1	3	5	7	2
Australia	1	—	2	2	2
Austria	1	3	2	1	1
Belgium	1	2	2	1	—
Bermuda	1	1	—	—	—
Brazil	—	2	1	2	1
British West Indies	1	2	—	—	1
Canada	31	24	29	30	37
Chile	1	1	—	—	—
China	12	28	35	50	57
Colombia	5	3	1	2	6
Cuba	8	7	12	11	14
Denmark	—	—	1	—	1
Dominican Republic	—	—	—	—	1
Ecuador	—	1	—	—	—
England	3	3	6	11	8
France	2	2	1	4	5
Germany	2	2	1	3	2
Guatemala	—	—	1	1	1
Haiti	—	—	—	—	2
Honduras	—	—	2	2	1
Hungary	—	—	—	1	—
India	3	6	6	11	8
Iraq	1	2	2	—	1
Ireland	1	1	1	1	—
Italy	—	1	—	—	2
Japan	3	7	5	4	2
Java	1	—	—	—	—
Manchukuo	2	—	—	—	—
Mexico	5	5	4	5	7
Netherland Indies	—	1	1	1	1
Netherlands	—	1	1	2	4
Newfoundland	—	1	—	—	1
New Zealand	—	—	—	1	2
Norway	3	1	1	2	2
Palestine	1	—	—	—	—
Panama	1	2	1	1	—
Persia	—	—	1	—	—
Peru	—	—	—	1	1
Philippine Islands	1	—	—	8	13
Poland	1	—	1	—	—
Salvador	1	—	—	—	—
Scotland	—	—	1	1	—
Siam	1	1	1	4	9
Spain	1	—	—	—	1
Sweden	2	—	1	—	1
Switzerland	1	3	1	3	3
Syria	—	1	1	1	2
Turkey	—	1	2	4	6
Union of South Africa	2	2	4	3	5
Union Socialistic Soviet Republic	8	1	1	—	—
Venezuela	1	1	2	—	3
Grand Total, United States and Foreign	2,606	2,507	2,540	2,793	2,966

TABLE 7
WOMEN STUDENTS CLASSIFIED BY COURSES AND YEARS

COURSE	YEAR					Total
	1	2	3	4	G	
I Civil Engineering	—	—	—	—	1	1
IV Architecture	5	2	4	2	—	} 15
Fifth Year	—	—	—	2	—	
IV-B City Planning	—	—	—	—	1	1
IV-C City Planning Practice	—	—	—	—	—	} 1
Fifth Year	—	—	—	1	—	
V Chemistry	1	2	1	2	4	10
VII Biology and Public Health	3	2	2	—	3	10
VIII Physics	1	1	—	1	1	4
IX-A General Science	—	—	2	—	—	2
IX-B General Engineering	—	1	—	—	—	1
X Chemical Engineering	1	—	—	—	—	1
XV Business and Engineering	—	—	—	—	—	—
Administration	—	2	—	—	—	2
XVI Aeronautical Engineering	—	—	—	—	1	1
XVIII Mathematics	—	1	—	—	2	3
Unclassified	—	2	—	—	—	2
Total	11	13	9	8*	13	54

* This total includes Fifth Year in Architecture and City Planning Practice.

TABLE 8
OLD AND NEW STUDENTS

Year	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38
Students registered at end of last academic year (including specials)	1,866	1,748	1,568	1,558	1,634	1,843
Students who have previously attended the Institute, but were not registered at end of last academic year (including specials)	126	120	124	91	110	124
New students who entered by examination	403	241	214	194	190	162
New students who entered without examination	89	187	253	287	371	377
New students who entered from other colleges as candidates for degrees	289	266	302	361	432	395
New students (specials, not candidates for degrees)	58	44	46	49	56	65
Total	2,831	2,606	2,507	2,540	2,793	2,966

TABLE 9
LIST OF AMERICAN COLLEGES AND UNIVERSITIES, WITH NUMBER OF GRADUATES
ATTENDING THE INSTITUTE

<i>College</i>		<i>College</i>		<i>College</i>	
Adrian College	1	Mass. State College	2	University of Buffalo	1
Alabama Polytechnic Inst.	3	Miami University	2	University of California	7
Albion College	1	Mich. State College	1	University of Chicago	5
Allegheny College	1	Mississippi State College	2	University of Cincinnati	1
Alma College	1	Missouri Valley College	1	University of Colorado	3
Amherst College	7	Montana School of Mines	1	University of Delaware	2
Armour Institute of Tech.	3	Montana State Univ.	1	University of Denver	6
Bates College	6	Mt. Holyoke College	1	University of Florida	1
Beloit College	1	Muskingum College	1	University of Illinois	7
Berea College	1	Newark College of Eng.	1	University of Kansas	3
Boston College	4	Nebraska Wesleyan Univ.	1	University of Kentucky	5
Boston Teachers' College	1	N. Y. State Coll. for Teach.	1	University of Louisville	1
Boston University	1	New York University	3	University of Maine	5
Bowdoin College	5	N. C. State College of		University of Maryland	2
Brigham Young Univ.	1	Agriculture and Eng.	1	University of Michigan	4
Brooklyn College	2	N. Dak. Agric. Coll.	1	University of Minnesota	6
Brown University	4	Northeastern University	4	University of Nebraska	1
California Inst. of Tech.	4	Oberlin College	7	University of Nevada	1
Carleton College	1	Ohio State University	3	Univ. of New Hampshire	4
Carnegie Inst. of Tech.	1	Ohio University	1	Univ. of North Carolina	4
Case School of App. Sci.	2	Oregon Inst. of Tech.	1	University of Notre Dame	2
Catholic Univ. of America	1	Oregon State Agric. Coll.	2	University of Oklahoma	3
Central College (Mo.)	1	Pennsylvania State Coll.	6	University of Oregon	1
Coe College	1	Pomona College	6	Univ. of Pennsylvania	9
Colby College	1	Pratt Institute	1	Univ. of Pittsburgh	2
College of City of N. Y.	9	Princeton University	4	University of Redlands	1
College of Wooster	1	Purdue University	6	University of Richmond	1
Colorado College	1	Radcliffe College	2	University of Rochester	3
Colorado School of Mines	1	Randolph-Macon College		Univ. of Santo Tomas	1
Columbia Univ. (N. Y.)	5	for Men	2	Univ. of Southern Calif.	1
Connecticut Agric. Coll.	1	Rensselaer Poly. Inst.	1	University of Tennessee	4
Cooper Union	1	Rhode Island State Coll.	2	University of Texas	6
Cornell University	7	R. I. College of Education	1	University of Toledo	2
Dartmouth College	18	Rice Institute	5	University of Virginia	3
Drexel Institute	5	Roanoke College	2	University of Washington	16
Drury College	1	Rockhurst College	1	University of Wisconsin	3
Duke University	2	Rutgers University	2	Utah State Agric. Coll.	2
Emmanuel College	1	St. Lawrence University	1	Vanderbilt University	2
George Washington Univ.	3	St. Louis University	1	Virginia Military Inst.	2
Georgetown University	2	St. Mary's University		Virginia Polytech. Inst.	1
Georgia School of Tech.	5	(San Antonio, Texas)	1	Washington & Lee Univ.	2
Hamilton College	2	Simmons College	1	Washington College	1
Hamden-Sidney College	1	Smith College	1	Washington University	2
Hardin-Simmons Univ.	1	Southwestern College	1	Wellesley College	3
Harvard University	35	Stanford University	13	Wesleyan University	3
Haverford College	5	State Coll. of Washington	1	West Virginia University	2
Hobart College	1	State University of Iowa	3	Westminster College	1
Holy Cross College (Mass.)	1	Stevens Inst. of Tech.	2	Wheaton College	1
Illinois College	1	Swarthmore College	5	William and Mary College	1
Iowa State Coll. of A. & M. A.	1	Syracuse University	3	Williamette University	1
Johns Hopkins University	2	Tarkio College	1	Williams College	5
Kansas State Agri. College	3	Temple University	4	Wilson College	1
Kent State University	1	Texas Agri. & Mech. Coll.	5	Wittenberg College	2
Kenyon College	1	Texas Tech. College	3	Woodstock College	2
Lafayette College	2	The Principia	2	Worcester Polytech. Inst.	4
Lehigh University	4	Tufts College	6	Yale University	10
Louisiana State Univ.	2	Tulane University of La.	3	Total	721
Lowell Textile Institute	2	Union College (N. Y.)	32	Number of American Col- leges Represented	180
Loyola University	1	U. S. Military Academy	2	Number of Foreign Col- leges Represented (Not listed)	66
Lynchburg College	1	University of Akron	1	Total	246
Marshall College	2	University of Alabama	1		
Mass. Coll. of Pharmacy	1	University of Arkansas	2		
Mass. Inst. of Tech.	155				

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	26	15	6	5	52
Second year	11	27	8	14	60
Third year	—	14	13	30	57
Fourth year	—	—	1	6	7
Graduate year	—	—	10	209	219
Total	37	56	38	264	395

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 1937	Other Grad- uates	Total
	Sept. 1937	Pre- vious Years		Sept. 1937	Previous Years		Total				
					Under- grad.	Grad.						Under- grad.	Grad.
Aeronautical Engineering XVI	5	17	22	—	18	2	22	42	2	2	4
Architectural Engineering IV-A	—	—	—	2	8	5	7	—	—	—	—
Architecture IV, IV-B, IV-C	8	14	22	2	3	3	9	22	2	2	4
Biology and Public Health VII, VII-A	1	6	7	2	3	1	7	15	7	7	14
Building Engineering and Construction XVII	2	2	3	1	—	—	—	1	—	—	—
Business and Engineering Administration XV	6	28	34	4	8	1	6	15	2	7	9
Chemical Engineering X, X-A, X-B	24	30	54	4	46	1	58	109	13	4	17
Chemistry V	2	6	8	2	19	3	37	58	1	19	20
Civil Engineering I	9	6	15	2	20	3	6	31	1	2	3
Army Engineer (in Civil Eng. Department)	—	—	—	—	15	—	—	15	—	—	—
Economics and Engineering VI, VI-A, VI-B, VI-C	22	42	64	14	25	9	31	79	27	8	35
Electrical Engineering IX	—	—	—	—	—	—	—	—	—	—	—
Electrochemical Engineering XIV	1	3	4	2	—	—	—	1	—	—	—
General Engineering IX-B	—	9	9	—	—	—	—	2	—	—	—
General Science IX-A	—	3	3	1	—	—	—	1	—	—	—
Geology XII	1	2	3	1	12	1	7	20	—	—	—
Mathematics XVIII	—	1	1	—	3	—	3	8	—	—	—
Mechanical Engineering II, II-A	24	27	51	8	3	3	21	37	2	3	5
Army Ordnance (in Mech. Eng. Department)	—	—	—	—	—	—	—	—	9	5	14
Metallurgy XIX	1	3	4	1	12	2	8	16	2	3	5
Mining Engineering III	4	4	8	—	5	—	—	6	—	—	—
Naval Architecture XIII, XIII-C	6	10	16	4	3	2	3	6	—	—	—
Naval Construction XIII-A	—	—	—	6	—	8	7	21	—	—	—
Physics VIII	3	4	7	—	16	—	25	41	4	10	14
Sanitary Engineering XI	—	—	—	—	1	—	1	2	—	1	1
Unclassified	6	11	17	3	1	1	—	4	—	—	—
Total	124	228	352	52	219	39	255	565	68	75	143

TABLE 12
NUMBER OF DEGREES AWARDED IN DECEMBER, 1937 AND JUNE, 1938

Name of Course	S. B.		B. Arch.		S. M.		M. Arch. and M. C. P.		Ph. D.		Sc. D.		Totals	
	Dec. '37	June '38	Dec. '37	June '38	Dec. '37	June '38	Dec. '37	June '38	Dec. '37	June '38	Dec. '37	June '38	Dec. '37	June '38
Aeronautical Engineering	3	22	—	—	4	10	—	—	—	—	—	—	7	32
Architectural Engineering	—	3	2	16	—	—	6	3	—	—	—	—	8	19
Architecture	—	—	—	—	—	—	—	—	1	—	—	—	—	1
Biology	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Biology and Public Health	—	1	—	—	—	—	—	—	—	—	—	—	—	4
Building Engineering and Construction	—	4	—	—	—	—	—	—	—	—	—	—	—	4
Business and Engineering Administration	7	48	—	—	3	8	—	—	—	—	—	—	10	56
Ceramics	—	—	—	—	1	—	—	—	—	—	1	1	1	1
Chemical Engineering	3	45	—	—	6	2	—	—	—	—	2	8	11	55
Chemical Engineering Practice	1	5	—	—	4	20	—	—	—	—	—	—	5	25
Chemistry	1	12	—	—	5	1	—	—	2	8	—	—	8	21
City Planning	—	—	—	1	—	—	3	3	—	—	—	—	3	4
Civil Engineering	1	21	—	—	1	—	—	—	—	—	2	2	2	32
Economics and Engineering	—	—	—	—	1	2	—	—	—	—	—	—	1	2
Electrical Engineering (Inc. VI-A)	1	60	—	—	4	45	—	—	—	—	—	7	5	112
Electrochemical Engineering	—	3	—	—	—	—	—	—	—	—	—	—	—	3
General Engineering	4	23	—	—	—	—	—	—	—	—	—	—	4	23
General Science	—	5	—	—	—	—	—	—	—	—	—	—	—	5
Geology	—	1	—	—	—	—	—	—	1	1	—	—	1	2
Industrial Biology	1	6	—	—	—	—	—	—	—	—	—	—	1	7
Marine Transportation	—	5	—	—	—	—	—	—	—	—	—	—	—	5
Mathematics	—	2	—	—	—	1	—	—	—	—	—	—	—	6
Mechanical Engineering (Inc. II-A)	3	49	—	—	5	18	—	—	—	3	1	1	9	68
Metallurgy	—	10	—	—	1	1	—	—	—	—	—	4	1	15
Meteorology	—	—	—	—	—	3	—	—	—	—	—	3	—	6
Mining Engineering	—	4	—	—	—	—	—	—	—	—	—	—	—	5
Naval Architecture and Marine Engineering	2	16	—	—	—	—	—	—	—	—	—	—	2	16
Naval Construction	—	—	—	—	—	7	—	—	—	—	—	—	—	7
Petroleum Engineering	—	—	—	—	—	1	—	—	—	—	1	1	1	4
Physics	1	14	—	—	—	1	—	—	2	4	—	—	4	23
Public Health Engineering	1	—	—	—	—	—	—	—	—	—	—	—	1	1
Sanitary Engineering	—	2	—	—	1	—	—	—	—	—	—	—	1	2
Without Course Classification	—	—	—	—	5	19	—	—	—	—	—	—	5	19
Totals	29	361	2	17	41	149	9	6	5	18	5	30	91	581

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. (Inc. II-A)	Metalurgy**	Military Eng. and Metallurgy	Mining Eng. and Metallurgy	Naval Arch.	Physics	Sanitary Eng.	Total	Total by Decades	
1868	—	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	—	—	—	—	—	—	—	14	14	
1869	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	5	5	
1870	—	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	10	10	
1871	—	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—	—	12	12	
1872	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	17	17	
1873	—	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—	—	—	—	—	—	—	—	26	26	
1874	—	—	—	—	—	—	—	—	—	10	—	—	—	—	—	—	—	—	—	—	—	—	—	18	18	
1875	—	—	—	—	—	—	—	—	—	10	—	—	—	—	—	—	—	—	—	—	—	—	—	28	28	
1876	—	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—	—	—	—	—	—	—	—	43	43	
1877	—	—	—	—	—	—	—	—	—	12	—	—	—	—	—	—	—	—	—	—	—	—	—	32	32	
1878	—	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—	—	19	19	
1879	—	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	—	—	—	—	—	—	—	23	23	
1880	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8	
1881	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	23	23	
1882	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	24	24	
1883	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	19	19	
1884	—	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	36	36	
1885	—	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	28	28	
1886	—	—	—	—	—	—	—	—	—	9	—	—	—	—	—	—	—	—	—	—	—	—	—	69	69	
1887	—	—	—	—	—	—	—	—	—	10	—	—	—	—	—	—	—	—	—	—	—	—	—	58	58	
1888	—	—	—	—	—	—	—	—	—	11	—	—	—	—	—	—	—	—	—	—	—	—	—	77	77	
1889	—	—	—	—	—	—	—	—	—	17	—	—	—	—	—	—	—	—	—	—	—	—	—	103	103	
1890	—	—	—	—	—	—	—	—	—	23	—	—	—	—	—	—	—	—	—	—	—	—	—	103	103	
1891	—	—	—	—	—	—	—	—	—	18	—	—	—	—	—	—	—	—	—	—	—	—	—	133	133	
1892	—	—	—	—	—	—	—	—	—	22	—	—	—	—	—	—	—	—	—	—	—	—	—	129	129	
1893	—	—	—	—	—	—	—	—	—	36	—	—	—	—	—	—	—	—	—	—	—	—	—	138	138	
1894	—	—	—	—	—	—	—	—	—	41	—	—	—	—	—	—	—	—	—	—	—	—	—	146	146	
1895	—	—	—	—	—	—	—	—	—	33	—	—	—	—	—	—	—	—	—	—	—	—	—	191	191	
1896	—	—	—	—	—	—	—	—	—	48	—	—	—	—	—	—	—	—	—	—	—	—	—	179	179	
1897	—	—	—	—	—	—	—	—	—	33	—	—	—	—	—	—	—	—	—	—	—	—	—	199	199	
1898	—	—	—	—	—	—	—	—	—	32	—	—	—	—	—	—	—	—	—	—	—	—	—	176	176	
1899	—	—	—	—	—	—	—	—	—	33	—	—	—	—	—	—	—	—	—	—	—	—	—	185	185	
1900	—	—	—	—	—	—	—	—	—	23	—	—	—	—	—	—	—	—	—	—	—	—	—	200	200	
1901	—	—	—	—	—	—	—	—	—	32	—	—	—	—	—	—	—	—	—	—	—	—	—	192	192	
1902	—	—	—	—	—	—	—	—	—	35	—	—	—	—	—	—	—	—	—	—	—	—	—	190	190	
1903	—	—	—	—	—	—	—	—	—	39	—	—	—	—	—	—	—	—	—	—	—	—	—	232	232	
1904	—	—	—	—	—	—	—	—	—	34	—	—	—	—	—	—	—	—	—	—	—	—	—	244	244	
1905	—	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—	—	278	278	
1906	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	208	208	
1907	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	230	230	
1908	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	232	232	
1909	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	251	251	
1910	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	232	232	
1911	—	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	261	261	
1912	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—	—	269	269	
1913	—	—	—	—	—	—	—	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—	—	304	304	
1914	—	—	—	—	—	—	—	—	—	10	—	—	—	—	—	—	—	—	—	—	—	—	—	289	289	
1915	—	—	—	—	—	—	—	—	—	14	—	—	—	—	—	—	—	—	—	—	—	—	—	321	321	
1916	—	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	345	345	
1917	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	324	324	
1918	—	—	—	—	—	—	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—	—	—	299	299	
1919	—	—	—	—	—	—	—	—	—	6	—	—	—	—	—	—	—	—	—	—	—	—	—	319	319	
1920	—	—	—	—	—	—	—	—	—	15	—	—	—	—	—	—	—	—	—	—	—	—	—	565	565	
1921	—	—	—	—	—	—	—	—	—	15	—	—	—	—	—	—	—	—	—	—	—	—	—	637	637	
1922	—	—	—	—	—	—	—	—	—	25	—	—	—	—	—	—	—	—	—	—	—	—	—	608	608	
1923	—	—	—	—	—	—	—	—	—	23	—	—	—	—	—	—	—	—	—	—	—	—	—	557	557	
1924	—	—	—	—	—	—	—	—	—	17	—	—	—	—	—	—	—	—	—	—	—	—	—	555	555	
1925	—	—	—	—	—	—	—	—	—	76	—	—	—	—	—	—	—	—	—	—	—	—	—	561	561	
1926	—	—	—	—	—	—	—	—	—	121	—	—	—	—	—	—	—	—	—	—	—	—	—	514	514	
1927	—	—	—	—	—	—	—	—	—	114	—	—	—	—	—	—	—	—	—	—	—	—	—	471	471	
1928	—	—	—	—	—	—	—	—	—	84	—	—	—	—	—	—	—	—	—	—	—	—	—	496	496	
1929	—	—	—	—	—	—	—	—	—	76	—	—	—	—	—	—	—	—	—	—	—	—	—	505	505	
1930	—	—	—	—	—	—	—	—	—	49	—	—	—	—	—	—	—	—	—	—	—	—	—	471	471	
1931	—	—	—	—	—	—	—	—	—	38	—	—	—	—	—	—	—	—	—	—	—	—	—	496	496	
1932	—	—	—	—	—	—	—	—	—	74	—	—	—	—	—	—	—	—	—	—	—	—	—	401	401	
1933	—	—	—	—	—	—	—	—	—	86	—	—	—	—	—	—	—	—	—	—	—	—	—	410	410	
1934	—	—	—	—	—	—	—	—	—	87	—	—	—	—	—	—	—	—	—	—	—	—	—	374	374	
1935	—	—	—	—	—	—	—	—	—	19	—	—	—	—	—	—	—	—	—	—	—	—	—	329	329	
1936	—	—	—	—	—	—	—	—	—	62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1937	—	—	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1938	—	—	—	—	—	—	—	—	—	21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	293	170	865	279																						

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	Economics & Engineering	Electrical Eng. (Inc. VI-A)	Electrochemical Eng.	Fuel and Gas Eng.	General Science	Geology	Mathematics	Mech. Eng. (Inc. II-A)	Metalurgy	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
1888																														1
1889																														1
1890																														1
1891																														1
1892																														1
1893																														1
1894																														1
1895																														1
1896																														1
1897																														1
1898																														1
1899																														1
1900																														1
1901																														1
1902																														1
1903																														1
1904																														1
1905																														1
1906																														1
1907																														1
1908																														1
1909																														1
1910																														1
1911																														1
1912																														1
1913																														1
1914																														1
1915																														1
1916																														1
1917																														1
1918																														1
1919																														1
1920																														1
1921																														1
1922																														1
1923																														1
1924																														1
1925																														1
1926																														1
1927																														1
1928																														1
1929																														1
1930																														1
1931																														1
1932																														1
1933																														1
1934																														1
1935																														1
1936																														1
1937																														1
*1938																														1
Total	132	19	84	28	47	3	199	450	114	193	9	874	27	26	1	36	30	258	31	20	27	10	254	5	3	53	14	19	500	3,466

* 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	14	4	4	2
1937	9	2	11	3
*1938	16	1	3	3
Total	118	11	113	8

TABLE 16
DEGREES OF DOCTOR OF PHILOSOPHY AWARDED

Year	Biology	Chemistry	Geology	Mathe- matics	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	—	15	—	3	12	30
1937	2	11	4	1	10	28
*1938	2	8	1	3	4	18
Total	24	175	30	23	44	296

*Includes only June degrees.

TABLE 17
DEGREES OF DOCTOR OF SCIENCE AWARDED

Year	Aero. Eng.	Ceramics	Chem. Eng.	Chem- istry	Civil Eng.	Elec. Eng.	Electro- chem. Eng.	Geology	Mathe- matics	Mech. Metal Eng. lurgy	Meteor- ology	Min. Naval Eng. Arch.	Petro- leum Eng.	Physics	San. Eng.	Total
1911.	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1
1912.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1913.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1914.	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1
1915.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1916.	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1917.	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
1918.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1919.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1920.	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
1921.	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
1922.	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
1923.	1	—	—	—	—	1	—	1	—	1	—	—	—	2	—	3
1924.	—	—	2	—	—	—	—	—	—	3	—	—	—	1	—	6
1925.	1	—	3	—	—	—	—	—	—	4	—	—	—	—	—	7
1926.	—	—	1	—	—	—	—	—	—	2	—	—	—	—	—	6
1927.	—	—	—	1	1	1	1	—	—	1	—	—	—	—	—	10
1928.	1	—	5	—	—	2	—	—	1	—	—	—	—	—	—	6
1929.	—	—	3	—	1	—	—	—	—	1	—	—	—	—	—	20
1930.	—	—	9	—	—	6	—	—	—	1	—	—	—	—	—	9
1931.	—	—	3	—	—	3	—	—	—	1	—	—	—	—	—	14
1932.	—	—	5	2	1	2	—	1	—	1	—	—	—	2	—	24
1933.	—	—	10	1	—	3	—	—	1	1	—	—	—	—	—	13
1934.	—	—	3	—	—	2	—	1	2	—	1	—	—	—	1	14
1935.	—	—	2	1	—	4	—	—	—	2	—	—	—	—	—	24
1936.	2	—	12	1	—	—	—	—	—	1	—	—	—	—	—	23
1937.	1	1	9	—	2	6	—	—	—	3	—	—	—	—	—	30
*1938.	—	1	8	—	1	—	—	—	—	4	—	—	—	—	—	—
Total	9	4	75	8	8	42	2	5	5	14	5	3	1	15	1	230

* 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 (1868-1938)

Bachelor of Science	16,453
Bachelor in Architecture	118
Bachelor of Architecture in City Planning	11
Master of Science	3,466
Master in Architecture	113
Master in City Planning	8
Doctor of Philosophy	296
Doctor of Science	230
Doctor of Public Health	4
Doctor of Engineering (<i>Discontinued after 1918</i>)	4
Grand Total	20,703

Director of Admissions. During the year the policy of selective admission has undergone further development, particularly with regard to the procedure of interviews with candidates. During the preceding year candidates had been encouraged to arrange such conferences, and those at a distance were put in touch with the nearest Honorary Secretary of the Institute. This year the further step was taken of making the conference a required part of admission procedure, to be omitted only in exceptional cases.

The appointment of Mr. R. M. Kimball as Assistant Director of Admissions has made it possible for someone to be on hand at all times to confer with the increased number of prospective students and their parents who call at the Admissions Office as a result of this added requirement. The 175

Honorary Secretaries as well as officers of alumni clubs in cities throughout the United States and in foreign countries have given generously of their time for conferences with candidates. The Honorary Secretary is an alumnus carefully selected because of his loyalty to Technology, his standing in his community, and his interest in advising with young men and their parents. The reports received from these men have been of the utmost value in the process of student selection, while their coöperation has helped to maintain the geographical diversification of the student body and so keep the Institute "rooted" in every section of the nation.

The pre-admission conference, whether in the Admissions Office or with an Honorary Secretary at a distant point, serves a double purpose. It gives some indication of the candidate's interest in and fitness for the work of the Institute, and allows him to seek advice upon his educational program. While the Honorary Secretaries are not expected to be informed on the details of academic entrance requirements, they can, through their Institute background and business or professional experience, give helpful counsel to young men contemplating attendance at Technology.

The Admissions Office serves as a medium of contact and information, as well as selection. Contact is established with approximately ten students, for every one who actually enters. Initial inquiries may range all the way from a perfunctory request for a catalogue to prolonged and detailed correspondence. Since it has proved impossible to distinguish in advance between serious and merely casual inquiries, the policy has been adopted of referring *all* inquiries to the nearest Honorary Secretary. The latter is thus informed of every student in his region who may be interested in the Institute. At the same time it is made clear to the candidate that he is expected to take the initiative in arranging a conference if he wishes to apply for admission. As a result of these changes, the incoming mail of the office now amounts to 30,000 letters per year.

Of the ten colleges of liberal arts now included in the "Coöperative Plan," several report a very active interest in the plan among their students. These colleges realize that the plan is intended to apply only to students of superior ability

and that not all students wishing to undertake the program should be recommended. There is some tendency for students embarking upon their college program with the three-year two-year plan in view to decide later on that they will remain for four years in college before entering the Institute. It remains to be seen how great will be the urge to economize by saving one year. Conferences and correspondence with the ten colleges included in the plan have resulted in the formulation of curricula coördinated with our several Courses. In some cases, extensive curricular changes have been made so as to meet Institute requirements.

Since 1936 the Institute has been coöperating with the Progressive Education Association by admitting without examinations *any* student from one of the thirty schools in the association if he has the endorsement of his headmaster and if he has completed substantially the same program as that required for regular admission. Of the 12 students who have come in the last two years, all but one have done well.

A total of 1,535 applications was received for admission to the First Year Class. Notices of admission were sent to 798 of the applicants, of whom 649 registered. Seventeen former students returned as First Year students, making a total of 666 on the third day of the term. The number of cancellations during the summer of 1938 was greater than in 1937, but not as great as anticipated.

Contact with secondary schools has been maintained through visits, including a number made for the presentation of the "Technology Awards."

B. A. THRESHER.

Chairman of Committee on Summer Session. The registration of students for the regular subjects of the Summer Session increased 7.3 per cent over 1937 with the total of 1,416. Candidates taking entrance subjects increased 4.4 per cent with a total of 142.

In addition to the regular Summer Session subjects, the entrance subjects, and the engineering summer camp, the activities of the Summer Session include several special programs and conferences lasting from a few days to several weeks.

These programs are arranged primarily for graduate engineers who want to be brought up to date in the scientific and technical background in their particular field of specialization. Attractive programs were arranged in collaboration with the committee as follows:

Physics, for the sixth year, offered an extensive program on Spectroscopy and its applications. The total number registered was 56, distributed as follows: Practical Spectroscopy, 23; Spectroscopic Analysis, 29; and Applied Spectroscopy, 4. A three-day conference was attended by 233, an increase of 25 over last year, with a representation from 25 States, Canada, and Scotland.

The Department of Metallurgy held two courses in Ceramics, each of one week duration. The first was on the Nature of Glass and was attended by 18. Most of these were from the research laboratories of the glass companies; although a few came from other industries such as the dental industry. The second course on the Reactions in Ceramic Materials on Heating had a registration of 23, most of these coming from the research departments of the clay-working industry with the exception of two members from the faculty of other ceramic schools. Eight of the latter group attended last year's course.

The Mechanical Engineering Department held a two-day conference on Timber and Concrete with an attendance of 48.

For the fourth time a course in Theoretical and Applied Colloid Chemistry was offered with a full-time registration of 14 and three lecture registrations. Contrary to former years, the enrollment showed an increase in the numbers of those who are preparing to teach the subject. The geographical distribution of those registered proved that the course is well-known throughout the country. Eight States and Canada were represented.

The Department of Architecture offered a program jointly with the American Planning and Civic Association for a period of three weeks. The total number of participants was 12 and included a representation of six planning agencies and educational institutions. The subjects covered in the course on Principles of Planning included a survey of municipal problems in the field of transportation, zoning, housing, and recreation. The material in the course on Planning Techniques covered the

preparation of the preliminary survey, the master plan, the zoning ordinance, and map for a town or city with some consideration of regional and State plans. The course in Planning Administration was devoted to a consideration of municipal and State problems concerned with the carrying out of plans and the powers and duties of official planning agencies. A one-day conference sponsored by the Massachusetts Federation of Planning Boards and arranged by the Architectural Department and the American Planning and Civic Association was held in July with a registration of 67.

A six-week course on Textile Analysis was given with a registration of 14. The number was divided about equally between professors of household economics and technicians, most of whom came from the West and Middle West.

Courses in Modern Biology and Food Technology were offered for the first time. One of the students taking Food Technology was sent by an Australian food manufacturer, another was an army officer in charge of the subsistence branch of the Quartermaster Corps, United States Army, which has charge of all army rations. If this subject is offered next year, arrangements may be made which will result in other army officers being detailed here for study and coöperative research with the army on food research problems.

The Departments of Mathematics, and Economics and Social Science conducted a successful two-day conference on Engineering and Industrial Statistics, dealing particularly with the application of statistical methods to Mass Production and Quality Control with special reference to textile engineering. The registration was 127.

The registration at the summer surveying camp was materially increased due to the offering of our facilities to other engineering schools and colleges. The staff of the Department of Civil Engineering feel that this has been a wise move as it fosters a keener relationship and understanding between the student engineers of other institutions and our own. The total registration was 48. Of this number 23 took it as an Institute requirement, and six as an elective; 13 came from Newark College of Engineering, and one each from the University of New Hampshire, Rhode Island State, Case School of Applied Science, Northeastern, and Columbia. It is hoped that these

and other schools will make still greater use of our facilities next year.

The Summer Session Committee has new programs under consideration which will be made the subjects of memoranda to be submitted later.

R. D. DOUGLASS.

The Librarian. The total contents of the Institute Library on June 30, 1938 stood at the estimated figure of 332,007 volumes, of which about one-sixth are in the branch libraries.

A notable addition to the Library was the Kayser collection in spectroscopy, containing 139 books and 5,637 pamphlets, presented by the Friends of the Library who had purchased it from Dr. Heinrich Kayser of Bonn. For many years Dr. Kayser's collection was the nucleus of the world's information on spectroscopy. It is now housed in a protected section of the Eastman Library stack.

Quite different in character but of equal importance was the gift by the French Ministry of Education of 789 volumes of outstanding works by French authors in many fields of science and literature. All these volumes had been chosen by members of the Instructing Staff from a list previously supplied by the French Government.

For the first time in years it was possible to strengthen the Library in some of its weak spots by the purchase of small, carefully selected collections. Out of sums provided in the budget we purchased collections on Patents (\$100), Metals and Strength of Materials (\$175), and the History of Science (\$100).

Volumes added during the year totalled for the Central Library 3,764, for the branches 3,999; together 7,763. The discarding of 302 volumes left a net increase of 7,461.

The steady growth in the use of the Library, which has been a striking feature of its recent history, continued. The following table shows the home use of books ten years ago, five years ago, and in the past three years:

	1927-28	1932-33	1935-36	1936-37	1937-38
Central Library.....	23,749	36,246	41,457	43,983	47,781
Branch Libraries*.....	12,180	39,033	38,793	41,745	49,369
Total.....	35,929	75,279	80,250	85,728	97,150
* Walker Memorial circulation included in above		13,138	15,040	16,520	21,645

The above figures cover only loans made for one or two weeks or longer. Overnight and week-end loans during the past year totalled 12,768 in the Central Library and 12,310 in the branches, together 25,078. If added to the total given above, a complete home use of 122,228 volumes is shown.

Upon study of the circulation figures, two facts stand out. First, though it may be true, as widely believed, that the branch libraries "lighten the load" upon the Central Library to some extent, the circulation of the latter increased 8.6 per cent over last year. Also, the great increase in circulation from the branches is not due wholly to increase in the use of Walker Memorial Library (31 per cent over last year), for the use of the science and engineering branches increased nearly 10 per cent.

The number of alumni borrowers increased to 536. On inter-library loan we borrowed 344 volumes and lent 1,249, of which latter 306 went to college, public and miscellaneous libraries and 943 to the libraries of business firms. The Reference Librarian handled 2,239 telephone calls.

That the work done by the Library has been increasing out of proportion to its financial support is shown graphically by a fifteen-year chart prepared during the year for submission to the Library Committee. This chart showed convincingly the failure of book funds to keep pace with increase in circulation.

During the summer of 1937 the Central Library was kept open evenings until 8 p.m., to meet the needs of Summer Session students who could not use the Library during the day. This service was given publicity by a letter sent out to the instructing staff, and by bulletin board announcements. The attendance, however, was small.

Systematic instruction of Freshmen in the use of the Library was made possible this year through cordial coöperation of Professor Fassett and other members of the Department of English and History. The Librarian during the first week of the fall term addressed the entire Freshman Class on the general need of learning to use library books as tools; this lecture was followed on the next two days by classroom talks to each section of first year English on the actual processes to be followed in obtaining and using both books and periodicals.

These talks were given by seven members of the Library staff and seven members of the Department of English and History. Problems involving use of the Library were then given by the department staff. That even this limited amount of instruction in library use was of value to the first-year men became evident in succeeding weeks on their visits to the Library for work on problems or themes.

Talks to Electrical Engineering Honors Groups, and to Graduate students, as well as to VI-A Juniors taking summer work, were given by Mrs. Lane, Vail Librarian. As a method of obtaining course references, Mrs. Lane arranged with the students in several courses to report references to her regularly as soon as given out in class. This plan produced very satisfactory results, and played its part in a notable increase in the amount of reference service to students. Incidentally, the Vail reference shelves were used extensively by Course VIII men taking Experimental Physics. Among bibliographies compiled was a list of the published papers of Guglielmo Marconi, for Professor Jackson. Assistance was given also to Professor Dahl's Subcommittee of the S.P.E.E. Committee on Research in their investigation of possible inter-coöperation by engineering schools in the securing of current research data. Books and periodicals lent from the Vail desk to students, alumni, instructing staff, and others totalled 15,293 items.

The report of the Eastman Librarian shows an attendance during the year of 30,000 readers, a gain of 11 per cent over the previous year. The circulation of one- and two-week books (6,272) was an increase of 25 per cent over the previous year; that of overnight books (6,743) an increase of 29 per cent, due in part to the WPA workers on Professor Harrison's spectroscopy project. The total home use has nearly doubled in the past two years. The acquisition of the Kayser Collection in spectroscopy has been noted above. A catalog of the pamphlets in the collection is in preparation.

The facilities of the Lindgren Library were increased by the acquiring of an adjoining room as a map room through the benefaction of Mrs. Gertrude Schwarz Hinckley. Mrs. Hinckley presented the equipment of map and atlas files and tables in memory of her father, Theodore E. Schwarz, a member of the

Class of 1876, and the room was named for him. Arrangements for the conversion of this room into a map room were handled by the Department of Geology.

The great event of the year was the making over of the old lecture hall in 5-330 into a branch library to serve the Departments of Civil Engineering, Mechanical Engineering, Naval Architecture and Marine Engineering, Economics and Social Science, and Business and Engineering Administration, thus doing away with the outgrown libraries in 1-290 and 5-115. Having three exits, the room is hardly ideal for library service, yet it has been fairly well adapted for its purpose by the addition of a wide balcony and the use of modern lighting and equipment. The total capacity is estimated at somewhat under 50,000 volumes. Professor Voss supervised the reconstruction, Professor Moon advised on the lighting, and Mr. Harry Carlson assisted the Librarian in working out a color scheme based on gray-green bronze. The branch will be administered by an Engineering Librarian, Mr. McNay, and an Economics Librarian, Miss Klingenhagen. The latter will work in close harmony with the research staff of the Industrial Relations Section of the Department of Economics, housed in an adjoining room. The Library was named in honor of Dr. Davis R. Dewey, associated with the Department of Economics since 1886. It was opened February 1, 1938, and dedicated with simple ceremony June 6, Alumni Day.

The provision of a Mechanical Engineering collection for this branch involved the preparation of a list of required books and periodicals under the direction of Professor Keenan, the transfer from the Central Library of as much material on the list as could be spared without inconvenience to other departments, and the purchase of additional titles.

The creation of a consolidated catalog for the new branch, a long and tedious task requiring the service of extra catalogers, was complicated by the desire of the Departments of Economics and of Business and Engineering Administration to reclassify their material. Re-classification is an expensive luxury for any library, but in the present case the fact that the material is to be used for class work direct from the shelves is a strong argument for the re-working of the admittedly unsatis-

factory decimal classification in the subjects named. At the end of June re-classification was one-quarter completed.

Walker Memorial Library was this year kept open full time throughout the summer, and Sunday opening was resumed in February with an average attendance of 42 per Sunday. The use of this Library increased enormously, showing in home use alone a gain of 31 per cent. This does not, however, give the whole picture, since a great deal of reading is done in the Library; moreover, a large part of the librarian's time is required for the answering of reference questions asked by students in connection with their courses, including requests for the recommendation of books for personal reading. She has also the handling of phonograph record circulation. Altogether, the work of the Library has become too heavy a load for one librarian, and an assistant should be provided for the coming year.

The Library Committee, consisting this year of Dr. R. S. Williams, chairman, and Professors Mirabelli, Roberts, Allis, Huntress, Lessells, and the Librarian ex officio, held frequent meetings and gave careful thought to the needs of the Library. In its consideration of next year's budget the committee recognized that the prescribed limitation of increase to 3 per cent would not meet the actual needs of the Library for more books, and therefore recommended no increase in book funds, but an increased amount for supplies, long-needed increases in a few salaries, and the permanent addition of a clerical assistant. The budget for 1938-39 conforms to these recommendations.

The Corporation Committee on the Library was composed of Dr. Harlow Shapley, chairman, William H. Bovey '94, and F. W. Garber '03. Dr. Shapley showed his active interest in the Library by frequent visits and by taking part in the dedication of the Dewey Library. Mr. Bovey visited the Library shortly after Commencement.

The Friends of the Library, continuing under the chairmanship of John E. Burchard '23, financed the acquisition of the Kayser Collection. On Alumni Day they issued the first number of a bulletin, *Footnotes*, handsomely printed by D. B. Updike. A prize of twenty-five dollars for a bookplate to be used in books donated through the Friends was offered, and the

design of Stephen L. MacDonald, a Junior in Course IV, was accepted.

Activities in connection with Alumni Day included the distribution of a revised issue of the *Technology Bookshelf*, the publication of a booklist, "Design in Modern Life," in preprint form (later appearing in the *Technology Review*, July, 1938) and an exhibit in the main floor corridor of modern books illustrating The Influence of Science on the Arts, the subject of the Alumni Day symposium.

Other exhibits showed books on Early Magnetic Theory and on Civil Engineering as represented in the Baldwin Collection.

The Library Staff Association had a successful year. Professor D. C. Jackson and Mrs. Katharine Maynard were among the speakers at its regular meetings. The Handbook was issued in a small provisional edition, mimeographed.

Miss Hazen and Miss Stiles attended the Pittsburgh meeting of the Special Libraries Association, and visited technical libraries in that vicinity. The Librarian and several members of the staff attended the meeting of the New England College Librarians at Simmons College in May.

A most welcome gift was the drinking fountain presented to the Library by the Class of 1937, and erected in the lobby of the Central Library.

Besides the two notable gifts of books referred to earlier, valuable works were received from Dr. Waldemar Lindgren and from the estates of Professor F. A. Laws and Professor Dwight Porter. At the request of Dr. Lindgren the Norwegian and Swedish geological surveys presented long sets of their publications.

Every year the Library receives many requests from other university libraries for Institute publications in exchange for their own. In such cases the Institute Library is at a decided disadvantage as it has had no M. I. T. publications to send in exchange since the "Contributions" series was discontinued in 1932, and it is obliged to refer the requests to the few departments which distribute their own reprints. The matter of one general exchange system for the whole Institute, whereby the Library might benefit, ought to be reopened, and the methods followed in other universities studied.

More adequate financial support for the Institute Library is needed. The Library has been growing rapidly into a university library, from which a most comprehensive service over an ever-expanding field is constantly demanded. The Institute cannot afford to follow a policy of steady expansion of its activities in teaching and research without at the same time supporting in due proportion the increased burden of service thus placed upon the Library. In the year 1937/38 the operating expense of the Library was but 2.22 per cent of the operating expense of the Institute as a whole. It should be remembered that the Institute Library lacks the abundant reserve of endowment funds which helps out many a college and university library. The Librarian recommends again that the Institute re-evaluate its Library, support a self-survey of its needs, increase the amounts appropriated for books and binding accordingly, and strengthen the Library staff where additional help is needed. At least three, possibly four, additional assistants are needed. At the same time, as urged in last year's report, study should be made of the need for a new library building and the accommodations and facilities to be expected of it, in order that a plan may be ready whenever a donor comes forward with a gift adequate to the purpose.

W. N. SEAVER.

Director of Division of Industrial Cooperation.

There has been no material change in the policy of operation of the Division of Industrial Coöperation or in the amount of business handled by it during the last year. Our efforts have been continued to encourage consultation work on the part of the staff and such industrial research as cannot readily be handled with the staff and facilities available elsewhere.

The recent course of the development in color analysis gives an unusually clear illustration of the Division procedure in aiding industry. Several years ago Professor Hardy of the Department of Physics realized the importance of having a method of standardizing and comparing colored materials used in industry and he has proceeded with great zeal and ingenuity to develop a color analyzer and to apply it to one after another of a great number of industrial problems. He has carried out,

through the Division of Industrial Coöperation, a tremendous number of color measurements and tests presented us by industrial organizations. Recently duplicates of the equipment have been made available through manufacturers of apparatus and equipment and a considerable number of skilled workers in the field have been turned out by the laboratory. This equipment and competent operators being now available to commercial testing laboratories, we have discontinued making commercial tests and investigations in this field and have returned our staff and equipment to the original task of carrying on further developments in color analysis. I am citing this instance as an illustration of the Division's method of handling such developments.

Industrial research problems have been under way during the year through the Division of Industrial Coöperation in nearly every Department of the Institute. The work is most active in the laboratories devoted to physical metallurgy, stress analysis, ceramics, building construction, biology, color analysis, and textiles. The problems relating to the corrosion of stainless steel, to the creep of steel at high temperature, the investigation of warp sizing, the investigation as to the physical characteristics of lime mortar, and the studies of refractory clays, are among the problems which have been continued during the year.

The Placement Bureau. The opportunity of the Placement Bureau to be of service to alumni was curtailed by the 1937 depression over the previous year. However, increased industrial contacts somewhat compensated for the abnormal decline imposed by business conditions. During the year, 955 requests for men were received from industry. Approximately 3,000 recommendations were made.

Industrial recruiting of the graduating class continued, though at a reduced pace compared to 1937. Sixty-three per cent were placed at the time of graduation with customary preference being shown for men with advanced training.

A year's experience with punch card classification has proved its worth, particularly as applied to the gathering of information on the graduating class. The information gathered by the use of this statistical equipment will be of material assistance in guiding placement policy for future classes.

C. L. NORTON.

Secretary of the Society of Arts. The subjects chosen for the four Popular Science Lectures offered annually to students in preparatory schools and to the public by the Society of Arts illustrated the type of research now being carried on in four widely different departments of the Institute, namely, that of Meteorology, Chemical Engineering, Metallurgy, and Electrical Engineering.

Professor Willett discussed the various factors which form the basis of weather forecasting, a matter of great importance to aviation.

Professor Hauser gave a beautifully illustrated lecture on the properties of matter in the colloidal state, this subject lending itself to elaborate and striking experimental demonstrations.

Professor Wulff illustrated by numerous electrochemical and other experiments the factors underlying the corrosion of metals, a subject of great economic importance at the present time and one upon which the speaker has done much research.

Professor Gray concluded the series with an elaborately illustrated lecture on vacuum tubes and their engineering applications. Of great interest to the audience was the actual construction of a radio tube on the lecture table. So enthusiastic were the audiences over this and Professor Hauser's lecture that requests were received for their repetition.

The titles of the lectures and dates upon which they were given are appended as a matter of record.

December 10, 11, 12 **THE AIR AND ITS WAYS.**
By Hurd C. Willett, Ph.D.

January 14, 15, 16 **THE PHYSICS AND CHEMISTRY OF MATTER
IN THE COLLOIDAL STATE.**
By Ernst A. Hauser, Ph.D.

February 11, 12, 13. **SURFACE FILMS AND CORROSION.**
By John Wulff, Sc.D.

March 11, 12, 13. **VACUUM TUBES AND THEIR ROLE
IN ENGINEERING.**
By Truman S. Gray, Sc.D.

H. M. GOODWIN.

Chairman of Committee on the Technology Museum.

The Museum Committee, with gratifying coöperation from several departments, has made progress in extending the corridor exhibits and in maintaining a series of rotating exhibits in the elevator alcove opening from the main lobby. Only the major achievements of the past year are listed here.

The entrance-way to Lowell Court has been made into a mathematics museum; various types of models are displayed here, some mechanically operated; and Professor Rule of the Drawing Department has contributed some of his drawings in descriptive geometry for use in a stereoscope. The Chemical Engineering Department has added a large working-model of a water-gas plant, presented by the Consolidated Gas Company through the courtesy of Mr. D. S. Reynolds '04, and has built up exhibits of colloidal chemistry and of water-flow. Near the Freshman drafting rooms a case has been installed to house some of Professor Mabie's models illustrating problems in descriptive geometry. The Physics Department has installed an exhibit of polarized light which is the beginning of a series of exhibits in optics. The Departments of Economics and Social Science and Business and Engineering Administration have installed an interesting series of financial and industrial charts. The Electrical Engineering display has been increased by the installation of a five-line automatic telephone demonstration set, and also by various exhibits of Professor Edgerton's stroboscopic effects. A scale model of an early New England pottery establishment is being made to give to the ceramics exhibits an industrial phase.

A new room, with cases for the display of prints, has been added to the Nautical Museum. This room now houses, as a loan exhibit, the extensive whaling collection of Mr. Henry P. Kendall, which includes numerous prints, paintings, scrimshaw, implements of the chase, ship models, and items illustrating industrial aspects. The exhibit was formally opened on December 12, 1937 with an address by Mr. Allan Forbes.

Gifts to the Museum include two large trophy cups (presented by Sir Thomas Lipton to American yachting associations) from Mrs. Francis Wright Fabyan, specimens of Inca pottery from Mrs. Francis R. Hart, three pieces of English pottery from Mrs. Harry M. Goodwin, and a coloroscope,

invented by Dr. Herbert E. Ives, from his son, Mr. Frederick Ives.

A new and important function of the Museum Committee is directing the Museum Workshop, familiarly known as the Hobby Shop. This was opened in the winter with a small but energetic group of students participating. Modern equipment has been installed for almost all kinds of wood and metal working. Various members of the staff have been most coöperative in the building up of the shop. Though primarily the shop is intended as a recreational center where the students can work out their own individual projects, yet certain students have, on their own volition, made commendable models for the departmental exhibits. This fall the shop has opened with enlarged quarters.

The first chairman of the Museum Committee, Dr. Edwin S. Burdell, recently assumed his duties as director of Cooper Union. His energy and vision, which contributed so much to our museum development, will be greatly missed.

A. C. WATSON.

Medical Director. The year has been the busiest in the history of the Hygiene Department. There have been years with a greater total number of visits because of epidemics but a total of over 23,000 clinical visits indicates the amount of work done in the Department during the past year. The year has been noteworthy for the broadening of our field of work.

For the first time all new employees of Technology were required to pass a rigid physical examination. Similar examinations were made of the employees of the various fraternity houses. Each employee was checked before being allowed to return to his duties after an absence of a period of a week or more on account of illness.

In the past, X-rays of the chest have been made for selected groups. This year the chests of all new students were X-rayed for the purpose of detecting early cases of tuberculosis.

The work of following up and correcting defects found at the annual physical examination has been extended. In addition to personal interviews with members of the Medical staff, lectures were given to groups of men having defects — sixty in

all — on heart trouble, high blood pressure, albumenuria and glycosuria.

The following figures give a summary of the work accomplished here during the year.

Clinic Cases

July.....	625	January	1,973
August.....	501	February	1,609
September.....	2,339	March.....	2,705
October.....	3,768	April.....	1,869
November.....	1,742	May.....	1,872
December	1,637	June.....	748
			21,388

Infirmiry Cases

July.....	60	January	129
August.....	66	February	111
September.....	86	March.....	140
October.....	142	April.....	126
November.....	140	May.....	146
December	101	June.....	73
			1,320

Men with defects.....	344
Men rechecked for defects.....	468

Total..... 23,176

Average height of all students, 70 inches.

Average weight of all students, 151¼ pounds.

Average Weight of Class

1941.....	145 pounds
1940.....	154 pounds
1939.....	160 pounds
1938.....	149 pounds
Graduate.....	149 pounds

Average Height of Class

1941.....	68 inches
1940.....	71 inches
1939.....	72 inches
1938.....	72 inches
Graduate.....	70 inches

A total of thirteen cases of contagious disease were recorded, two of which were scarlet fever. One death, that of an employee, occurred during the year.

A very important new work was the instruction in methods of artificial respiration.

A series of lectures and demonstrations was given to 117 men from the Electrical Engineering Department.

Now that Technology for the first time will be housed under one roof, we are hoping that the Hygiene Department may be of even greater service in the coming year.

GEORGE W. MORSE, M.D.

Director of News Service. Distribution of news on developments in various departments of the Institute increased during the year, which was the most active since establishment of the News Service in 1925. This increase in output of news was due in no small degree to the rapidly growing interest in the various summer conferences at which many newsworthy reports of progress in various fields of science and engineering are presented.

The News Service distributed 1,350 official news releases and coöperated with press associations, magazines and newspapers in arranging approximately 150 interviews with members of the faculty in various departments. A survey of editorial treatment of science news during the year indicates that developments in meteorology, aeronautical engineering, the technique of employing model structures in research, physics, particularly nuclear investigations, and electrical engineering led in interest.

Returns in news clippings from only a few key geographical points throughout the country and from the leading European countries indicates that newspapers alone published more than 1,000 columns, or approximately 1,100,000 words, of news text of the various types of Institute news during the year. This was supplemented by numerous photographs. Added to this was a notable increase in the amount of Institute news appearing in the leading weekly magazines, both in this country and abroad.

In addition to the various summer conferences, events which attracted special interest during the year were the Alumni Symposium on Science and Society, announcement of the Cabot Fund for studies of the utilization of solar energy,

Open House, the Sloan Fellowships, International Congress for Applied Mechanics, dedication of the Wright Brothers Wind Tunnel and the opening of the whaling exhibit in the Nautical Museum. The News Service increased its news output on the activities of individual students for the interest of home town newspapers. Election to activity offices, unusual scholastic achievements and special social events are of particular interest in this field. Individual stories on the award of every scholarship were sent to the home towns of students. The Technology Awards, presented to schools whose students excel in the five freshman subjects, have aroused wide editorial interest as important local news. The activities of the M. I. T. Nautical Association, the largest of its kind in the world, developed strong news interest throughout the year, both as a wholesome form of recreation and in the various intercollegiate regattas which drew college crews from various parts of this country and Canada.

In addition to distribution of official news to publications outside the Institute, the News Service, with the coöperation of Mr. J. Rhyne Killian, Editor of the *Technology Review*, prepared more than 50,000 words of Institute news which appeared in the Institute Gazette section of the magazine. The News Service also shared in the responsibility for the publication of Research Reports in coöperation with Mr. Killian and Professor Frederick G. Fassett, Jr.

The Institute's technical films "Graphic Representation of Machine Operations" and "Traveling Electrical Waves" continued to be in demand by secondary schools, colleges and technical organizations. Reports indicate that these films were seen by at least 10,000 persons during the year.

Whatever the News Service has accomplished in the gathering, preparation, and distribution of news on the many Institute activities could not have been done without the very friendly coöperation of members of the staff in all departments.

JOHN J. ROWLANDS.

SCHOOL OF ENGINEERING

Aeronautical Engineering. The year has been marked by the construction of the large Wright Brothers Memorial

Wind Tunnel which was dedicated at the meeting of the Fifth International Congress for Applied Mechanics in September. Although five staff men have worked during the year on various phases of its design, the services of Professor Peters in tunnel and propeller design, and of Professor Markham in balance design, have been particularly notable.

In the regular work of the Department, the principal items of interest during the year have been: the publication of Niles and Newell's "Airplane Structures," revised and enlarged to two volumes, the reorganization and extension of the courses in Instrumentation, the completion of five projects financed by outside agencies in the fields of Structures, Aerodynamics, Instrumentation, and Motors, and the publication of theoretical or experimental papers in each of these fields.

The undergraduate school continues to select a limited number of freshmen, now up to 35, out of a list of two or three times that number who apply for admission to the course. In the future, we shall restrict the number of students working toward advanced degrees to 60, including those in Meteorology. A larger number would lead, under present conditions, not only to placement difficulties but also to a serious crowding of drafting and laboratory rooms.

In order to provide needed space for the expansion of the graduate school, the division of Meteorology, and the Instrument Laboratory, the Institute should consider the matter of extending the third floor of Building 33 across the space which is now a part of the room housing the seven and one-half foot wind tunnel. This tunnel, made obsolete by the new one, can soon be abandoned and its space given over to more useful purposes.

J. C. HUNSAKER.

Building Engineering and Construction. The termination of the direct support of the Horowitz Foundation and the discontinuation of the course in Architectural Engineering made it advisable to consider a revision of the curriculum. Such a revision has been made and has been adopted by the Faculty. The professional courses in Building Construction have been reduced from six to three, and the educational

approach has been changed from a study of type of building to type of construction. The courses in structural analysis have been rearranged and reduced from four to three. Two of these are devoted to the structural design of reinforced concrete and structural steel. Courses in Electrical Engineering and Heat Engineering have been made required subjects. Electives have been confined to the fourth year and afford the student a choice between Building Engineering and Building Construction. Courses in Architectural History and Planning Principles have been added to the second year curriculum and the courses in Materials and Materials Testing have been strengthened and correlated.

The coöperation with other departments of the Institute in the matter of special lectures has been continued. Our staff has given lectures on concrete and wood for the Departments of Civil and Sanitary Engineering and Mechanical Engineering. The Departments of Chemistry and Metallurgy have given us special lectures on ferrous and non-ferrous metals and corrosion. It is hoped to extend this interdepartmental coöperation during the next year.

The Building Materials Research Laboratory has continued its work on masonry materials under a generous grant from The National Lime Association. The laboratory is now equipped with a high grade petrographic microscope and equipment for photomicrographic work. This year has seen the practical completion of an extensive series of volume change experiments on masonry mortars; the basic studies of the bond between brick and mortars by petrographic means have been substantially completed; a thorough analysis and study of the permeability of concretes has been started; what promises to be the first apparatus to measure accurately and perhaps quantitatively the plasticity, workability and sand-carrying capacity of cementitious matrices has been built and the first experiments are quite encouraging.

During the coming year the foregoing will be continued and in addition new studies on the factors affecting the strength of brick masonry and the effects of vibration on the integrity of brick masonry will be started. A generous grant by the National Lime Association is again available. With the transfer of our facilities to a laboratory in the new Architectural build-

ing an opportunity for more effective and uninterrupted work will be afforded.

During the year Professor Voss spoke on the subject "Why Masonry Walls Leak" to meetings of architects, engineers, builders, and materials men in fourteen cities of the East and South. The interest shown in the results of the research in our laboratories was evident from the total attendance of over two thousand at these meetings. He also spoke before the National Lime Association Convention in Cincinnati in May on "The Characteristics of Lime." Mr. Howard R. Staley who has been in direct charge of the Masonry Materials Research had his paper "A Petrographic Study of the Bond between Brick and Mortar" published and reprinted twice in American periodicals and a request for publication in England has been granted. Mr. Staley spoke on "Maintenance of Masonry Construction" before the meeting of the Association of Superintendents of Buildings and Grounds of Universities and Colleges held at the Institute in May. Mr. Albert G. Dietz has continued his graduate work in "Properties of Materials" and has made preliminary studies of some new uses of plywood and laminated built-up structural members. Mr. Donald Whiston will be added to the staff as laboratory assistant under the National Lime Association grant.

The sudden death of Professor Ross F. Tucker in December deprived us of the advice and encouragement which we knew he would offer as Professor Emeritus.

WALTER C. VOSS.

Business and Engineering Administration. During the year the Department has had for its objective the effecting of further advances in the program of simplification and coördination of curriculum, realism in teaching methods and close social relationships between students and instructing staff.

In the sophomore year, an important advance has been the presentation of a departmental subject in the opening term. This elongation of the departmental curriculum has proved a salutary step as reflected by the high degree of interest and effort on the part of the undergraduates. The required reading and industrial activity laid down for the summer following

the sophomore year have already reflected improvement in the facility with which students are approaching subsequent business subjects. Indeed, it has become clear that these orienting activities are of greatest educational import at this period in the curriculum.

In the junior year a promising development has been the closer coördination of economic theory and industrial practice. Arrangements were effected whereby Dr. Gerald Bruce Tallman who offers instruction in elementary marketing, also presented prior work in economics to departmental students, a procedure which will increase opportunity for illustrating the application of economic principles to current industrial problems.

During the junior-senior summer interim, optional requirements of summer reading or summer experience have been laid down. Junior students have also been encouraged to enroll for the Thorne-Loomis European industrial tour which this year made its most extended stay abroad, totalling eight weeks during which sixteen industrial establishments and ten different countries were visited.

The senior curriculum has undergone several constructive changes. The Industrial Accounting elective subject was redesigned for presentation on a markedly different basis from the usual procedure. This change necessitated the collection of a new body of text and case material which will assume published form in the near future.

The year has also provided opportunity to test the new curricular coördinations in Freshman and Sophomore English, Report Writing, Professional Electives and Thesis which were described in last year's report. The results have been satisfying, both in the quality of the product and in the greater facility shown in the selection of thesis subjects and preliminary preparation therefore.

During the Christmas vacation a considerable body of students enrolled in an industrial tour of mass-production manufacturing in the Detroit area, where visits were made to the plants of the Buick Motor Company and A. C. Spark Plug Company, Flint, Michigan, General Motors Research Laboratories, General Motors Diesel Factory, Ford Motor Company, and United States Rubber Company.

An interesting development has taken place in the conduct of the required senior subject, Industrial Problems. Conducted as a comprehensive examination extending over a complete term, the program has incorporated a series of current administrative problems presented by industrialists from their immediate business experience. These coöperating examiners have contributed a period at the beginning and at the end of each two-week assignment when explanations of written problems and a discussion of student solutions have taken place. For the first time this year, these industrialists were selected from a group of Course XV presidents whose companies are situated in New England. The group included Mr. Frederick Steele Blackall, Jr., president and treasurer of The Taft-Peirce Manufacturing Company, Woonsocket, R. I.; Henry C. Haskell, president Brunswick Woolen Mills, Moosup, Conn.; John M. Goodnow, president Hardware Products Company, Boston; Robert Tonon, president Peter Gray Corporation, Cambridge; Alan F. Howard, president Bemis Associates; Paul H. Howard, president Weymouth Art Leather Company, East Weymouth; and Harold Bugbee, president Walter B. Snow and Staff, Boston.

The undergraduate experience of these men made for a ready conformance of their problems to teaching requirements and contributed importantly to the ease and depth of discussions.

The present year marked the first period in which the plan of elective professional subjects has been fully in force. This Department in conjunction with the Department of Economics and Social Science offered eight such elective subjects during the first term and thirteen during the second term. As a result of the remarkably even dispersion of enrollment which was experienced, it is clear that the furtherance of this elective principle when coupled with earlier requirements of a comprehensive training in elementary subjects, was a step in the right direction. Class conduct in the elective groups has been at once placed on a more mature and individualistic basis and the effect has clearly been salutary.

In the field of graduate work, the year has brought a formulation of policy with regard to methods of satisfying prerequisites to advanced study. The two sessions of summer

teaching in this Department are directed primarily to the offering of intensive programs suitable for technical graduates of considerable maturity and several years of industrial experience or for graduate students working for a doctorate who wish to minor in business administration.

Applicants for advanced work without such maturity of experience or outlook have been required to care for prerequisites through a one-year program of studies. Results of this policy have thus far been promising. The increased emphasis on preparatory training has provided a sounder basis for advanced work and also has served to free advanced study groups from the delaying influence of the student of ordinary capacity.

Interest in the graduate year has shown a noteworthy swing to subjects of a broader economic and social nature. Here we are distinctly indebted to the Department of Economics and Social Science for its coöperation in enlarging the curriculum in these areas. Subjects relating to labor and labor legislation, to government control of industry and to sociological implications are increasing in attention while the addition of the new section of Industrial Relations is proving attractive to the student with a flair for social research. During the year the final steps in the development of the graduate subject, Contemporary Problems Seminar, have been taken and professors in the Department of Economics and Social Science have collaborated in taking charge of weekly preparation and discussion of current issues. The range of topics has included developments in American foreign commercial policy, new government legislation, aspects of the 1937 depression, and a study of the consumer movement.

A second grant of \$15,000 for post-industrial fellowships applicable to the school year of 1938-39 was authorized by the Alfred P. Sloan Foundation of New York, making possible the selection, by means of a national competition, of five fellowship recipients from a field of 164 applicants. These fellowships have brought about the attendance of industrial executives of distinctly greater maturity and responsibility than heretofore. While in previous years, members of these special groups have averaged 2.2 years of experience subsequent to graduation, the 1937-38 recipients of Alfred P. Sloan Foundation Fellow-

ships averaged 5.4 years of experience and the 1938-39 group averages 7.4 years. The program of selected studies has leaned strongly toward the social sciences, and there has been a desire further to audit subjects of this character. Guests of weekly dinner meetings have included labor leaders, personnel specialists, government officials and shop foremen in addition to the large number of cooperating industrialists. In addition these students have had the benefit of extensive contacts with general officials through plant visits in the Middle West and Central Atlantic States.

Out-of-classroom activities involving students and staff members have shown a continuing increase. In addition to the evening gatherings held each week for the benefit of the special graduate group, a similar series of monthly dinner conferences was arranged for regular graduate students. Senior students were likewise invited during the year to eight dinner meetings with business executives, most of which were held at the homes of members of the departmental staff. During the first term a series of open-house receptions was provided by faculty members to which all students were invited. Four departmental convocations were also held during the year at which the nature of a career in business administration was discussed.

Much thought has been given to the increase of laboratory work in the Department; and specific proposals for additional facilities for accounting, marketing and finance laboratories have been prepared and submitted. It is to be hoped that a way may be found further to develop these most important resources to departmental teaching.

ERWIN H. SCHELL.

Chemical Engineering. The year has witnessed healthy progress in both teaching and research. The educational load resulting from the largest graduate enrollment and increased size of junior and senior classes was compensated by additions to junior teaching staff so that excessive overloads were avoided. The Department's policy of utilizing young instructors to supplement the activities of its permanent staff was thereby tested rather thoroughly, and the results warrant its continuance. Research has profited from the appointment of

part-time research assistants, initiated this year, and from the high registration for the doctorate program.

The Institute's stabilization program on sophomore students has been particularly helpful to this Department. During the past few years more freshmen have registered for Chemical Engineering than for any other course, and our upper undergraduate years, wherein professional work is emphasized, would be seriously overcrowded if it were not for the drastic curtailment in sophomore enrollment permitted by the Stabilization plan. This curtailment has also ensured a more competent student group in the upper years.

The School of Chemical Engineering Practice has had a productive year and it was again necessary to operate an extra "off-season" group of graduate students to accommodate all the qualified men who applied for this work. During the year, the station at the Merrimac Plant of the Monsanto Chemical Company at Everett was transferred to the plant of the Cellulose Division of the Hercules Powder Company at Parlin, New Jersey. The new station offers many opportunities for student work and is favorably located for trips to the many industries of the New Jersey area. One of the major problems of the Practice School was high-lighted this spring when all three of its station directors accepted attractive positions elsewhere, one becoming head of the Chemical Engineering work at the University of Rochester and the other two taking important positions in development organizations in the steel and oil industries. Such losses seem unavoidable under our system of securing outstanding young men of all-round ability as directors, but the results to the School seem to outweigh the administrative disadvantages.

Close contact between the Practice School and the Department at Cambridge is maintained by frequent visits of the department head and of staff members to the field stations, and by review of Practice School reports by staff members at Cambridge. Laboratory work at the Institute and plant test studies at one of the stations were so coördinated in one instance as to form the basis of a paper presented under a joint authorship of Department and Practice School staff.

Heat transfer investigations on the boiling of liquids have extended the earlier data on "vapor-binding" phenomena,

which result when the temperature difference between the fluid and the metal becomes large. Experiments on boiling water at atmospheric pressure in natural convection evaporators in both a small single-tube apparatus and in a sixty-tube model gave results agreeing with those for a multitubular commercial apparatus. Vapor binding was found to occur with benzene at pressures up to five hundred pounds per square inch, but is not so serious as at atmospheric pressure.

The Department's program on gas absorption has progressed materially. A considerable quantity of new data on the performance of packed towers has been obtained, and a project on efficiencies of bubble-plate absorbers is well advanced. The theoretical studies on eddy-diffusion, presented at the International Congress for Applied Mechanics, are being followed by an investigation of the relative importance of eddy and molecular diffusion in the steady-state evaporation of water into a turbulent air stream. New data have also been obtained on the performance of packed towers in continuous solvent extraction.

Other studies of unit operations include a determination of the factors which fix the potential capacity of so-called molecular stills and a newly discovered phenomenon in filtration whereby the resistance of a filter cake is diminished by applying pulsating reductions in pressure.

A new long-range project has been initiated on the mechanism and space requirements for burning heavy fuel oil, in which the results of previous research on the combustion of powdered coal may prove applicable. The early work has included investigations of oil atomization and of the mechanism of combustion of individual drops of oil.

Gratifying progress has been made in the study of specific, industrially important chemical reactions to secure an insight into their mechanisms which may serve as a basis for developing sounder methods of process design and control. A previous report pointed out that in one of these reactions, the simultaneous oxidation and condensation of nitrogen oxides to nitric acid, a simple explanation for supposedly complex and irregular chemical phenomena was derived by applying methods which were developed in the study of purely physical processes of condensation and absorption. Similar success has

resulted from this combination of the engineering and the chemical approach in two other cases: the nitration of benzene and the vulcanization of hard rubber. The former is found to have a relatively simple chemical mechanism controlled by diffusional phenomena. In the latter, the chemical reaction is dominated by limitations of thermal conductivity. On the other hand, studies of the vulcanization of soft rubber have disclosed important chemical considerations. By comparing physical properties of the vulcanized rubber with the amount of sulfur which has combined and the changes in chemical unsaturation it is found that best physical properties are associated with least change in unsaturation of the rubber hydrocarbon during vulcanization. This work is also permitting an interpretation of the action of various types of accelerators.

The chemical utilization of the lower hydrocarbons and olefines for the synthetic production of widely used simple organic compounds such as alcohols, ketones, acids and alkyl halides is one of the main problems being studied by the Applied Chemistry group. Gases from petroleum refining offer a cheap and extensive supply of raw materials if practicable methods of separating them into relatively pure constituents can be devised. Separation can be effected by either fractional distillation or selective extraction. Distillation is generally one of the most efficacious means, but due to the low boiling points of the hydrocarbons very low temperatures and high pressures are required. In order to design and study the economics of such a process it is necessary to have vapor-liquid equilibria and enthalpy effects of mixtures at high pressure. Work on this line in the last year has developed a new high pressure equilibrium still with which it is possible to obtain vapor-liquid equilibrium data up to the critical pressure of the system in question, and efforts are being made to develop principles that will be applicable to high pressure equilibria in general. An apparatus has also been developed and used to measure the enthalpy effects due to these elevated pressures for pure constituents and their mixtures.

Separation by extraction is being studied with the view of developing selective solvents. Solutions of cuprous salts are known to be highly selective for olefines. Equilibrium data have been obtained for such solutions, and a small continuous

unit has given efficient separations of ethylene and propylene from saturated gases. The solid cuprous salts have also been found to be selective adsorbents for the lower olefines and diolefines, and equilibrium and rate of adsorption data are being obtained for these salts.

In the chemical utilization field, research is being continued on the direct hydration of olefines to alcohols. Recent work has developed improved conditions and catalysts for these hydrations. The oxidation of hydrocarbons is being studied and results indicate that good yields of organic acids can be obtained by the reaction of olefines with air.

It has long been recognized that the surface of liquids which contain surface-active materials are subject to ageing effects. A new apparatus has been developed which represents the first successful means for studying these ageing effects, uninfluenced by extraneous forces. This equipment also permits measurements of instantaneous surface tension or interfacial tension with a high degree of accuracy. It is proving useful both for scientific determinations of tension and for the study and evaluation of the action of wetting and dispersing agents and the like.

Continuation of the work on clays, fractionated to narrow size limits by the supercentrifuge, has led to the discovery that certain fractions have the property of forming strong, flexible and transparent films. These films resemble mica and seem to have real potentialities for electrical insulation. Other work in the colloid field includes an investigation of the colloidal nature of complex ions such as copper-ammonia and cobalt-ammonia, a theoretical study of the "sensitization" of colloids when too little protective agent is added, and continued basic research on the essential nature of gelation.

The Institute was host last June to the National Colloid Symposium, which drew attendance from a wide variety of professions and industries. This meeting, which was largely handled by members of the Department, well illustrated the catholic interest in colloids shared by medicine, biology, chemistry and diverse industries. The Department was strongly represented at the symposium on Drying held at Philadelphia by the American Chemical Society, at which the central paper was delivered by one of our staff. The summer course in Col-

loids for men from industry, given for the third time, repeated its earlier successes.

Placement of graduates, while definitely slower than in the previous year, was quite satisfactory considering the slack industrial conditions.

The interest and constructive advice of our departmental Visiting Committee has been of decided assistance in the formulation of our educational and research policies and the meeting this spring was notably productive of suggestions for future broad development.

WALTER G. WHITMAN.

Civil and Sanitary Engineering. In recent years the Summer Surveying Camp at East Machias has been the subject of study by the Administration and the Department. This complete plant was largely donated by interested alumni, who, though they themselves lacked the benefits of such a summer school, recognized its great value.

While the graduate registration in Civil Engineering has greatly increased, the undergraduate attendance is considerably below that of a decade ago. Hence the expense of operating such an extensive camp for only 30 to 40 students, when its capacity is sufficient for 100 students, has seemed excessive. The Administration decided, as an experiment, to offer the opportunities of the surveying camp for this and next year to all Technology students at a flat rate of \$100, including board and room, for the seven to eight weeks course, and, further, to extend this privilege to outstanding students in Civil Engineering of other colleges. This year 18 students from other institutions were admitted, and 6 from other Technology departments, who, together with students from our own Department, made a total of 48. The enthusiasm and performance of these outside students indicate clearly that this generous policy of the Institute has been gratefully accepted. We have reason to expect that next year the attendance will be greater and the contribution to education in this field correspondingly more impressive.

The hydraulic demonstration equipment for classroom teaching has been installed by Professor Russell and is serving

the purpose of developing effectively the visual demonstration of hydraulic phenomena.

The Structural Laboratory is in full operation under the direction of Professor Wilbur; many problems of indeterminate structures are being studied by the staff and by graduate students in thesis work. Apparatus for photoelastic study of structural models is being installed. It is expected that results from this division will soon be published.

Aided by a liberal grant from the Carnegie Corporation, Professor Ruge is extending his fundamental research in seismology. Much of the work of the year has been in collaboration with the United States Coast and Geodetic Survey. These coöperative projects have included a study of shaking table tests of strong-motion earthquake recorders and have demonstrated the fact that records of the accelerographs of the United States Coast and Geodetic Survey are reliable; a practical means of analysis of these records has been developed through the use of the Institute differential analyzer; report on this work will be published this fall. A photoelectric analyzer is being developed for studying the nature of earthquake motions in the United States. Some thirty records will be studied in coöperation with the United States Coast and Geodetic Survey.

A new type of electric strain gage, originally devised for celluloid model work in seismology, is being investigated for use in other fields of research; it probably represents a distinct advance in the technique of strain measurement.

Recent studies of earthquake-resistant elevated water tanks, which were made in our seismology laboratory in coöperation with the Associated Factory Mutual Fire Insurance Companies, led to the recommendation that damped spring elements be introduced in the diagonals of the towers. One of these full-sized spring elements has been built and tested for performance. It is expected that such elements will be introduced in several structures.

Cement research has been concentrated on the study of volume changes as affected by various causes, mainly temperature and moisture. Four papers were written by Professor Carlson relating in some manner to the subject of volume changes.

In addition to the research mentioned above, there has

been an extension of studies in the Soil Mechanics Laboratory directed by Professor Taylor, particularly relating to shearing strength of soils as determined by direct shear tests and cylindrical compression tests. Apparatus is being designed for studying the magnitude of side friction in consolidation tests. Studies have been made to determine stress-strain relationships by mechanical analogy in granular materials under various conditions of stratification and rebound.

Professor Camp has extended his experimental studies on the flow of clear water through clean sand of various grain shapes. In collaboration with Dr. Wadsworth of the Department of Mathematics, equations have been devised to express the quantitative effect of fluid turbulence upon retardation of settling of discrete particles in "fill and draw" and in "continuous flow" basins; laboratory experiments are being made to determine the validity of these equations.

Experimental investigations of about a dozen hydraulic problems have been carried on under the direction of Professor Reynolds in the River Hydraulic Laboratory, mostly as graduate thesis work.

The Desmond FitzGerald Medal for the best technical paper presented during the year before the Boston Society of Civil Engineers was awarded to Professor Taylor for his paper entitled "Stability of Earth Slopes." The Designers' Section Prize came to Professor Wilbur.

Professor Breed acted as consultant to the City of Boston on the Warren Avenue Bridge and to the Railroad Association of Canada on an economic analysis of the highway problem of the Province of Ontario. Professor Spofford has acted as consulting engineer to the Maine Highway Department, the Massachusetts Department of Public Works and the Lake Champlain Bridge Commission. Professor Carlson has served as consultant on three large government dams. Professor Taylor has served as consultant on the Claytor Development in Virginia.

Photographs of airplanes were received from the Glen L. Martin Co. of Baltimore; photographs and models of airplanes from the Chance-Vought Co., East Hartford, Conn.; photographs and data on the rigging of Cup Defenders from Sparkman & Stephens, New York City; and full-sized details and

photographs of modern light-weight railway train construction from Edward G. Budd Co., Philadelphia.

CHARLES B. BREED.

Electrical Engineering. There have been no major changes of policy or program within the Department of Electrical Engineering during the past year, but a number of minor developments have taken place which are worthy of specific mention.

Owing to the industrial recession it became necessary for the General Electric Company to curtail the program of shop experience for students taking coöperative work with that company. The group of sophomores who had been expected to go to the Works for the second term of the year were therefore kept at the Institute and continued the program of class and laboratory instruction there. None of the students enrolled for the coöperative instruction with the General Electric Company can be taken to the Works during the coming term. They will therefore continue their studies at the Institute. The Boston Edison Company was unable to take on an additional group for the coming year, but is continuing the program with the students enrolled with them last year. The Bell System has continued the program and has added a limited number of students for the coming year.

During the year eight colloquia were held for the graduate and senior students at which prominent representatives of successful business organizations discussed the developments and problems of these organizations.

A series of Staff Colloquia was also initiated and nineteen meetings were held at which new technical developments taking place at the Institute or elsewhere were presented by some one (usually a member of the staff of the Electrical Engineering Department) particularly interested in the subject and discussed by the group as a whole. The program of Staff Colloquia was well received and generally regarded as very helpful. The plan will be continued during the coming year.

The Student Branch of the American Institute of Electrical Engineers showed renewed activity during the year and was particularly helpful in planning and carrying through the

Department's part in Open House Day. Mr. McIlroy, who joined the staff a year ago and who is greatly interested in public speaking, was very helpful to a number of the students who were preparing to present technical papers at A. I. E. E. meetings.

During the coming year a new plan will be tried out experimentally in connection with the Sophomore Orientation program. Heretofore, that program has consisted of a series of lectures by various members of the Institute staff continuing throughout the second term of the sophomore year. Under the experimental plan the program will consist of a brief series of lectures at the beginning of the first term of the sophomore year followed by a series of simple experiments in the various laboratories of the Department during the remainder of the term. It is hoped that this plan may serve as a helpful introduction to the technical instruction in Electrical Engineering which begins in the second term of the sophomore year.

The research program of the Department has been actively continued throughout the year.

The work at Round Hill on local dissipation of fog was discontinued after successful demonstration of the feasibility of clearing a limited area, as for example, a runway on an aviation field or the deck of an airplane carrier. Certain phases of the work on the study of physical properties of fog are, however, being continued by Mr. Houghton under the auspices of the Meteorology Division. This work is being carried on with the generous assistance of Mr. Alan C. Bemis. Mr. Radford has also continued work on the related problem of transmission of infra-red or other signals through fog. Funds for support of this research were made available by the Humane Society of the Commonwealth of Massachusetts.

The research on "blind landing" or "instrument landing" of airplanes sponsored by the United States Department of Commerce, referred to in last year's report, has gone forward under the guidance of Professor Bowles in coöperation with Professor Draper of Aeronautical Engineering. The initial phases of the work were successfully completed and the investigation is to continue another year under the sponsorship of the new Civil Aeronautics Authority.

Professor Barrow's research on transmission of electro-

magnetic waves through hollow pipes and on electromagnetic horns has continued. It now seems probable that the electromagnetic horn may have important application in the blind-landing developments previously referred to.

The Godfrey M. Hymams Trust generously made funds available for constructing the small pressure-insulated million-volt X-ray unit referred to in last year's report. Construction is now substantially complete. The unit will ultimately go to the Massachusetts General Hospital but will be kept at the Institute for some months for experimental study by the staff. A coöperative arrangement with the Hospital was begun during the summer whereby young doctors specializing in radiology spend a number of months working with physicists and engineers in the laboratories of the Institute in order to become more intimately acquainted with the physics and radiation they ultimately will use. The Hospital is also planning to make use of the new radiation source for clinical and biological studies while it is still at the Institute.

Professor Edgerton has continued the development of the technique of high-speed photography and the application of this technique to many important problems. Among others a joint program is now under way with the Biological Department of Harvard University in connection with a study of the flight of insects.

The joint research with the Utilities Coördinated Research, Inc., on insulating oils has continued throughout the year and is to be continued for another year.

Professor von Hippel's research on insulating materials has continued as an important activity of the Department. Several excellent pieces of equipment for this research have been built during the year and several problems are under investigation.

Work on the new Differential Analyzer has made good progress. While some development still remains to be done, a large part of the equipment has been completed and erection has begun in the space provided in the new building. Use of the old Differential Analyzer has in the meantime continued unabated. During the past year nine major projects were carried out, including projects for five different departments of the Institute, one outside university (Harvard) and one commercial organization.

The Cinema Integrator has now been developed to the point where it is available for application to practical problems, and a program is under way of applying it to test problems to develop the full power and technique.

The Network Analyzer was in almost constant use throughout the year, either on graduate research problems or on studies for commercial organizations. During the year several important improvements and additions were made to the equipment. The addition of four new phase shifters brings the generator capacity of the Analyzer to sixteen machines. The development of a new central metering desk, including a new vacuum-tube wattmeter and a central potential panel, and other changes have increased the scope and speed of operation of the unit to a point where it can compete successfully with any of the analyzers more recently developed.

One of the undertakings of the Research Laboratory during the year was the successful design and construction of two modern high-speed cathode-ray oscillographs permitting visual observation and photographic recording of electrical transients of less than 10^{-6} seconds duration. These oscillographs will be very helpful research tools.

Other developments include: a new type of bolometer of very high sensitivity developed by Professor Moon, utilizing the change in resistance of a dielectric with change in temperature; an improved reverberation time meter; a better sound source for acoustic measurements embodying an improved multi-tone generator; and new technique in acoustic impedance measurements.

During the course of the year the staff has shown its usual interest in outside activities. It is represented on 39 committees of national technical societies, has presented 11 papers at major meetings of such societies, and has published 28 articles in technical magazines. A new edition of Professor Woodruff's "Principles of Electric Power Transmission" was published during the year and National Tsing Hua University of China also published (in English) the lectures on Electric Power System Analysis delivered by Professor Wildes while he was a visiting professor there last year.

Professor Laws's book which was published after his death, with the aid of members of the staff who had been closely asso-

ciated with him, is reported by the publishers as being well received.

The pressing need for more space referred to last year has been partially relieved by the assignment to the Department of part of the space in Building 4, formerly devoted to the Heat Laboratory. This will provide for some of the research projects which have been badly handicapped for lack of adequate space, and will also permit expansion of the Communications Laboratory into space now used for the research which will be transferred to the new space. There is still a pressing need for additional office space for the staff. Another major need is for additional modern equipment for the Electrical Measurements Laboratory and the Communications Laboratory to keep those laboratories abreast of recent technical developments.

EDWARD L. MORELAND.

Mechanical Engineering. The Department has made no important changes in the curriculum during the year but it may be noted that the option added last year, designated "Materials and Design," has proved very satisfactory, thanks to the effective coöperation of the Department of Metallurgy. Mechanical engineers with a fundamental understanding of materials seem to be needed in all branches of industry. To permit students to continue graduate study in the field of materials, two new electives were added this year.

A meeting of the New England Foundrymen's Association was held under the Department's sponsorship in April, devoted primarily to problems of control of foundry materials and casting defects. In July a two-day conference on Timber and Concrete was well attended. Such meetings are useful in keeping our own work in touch with industrial requirements and in making it useful to industry.

The Testing Materials Laboratory has been for some time well equipped for undergraduate instruction, but must gradually be supplemented by special apparatus for research. This year we have completed apparatus for the study of combined stress and the investigation of strength theory. New equipment for taking moving pictures of continuous plastic flow has enabled Professor MacGregor, for the first time I believe, to show what happens in welds and in cold rolling.

Professor Keenan's work on steam charts and tables has reached a conclusion by the publication of a table of steam rates, a large scale enthalpy-volume chart and a set of charts giving isentropic drops. This work is sponsored by the A.S.M.E and the three major steam turbine builders.

Professor Schwarz has completed a new testing machine with which to investigate the plastic properties of rayon and other textile materials, apparatus to measure rigidity of yarns, and new equipment for the microscopical analysis of textiles. Work done in the Textile Laboratory under the auspices of the Textile Foundation has formed a large part of the basis for the new Government Wool Top Standards. In view of the exacting demands of modern textile research, it will be recommended that the undergraduate textile option be discontinued and all textile work made of graduate character.

The Automotive Laboratory, besides providing experimental facilities to students in Mechanical and Aeronautical Engineering, has been engaged in a number of research projects financed by others. The titles indicate the nature of the investigations; Dynamics of the Inlet System, A Piston-Ported Two-Stroke Engine, A Crankless Engine, Alcohol Blends as Motor Fuel, Variables which Affect Detonation, A Detonation Indicator, A Cylinder Pressure Indicator. Gifts have been received of engines from the Buick Motor Car Company and the Wright Aeronautical Corporation.

The Air Conditioning Laboratory has been moved into ideal quarters in the basement of the new Building 5, and the opportunity taken to scrap obsolete equipment. Gifts were received of a Smith oil-fired steam boiler, a Utica conditioning unit, Servel compressor, and a number of thermostatic control instruments. Special apparatus is being constructed to demonstrate the fundamental laws of air-water-vapor mixtures.

The Steam Laboratory instead of reporting on new equipment is pleased to record the presentation to Mr. Henry Ford, for his Greenfield Village Museum, of the Brown-Corliss engine which was made in Fitchburg in the early 1880's for the Garrison Street shops of the Institute. This engine is still in excellent running order and will be recalled by many alumni for whom it constituted their first introduction to steam power.

The Lubrication Laboratory has new equipment for the

study of addition agents for oils, including surface tension, oxidation and corrosive effects.

The Heat Measurements Laboratory, by moving into the basement of Building 5, has improved its layout and efficiency for handling the growing number of students using its facilities. A Freon refrigerating unit has been added for use in connection with research on heat losses from surfaces.

The Welding, Forge and Foundry Laboratories have benefited from minor improvements and are in excellent shape. Installation of equipment for the study of stamping, forming, cold rolling and drawing operations has been undertaken in the room formerly assigned to woodworking machinery.

The Machine Tool Laboratory has had many gifts from the industry of tools, cutters, etc., as well as a modern gear-hobbing machine. The Laboratory is evidently useful to the Institute generally, outside of class hours, as 183 persons last year used its equipment for the construction of research and thesis apparatus.

Interest in Course II-A continues in spite of the industrial situation and students seem to be eager to enter the coöperative plan at all times.

Professor de Forest's work on fatigue of metals has led to the development of two types of electro-magnetic vibration machine which show promise of extensive commercial use. A brittle varnish has been made which, when applied to machine parts, cracks under load, thus revealing lines of strain. Strain sensitive bakelite has been used in conjunction with Professor Draper's high-speed oscillograph to measure the stress waves traveling in a gun barrel.

Weekly conferences held by members of the Applied Mechanics teaching staff during the year have proved particularly helpful to the younger men and have indicated the need for some revision of the order of presentation of certain matter.

The Department suffered a great loss in the death of Mr. Franklin Park of the Visiting Committee, whose frequent inspections have done so much to stimulate the staff during recent years. Mr. Park's interest in young engineers entering industry extended to the teachers of these young men. His suggestions are embodied in recent beneficial curriculum changes. It is expected that this Department will for a long time reflect his wise counsel.

J. C. HUNSAKER.

Metallurgy. The year has been essentially one of rearrangement and readjustment both with respect to instruction and equipment. At the suggestion of the Visiting Committee a sharp distinction between Process Metallurgy and Physical Metallurgy will no longer be made and beginning with the Fall Term of 1938 there will be a unified course in Metallurgy. This has meant a slight reduction in time assigned to certain subjects and the dropping of others but it is believed that the new arrangement will equip the students more adequately for later professional work. The number of students has increased to such an extent that the quota limit has been reached for all years. There has also been a gratifying increase in the number of graduate students especially in the Division of Process Metallurgy under Professor Chipman's direction and in the field of Magnetic Research under Professor Bitter.

Because of a generous anonymous gift to the Department a number of much needed changes in equipment have been possible. The Metallography laboratories have been reconstructed to give an additional class-conference room and the necessary microscopes have been added so that two laboratory classes may be held simultaneously instead of the single class which has proved quite inadequate.

The polishing equipment, which has been in service for many years, has been replaced by a modern set of polishing wheels in an enlarged laboratory. Other incidental pieces of equipment have been added so that the Division of Metallography is now thoroughly up to date.

From the same fund several additions to the equipment of the Heat Treatment laboratory have been made. The value of this new material is indicated by its constant use during the summer by graduate students and staff in connection with research problems.

A portable X-ray diffraction outfit has been ordered for the Division of X-ray Metallography and will be ready shortly. This will make possible the examination of metal structures at the place of use and it is expected to add materially to the knowledge of strains in metals.

Professor Chipman has completed the installation of a vacuum-fusion apparatus for the determination of the gaseous elements in steel. This is now in constant use and the results

obtained are in excellent agreement with those accepted by the Bureau of Standards.

A sixty kilowatt motor-generator set has been installed and is in active use in connection with an induction furnace of one hundred fifty pounds capacity for Professor Chipman's researches on the reactions between liquid steel and slag. A vacuum furnace of the same capacity has been built and will be used for the study of slag-metal reactions at low pressures and also for the production and study of vacuum-melted steels.

The laboratory for studying the behavior of metals under the influence of very large magnetic fields has been completed and will be in operation during the coming year. In addition to Professor Bitter's own researches on metals, the equipment will be used by Professor Keyes of the Department of Chemistry in connection with his cryogenic studies and by Professor Harrison of the Department of Physics with his spectrographic investigations.

The Division of Ceramics conducted a successful Summer Session, one week devoted to "The Reactions in Ceramic Materials on Heating," the second week on "The Nature of Glass." These courses attracted many men from the ceramic and glass industries. Researches on "Fine Particle Sizes" and "The Plasticity of Clays" have been continued.

Professor Williams has been appointed Chairman of the Committee on Metallography of the American Society for Testing Materials. (He also organized and conducted the Technical Sessions at the Intersectional Meeting of the American Society for Metals. He spoke before the Boston Section of the A.S.M. on "What is a Physical Metallurgist" and at the Food Technology Conference on "Research in Metallurgy and Its Significance in Canning.")

Professor Waterhouse served as National President of the American Society for Metals and during the year spoke at meetings of the local sections in all parts of the United States.

Professor Chipman has given the following papers: "Evolution of Gases from Rimming Steel Ingots" (joint paper with K. C. McCutcheon before the American Institute of Mining and Metallurgical Engineers); "The Mechanism of Solidification and Segregation in a Rimming Steel Ingot" (joint paper with Anson Hayes before the A.I.M.E.). Dr. Chipman spoke

at Youngstown, Ohio, on "The Application of Thermodynamics to Some Problems of Steel Making"; Boston Chapter, A.I.M.E. on "Gases in Metals"; Boston Chapter, A.S.M. on "Gas Evolution and Segregation in Rimming Steel Ingots," repeated at the Pittsburgh Chapter of the same Society; Buffalo, New York, on "Gas Evolution from Ingots"; and "Temperature Measurements in Liquid Steel" at the Open Hearth Meeting of the A.I.M.E.)

Professor Chipman has served on the Publication Committees of the A.S.M. and the A.I.M.E., is Chairman of the Committee on the Physical Chemistry of Steel Making of the A.I.M.E., and he has just been elected to the Executive Committee of the Iron and Steel Division, A.I.M.E.

Professor Hayward visited the gold, copper and nickel districts of Ontario and Quebec.

Professor Homerberg gave a lecture in Milwaukee on "Nitriding" before that Chapter of the American Society for Metals.

Professor Bitter presented a paper before the American Physics Society on "The New Magnetic Laboratory at M. I. T."

Dr. A. R. Kaufmann, associated with Professor Bitter, also gave a paper before the same Society on "The Measurement of Magnetic Fields and Susceptibilities in Solenoids."

Professor Cohen gave six lectures in the Educational Course sponsored by the American Society for Metals on "Principles of Heat Treatment." He also for the second time gave the University Extension Course in "Metallography and Heat Treatment." The first year the work was taken by 15 students. This past year the attendance has been 52 and a still larger enrollment is expected for the coming year. The results of two years' research will be presented at the fall meeting of the A.I.M.E. in the form of a paper entitled "Age-Hardening of Duralumin." Professor Cohen's earlier paper on the "Aging of Silver-Copper Alloys" has received wide attention and favorable comment. It has been translated in condensed form in French and German technical journals.

ROBERT S. WILLIAMS.

Meteorology. During the year advanced studies in meteorology were pursued by 19 students, including three

Army officers, two Navy officers and three Weather Bureau employees. Three Sc.D. degrees and two S.M. degrees were awarded.

During the last two years, our division, in coöperation with the Bureau of Agricultural Economics and the United States Weather Bureau, has prepared a summary and critical evaluation of various methods of long-range weather forecasting. This phase of our work has been directed by Dr. Willett and the report, which is now completed, will be published as a supplement to the Monthly Weather Review.

In coöperation with the United States Weather Bureau systematic efforts have been made to improve the technique of utilizing the daily aerological observations. This has led to the development of isentropic analysis, which may be defined as a method of determining the structure and flow patterns of the atmosphere with due consideration for the fact that over short periods of time individual parcels of air are constrained to move within surfaces of constant entropy. The principal results of this work are found in the demonstration that isentropic charts are capable of describing the actual movements in the free atmosphere more correctly and suggestively than any of the conventional methods now in use, and in the discovery of certain repeatedly occurring anticyclonic eddy flow patterns. During the summer season these flow patterns change very slowly from day to day, and Mr. Namias has been able to show that they control the distribution of precipitation.

A practical result of our close coöperation with the Bingham Oceanographic Foundation of Yale University and the Woods Hole Oceanographic Institution has been the extension of the technique of isentropic analysis to the oceanographic field, in particular to the movements of the subsurface water off the Grand Banks and in the southern part of the North Atlantic.

In coöperation with the United States Department of Agriculture we are now setting up a small group which will be given the task of developing a basis for five-day weather forecasts. It is our plan to make use of a combination of ordinary synoptic methods, isentropic analysis and statistical methods in the preparation of these experimental forecasts.

In coöperation with the Geophysical Institute in Bergen,

Norway, and the United States Weather Bureau a number of aerological stations will be maintained in the West Indies and in the southeastern United States during the 1938 hurricane season.

Through the generosity of Mr. Alan C. Bemis it has been possible to transfer to our division the fog research carried on in the past by Mr. Houghton at South Dartmouth. Mr. Houghton and his collaborators will devote themselves to a study of the physics of coalescence and precipitation of cloud particles, a field in which very little work has been done in the past.

Dr. Pekeris has reviewed the available literature on ozone in the atmosphere to determine the role of ozone as a connecting link between solar and terrestrial changes. In the upper half of the troposphere, where the moisture content is too low to serve as an identifying agent, regular ozone observations may serve the additional purpose of enabling us to trace air mass movements. The United States Weather Bureau is now embarking on a limited program of ozone measurements and the data thus collected will be made available to Dr. Pekeris for study.

During the year Professor Rossby spent six weeks at the California Institute of Technology as visiting professor. Dr. Pekeris gave a series of lectures at the Yerkes Observatory.

C. G. A. ROSSBY.

Mining Engineering. The Department of Mining Engineering has had a distinguished history both in the quality of the men who have graduated from it and in its contributions to the development of mining enterprise all over the world, especially during the decades when the mineral resources of the world were first being explored by modern methods and great mining companies were in the process of formation. It appears, however, that under the changed circumstances of the present day, the best use of the Institute's facilities in training for the general field of the discovery, recovery and processing of minerals, calls for a change of emphasis and a broader approach. The Executive Committee has accordingly voted to discontinue the present curricula in Mining Engineering in June, 1940.

The members of the Department have been active in

visiting mines and ore dressing plants. Professor Locke went to Sudbury, and the gold fields of Northern Ontario last summer, thereby affording opportunity to see the latest developments both in the milling of gold ores and copper and nickel ores. Professor Mann last September made a trip to the Texas Gulf Coast for the appraisal of petroleum properties for private interests. Messrs. Schuhmann and Schlechten visited ore dressing laboratories in Westport and Stamford, Connecticut, in which studies are being made of settling behavior in classification, thickening, clarifying and related operations. Professor Foster continues, as before, with a group of third year students visiting the iron ore and zinc mines in New Jersey and the anthracite coal region in Pennsylvania.

Research done by students includes much fundamental work under the direction of Professor Locke and Mr. Schuhmann. Among the developments is a continuously operating single flotation cell suitable for use with small quantities of ore. This apparatus allows the maintenance of a constant set of experimental conditions not possible in a batch machine, and hitherto not obtained without a large pilot plant set-up. This equipment is expected to be useful in investigating special problems; in particular, the physical theory of flotation.

The instruction in ore dressing has been revised to include the use of various types of microscopes for the identification of minerals and a brief introduction to the statistical quantitative technique for application of microscopy to ore dressing problems. A preliminary investigation of the statistical method of microscopic analysis, as applied to sized fractions of minerals in the sub-sieve range, indicated that the method commonly used is not basically correct. The results of this investigation confirmed the corrections which were developed mathematically.

Mr. Schuhmann is offering a new subject, Ore Dressing I, beginning next term. This introduces chemical and physical principles which are fundamental and pertinent to flotation.

W. SPENCER HUTCHINSON.

Naval Architecture and Marine Engineering. In view of the present activity in shipbuilding the graduates of

Course XIII have had no difficulty in obtaining positions, and although the course is carrying as many students as the present staff can instruct adequately, it is believed that more graduates might be placed if they were available.

The enrollment in the Course in Naval Construction will be increased materially next year by the addition of one officer of the United States Coast Guard and five officers of the Argentine Navy. Furthermore, it is understood that beginning next summer the quota of student officers in the Construction Corps of the United States Navy will be increased also.

Six members of the Senior Class in the five-year course in Marine Transportation have been placed as engineer cadets on vessels of the Isthmian Steamship Company, the United Fruit Company, and the Standard Oil Company of New Jersey, for the year of sea duty required this year for the first time in their Course. One student was placed as assistant purser on one of the vessels of the American Export Lines.

A graduate Course in Marine Engineering, leading to the Master's degree in Marine Engineering, has been established. Students will be allowed to select their subjects from a wide field of study.

The propeller testing tunnel referred to in last year's report has been financed and has already reached an advanced stage of construction. Funds were contributed by the United Fruit Company, American Bureau of Shipping, Socony-Vacuum Oil Company, United Shipyards, Standard Oil Company of New Jersey, and by Mr. William S. Newell '99. The Bethlehem Shipbuilding Corporation has made a major contribution in the form of labor and material for the structural portion of the tunnel. It is expected that the research facilities of the Department will be enriched materially by the acquisition of this tunnel.

The question of a small towing tank for the Department has been referred to an Institute Committee, appointed in November 1938, for further study and investigation.

The Nautical Museum has been enlarged and rearranged during the year, the principal addition being the whaling exhibit which was lent by Mr. Henry P. Kendall. A model of the Dollar Line *S. S. President Garfield* has also been added. This is the first modern American steamer model in the Museum.

HENRY H. W. KEITH.

SCHOOL OF SCIENCE

Biology and Public Health. The Department has continued to grow in scientific achievement of its objectives, and in response to the constantly expanding recognition of the significance of biological factors in individual welfare and in industry. From the standpoints of sound fundamental instruction and of productiveness in research and public service it has enjoyed a fruitful and successful year.

Although hampered materially by space limitations, the work in the several departmental divisions — in the public health field, in food and fermentation technology, in biochemistry and biological engineering, and in health education — has shown distinct and gratifying progress.

The construction of the new Rogers Building has made possible the release of over two thousand square feet of floor space which has been added to the Department during the summer, and has been converted into laboratories for biological engineering, office-laboratories for four members of the staff, and research rooms for several graduate students. This increase in space will aid greatly in facilitating the rapidly growing work in this new field during the coming year.

There has been effective continuation of the coöperation with other departments in numerous fields of joint interest in Biological and Public Health Engineering and notably in Biochemistry and Biophysics, Food Engineering, Refrigeration, and Air Conditioning. This exchange of services is highly salutary and broadening in its effect, and it is encouraging to note the fine spirit in which these coöperative enterprises are developed.

In addition to those regularly enrolled for degrees, the Department has continued to give instruction to a considerable number of men sent here from numerous State health departments for special training under the Social Security Act, and has thereby rendered service to at least ten States. While the previous training of these students is varied, the acceptance of these students has been worthwhile. Several of them have continued work in the Department after their first appointments, and have become candidates for the Certificate in Public Health.

Two new subjects of prime importance in the instruction in Biological Engineering have been developed. Of these Biophysics was first given in the second term. The other, Biological Engineering, will extend throughout both terms of the academic year. Other new courses, given for the first time during the year just ended, are a summer course on Modern Biology by Dr.Sizer; a course on Germicides and Antiseptics by Dr. Dunn, in which the chemistry and modern technique of these important substances is discussed; and a new graduate course in Public Health Education by Professor Turner. This course, in which forty students were enrolled, attracted not only our own graduate students but also a group from the Harvard School of Public Health, and a considerable number from various other sources. Professor Turner and Dr. Gould have also made a notable change in the course in Industrial Hygiene by introducing some carefully worked out laboratory exercises in the quantitative estimates of industrial poisons.

The work in Water Analysis and in Food Chemistry, taken over from the Department of Chemistry last year, has been transferred to laboratories within the Department, and can thus be conducted with greater effectiveness, as it needs to be closely coördinated with other departmental activities. In their present form these are essentially new courses, as much new material based on recent developments has been introduced.

A seminar course of six discussions on Oxidation-Reduction Phenomena in Biology, given jointly by Drs. Gould andSizer, is also worthy of note here, as it commanded the attention of staff members and graduate students from several departments, and visitors from other nearby institutions. The joint work of these two young men has been fruitful in several fields. With the aid of a research grant from the American Academy of Arts and Sciences they have recently acquired a Warburg-Barcroft apparatus of high sensitiveness (0.05°C) which is to be used in further research on bacterial metabolism, *e.g.*, in the dehydrogenation of sterols and of certain types of foodstuffs by bacteria.

Professor Harris has also been the recipient of a grant from the American Academy of Arts and Sciences for vitamin investigations on human milk.

The Department has received as a permanent loan a new Wallace and Tiernan water chlorinating apparatus for use in teaching.

Several investigations leading to the development of new types of equipment have been carried out during the past year. Professor Horton has made notable studies on impedance and devised new equipment for detecting variations in the electrical properties of living tissue. The cardi tachometer developed earlier has been redesigned and is now used in the clinic in the metabolism laboratory at the Massachusetts General Hospital and in operative surgery at the Lahey Clinic. Professor Horton has also developed a new instrument, the cardioscope, for the continuous observation of cardiac waves by means of the cathode ray oscilloscope. Professor Proctor and Mr. Parker have devised a new fully automatic instrument to be attached to airplanes for the collection of microbes, spores, pollen grains, dusts, etc., from the upper air. This superior equipment will shortly be shown at the meeting of the National Research Council special committee on Aerobiology. The Department wishes to acknowledge with thanks the help which has been given in this work by members of the staff in Meteorology.

The research activity of the Department has been especially gratifying, and justifies our belief that skill in "good teaching" and the ability to conduct careful investigation are attributes which may be simultaneously developed individually and collectively in a department staff. Although the teaching load is above average, practically every member has also been engaged in research, and the output in scientific papers has been numerous and of high quality.

Professor Prescott and Dr. Dunn have in preparation the manuscript of a new volume on Industrial Microbiology, which will serve as a basis for both undergraduate and graduate courses, and Dr. Gould will shortly publish a new Manual of Methods and Procedures in Microbiological Chemistry, the manuscript of which has received highly favorable comment.

Professor Turner, as Chairman of the health section of the World Federation of Education Associations has prepared and contributed largely to a "Health Section Report" of the Tokio meeting in the form of a printed volume of 242 pages.

Of outstanding importance to the work of the Department

was the transfer of Dr. Horton from Electrical Engineering and his appointment as Associate Professor of Biological Engineering. His thorough knowledge of electronics and his skill in invention had already been exhibited in his collaboration with physicians at the Massachusetts General Hospital and elsewhere.

Professor Bunker has been appointed Director of Research Laboratories in Biology. He was granted leave of absence for the first term but returned to his duties in February. Dr. Alfred Korach, a medical health officer of wide experience in Europe, entered upon a year of service as guest investigator in Industrial Hygiene in April.

A very successful Food Technology Conference was conducted by the Department in September, 1937. This was of international character, with speakers of world reputation, attended by more than six hundred representatives of official organizations, food manufacturing companies and scientific and educational institutions. This was the first conference of the kind ever held, and great interest was stimulated. As one outcome of this meeting a national Association of Food Technologists is now under discussion, with excellent prospects that it will shortly be established.

In accordance with the traditional policy, many staff members of the Department have contributed generously to the public service and to the advancement of scientific interests sponsored by the national and international societies. A few only may here be reported.

Professor Prescott is co-president of the Committee on Biology, Chemistry of Food Supplies and Hygiene of the International Institute of Refrigeration, and attended the sessions of the committees of this organization in London and Paris in early July. He is also president of the Delta Omega public health society for the current year. This society includes only the outstanding graduates and staff members of the six professional public health schools in the United States where chapters are located. Other services include the chairmanship of the sub-committee on the Food Control Exhibit at the New York World's Fair, and membership in the Committee on Aerobiology set up by the Division of Biology and Agriculture of the National Research Council.

Professor Turner has not only held the position in the World Federation of Education Associations previously referred to, but is Chairman of the State Committee organized by the Massachusetts State Department of Education to develop a program of study in health for the secondary schools, and is also Chairman of a national committee organized by the American Public Health Association for coördination of health education activities between school departments and public health agencies. Professor Bunker is the referee in the increasingly important problem of methods of evaluation of Vitamin D milks for the National Association of Certified Milk Producers.

Professor Horwood is a member of the Nutrition Advisory Committee of the State Department of Health. He has also prepared a new Sanitary Code for the town of Arlington.

Professor Williams has served as Associate Chief Examiner of the Boston Subsidiary Board of the National Board of Medical Examiners.

Professor Blake is Chairman of the Building and Exhibits Committee of the Museum of Natural History and has also extended and made available to engineers his valuable survey on termites and other wood destroying organisms.

Professor Proctor is Chairman of the Food and Nutrition Section of the American Public Health Association and a member of the committee on Collecting Apparatus in Aerobiology, under the National Research Council.

Professor Jennison is serving the Charles River Association as technical adviser on the pollution of the Basin.

Dr. Dunn has been appointed by the War Plans and Training Office of the Quartermaster General's Office to select properly qualified men for commission in the Food Section of the Quartermaster Reserve Corps.

Mr. Clapp has continued his extremely valuable services in investigation of organisms causing failure in marine piling.

The Department desires to express its thanks to the Wallace and Tiernan Company, to Mr. Charles F. Horan of the Hood Rubber Company, and to the numerous lecturers who have given professional service to the Department.

SAMUEL C. PRESCOTT.

Chemistry. Earlier reports have possibly not emphasized sufficiently the expansion in content and broadened philosophical significance which characterizes the physical chemistry of the present. The subject now bears about the same relation to the great organic body of chemical facts that theoretical physics bears to the world of physical phenomena. Emphasis is indeed especially necessary, for the changes in the subject have taken place at an extremely rapid rate in the past fifteen years, thereby making it difficult to maintain seasoned judgment in those important relationships which the subject bears to the older divisions of chemistry. The other Institute departments have also come to recognize something of the universal significance of modern physical chemistry, and the introduction of the subject in their curriculum combined with the requirements of the students in Chemical Engineering and Chemistry in the subject have put a severe strain on the Department's space and facilities for instruction.

The Department believes its most immediate duty is to urge with every means at its disposal that the plans for additional physicochemical laboratory space formulated last year be carried out. Further postponement of this item of relatively minor expense will mean not alone decreased efficiency and lost time on the part of the students and instructors but enforced withholding of important educational opportunity to a large number of students.

The plans referred to, if carried out, would in addition provide additional facilities for undergraduate organic laboratory instruction, made necessary by the recent introduction of this subject in the curriculum of other courses, and also for the first time provide suitable laboratory space and facilities for senior thesis students in Chemistry.

The course in Physicochemistry Laboratory Instruction has been modernized in the last few years largely through the initiative and devotion of Professor Dietrichson. New equipment has been secured and through the skill and coöperation of our glass blower, Mr. Wayringer, special apparatus for a number of new and fundamental laboratory experiments have been manufactured. If the Institute enrollment be maintained, increased facilities and equipment will be required for the

course in undergraduate laboratory instruction in Physical Chemistry, now operated to capacity.

The trials and problems of first year Chemistry are of course perennial, but great satisfaction is taken in the increased ease and effectiveness of presenting the lectures in Chemistry in the new lecture room in use for the first time during the past year. The addition of a lantern, screens, special charts and additional equipment in the preparation rooms has been made during the year. Under the conditions of use of the lecture room, the students avail themselves of the opportunity of discussion with the lecturer, due to the free period before and after each lecture period.

An item that complicates the first year Chemistry instruction arises from the fact that roughly eight per cent of the entering class has had no previous contact with the subject. It is proposed to meet the problem this year, if necessary, by offering one extra hour per week of voluntary class attendance. The most satisfactory plan would be for all these students to take Chemistry in the summer session preceding entrance. For financial reasons many otherwise well qualified students are unable to do this.

A few years ago this yearly report contained statements about the continued effort which the members of this staff are making to improve the continuity of the Chemistry subjects, leading to a well balanced unit in the School of Science. Progress has been uninterrupted and we believe that the course is now better unified and is in logical sequence from the first year to the last graduate year.

A factor of considerable importance in the proper operation of Course V is the system of electives which has now been in operation long enough to warrant a brief statement. Seniors of the proper intellectual level and bent are encouraged to continue after receiving the Bachelor's degree. A student of preferred qualifications is enabled under the elective system of the third and fourth years to anticipate while an undergraduate certain graduate courses, thereby leaving him in a position to make more effective use of the graduate years of study than would otherwise be the case. By the device of liberal electives and substitution we find it possible to guide the talented student to the stage of scientific maturity without being hampered

by the restrictions imposed by the conventional and on the whole artificial stages of the traditional educational ladder. In this way the acquisition of the Bachelor's degree and the Master's degree are merely minor incidents or extraneous accompaniments, the requirements for which in no way mar the continuity and logical development of a virtually seven-year course: a proper objective in a serious school of science.

Applications for admission for graduate study are embarrassingly more numerous each year. It is evident that students should not be admitted in greater number than can be given the most favorable educational facilities. Prolonged thought has been given to formulating criteria for evaluating the relationship between the number of students and existing staff and facilities. A circumstance of primary importance however lies in the nature of the scientific research in progress or the problems cultivated. Thus, for example, it is possible to select a program of organic (or other) chemical research which will enable a research leader to guide dozens of graduate students using standardized equipment. In this way a showing of "efficiency" may be made. On closer scrutiny, however, it is found that under such a regime graduate students are used to operate a sort of scientific mill, largely in the interest of the professor in charge.*

Assuming, as we do, that the educational advantage of the student is paramount, the choice of problems for research in our Graduate School of Chemistry is guided best, we believe, by consideration of their breadth of scientific significance without special regard for "bull's eye shooting." In this way educational values and sound science are both conserved. Having due regard then for the broad value of the research problems along with available facilities and space, we believe that under present conditions the number of graduate students should not exceed approximately seventy-five. Another topic of more apparent interest in the field of Chemistry is the numerical distribution of graduate students among the recognized branches of Chemistry—inorganic, organic, and physical chemistry. Chemical industry in the United States is a product

* The fact that Nobel prizes in organic chemistry have not gone to Americans is, we believe, connected with the comparative absence of the "mill system" in our universities. In the long run, however, it is believed that a sounder and deeper scientific progress will result from a continuation of present policies in American universities.

of extraordinarily rapid growth and it does not appear wise for several significant reasons to attempt to force an assumed preferential distribution. The policy pursued has been to select the most capable students from the total of the applicants regardless of the branch of Chemistry in which interest is indicated. In this way a natural distribution results which it is believed should not be disturbed. Moreover, in considering the item it is well to keep in the foreground the fact that our objective is to provide a sound scientific education for our students and not narrow scientific specialization. The latter is an impossible task under any conditions in the relatively limited period of graduate study.

For many years Professor Morton has conducted a general course in advanced organic laboratory practice required of all graduate students majoring in Organic Chemistry. The course is unique for the variety of special equipment designed by Professor Morton and executed by Mr. Wayringer. Lately he has published the topics and material of the course in book form, thereby making the apparatus designs, the methods, and quantitative data generally available.

Professor Sherrill has completed in time for issue to the autumn classes a revision of the text in Physical Chemistry, originally the result of collaborative effort with the late Professor Arthur A. Noyes. This unique work in its revised form had the benefit of Professor Noyes' counsel until the last months of his life.

The Cellulose Chemistry unit has continued to gather momentum in the program of research and accumulation of special facilities for this important field of research. The interest of graduate students is manifest and every sign indicates a satisfactory year's progress.

In the field of vitamin and organic peroxide research, progress has moved forward rapidly during the year under Professor Milas' direction in collaboration with Dr. Heggie. Mr. Arthur Harris, supported by a generous fellowship provided by the Massachusetts Pharmaceutical Company, has contributed to the work, particularly on the application side where many interesting possibilities are becoming evident.

The investigations of the group of staff and students in Inorganic and Physical Chemistry have advanced satisfac-

torily. The number of students electing Physical Chemistry has increased substantially in the past two years, and this is desirable since the demand for physical chemists possessing the Ph.D. degree has been insistent for a number of years and far too few have been available. The reaction on the staff of the presence of a full quota of graduate students with enthusiasm for the subject is also very desirable.

During the year further substantial progress in cryogenic or low temperature research should be recorded. A larger quantity of liquid hydrogen (110 liters) was produced* as compared with the previous year, and a number of measurements were carried out with liquid helium down to 1.3°K . The new low temperature technique referred to in earlier reports has also developed further, substantiating the hope of securing greater flexibility, better control, and wider scope of experimentation combined with greater efficiency of refrigeration. Professor Bitter's excellent progress with the completion of the magnetic laboratory will this year make possible measurements of physicochemical interest well below 0.1°K .

The continued satisfaction with the operation of the Teaching Fellowship Plan prompts a brief comment. Not only has every anticipated advantage been realized in the actual operation of the plan but it forms an ideal proving ground for the selection of research associates and instructors, who combine rare and proven qualities of personality and scholarship. The measure of the worth of our Fellows has also been abundantly tested by the seriousness manifested in their conduct of research through the summer instead of preserving an academic year of nine months. We believe heartily in the value of a different ordering and hope ultimately to plan and operate the Department's graduate work on a twelve months basis.

The Visiting Committee took part in an extended meeting with the Department. Most of the discussion centered about the present status of graduate opportunities for the study of organic chemistry, and items connected with future prospects of preëminent contributions in the field. The staff members left the meeting greatly stimulated by the sincere manifestations of interest, the helpful suggestions and practical points of

* The methods of utilizing this low temperature refrigeration make possible a favorable efficiency. At least three times the quantity would have been required using standard methods.

view contributed by the members of the Visiting Committee.

For several years these meetings of the Visiting Committee have been open to all staff members and the writer has noted with satisfaction the developing aptitude of the staff in the difficult art of assimilating and adapting suggestions to specific problems.

Dr. L. J. Haworth, Lalor Fellow* during the past year, resigned in September to accept an attractive professorial opportunity in the Physics Department of the University of Illinois. Dr. Haworth, through his sound scholarship, contributed greatly in our developing low temperature program. Dr. Robert B. Jacobs, recently National Research Fellow in Physics, and Instructor in Physics at Harvard University, has been appointed Lalor Fellow for the year 1938-39. He will carry out investigations in the field of low temperatures.

A welcome contribution to the Department of Chemistry, made by Mrs. Theodore Richards, was a painting by Wilhelm Ostwald dated 1903. This is a valuable souvenir of a distinguished man of science, and intrinsically a significant work of art.

FREDERICK G. KEYES.

General Science and General Engineering. Attracted by its preëminence and traditional background in the fields of science and engineering, a large number of students enter the Institute each year without a definite purpose and objective. Many of the students who do choose one of the standard courses can either give no adequate reason for their choice or base their selection upon false assumptions and inadequate knowledge of the course elected.

An opportunity should always be provided for an early trial and contact with all branches of science and engineering; a contact which may be expected to establish in the student an assurance that by aptitude and interest he should devote his remaining academic years to a particular field of study.

The most important problem confronting every matriculant to college is the selection of the best and most advan-

* The Lalor Foundation has awarded a Lalor Fellowship for four years in recognition of the important service rendered to American science by Professor Arthur A. Noyes in establishing and partly maintaining for many years the Research Laboratory of Physical Chemistry.

tageous field for his life work. The Course IX schedule embodies the spirit of orientation and impresses the student with those factors which should indicate to him the most appropriate professional career.

RALPH G. HUDSON.

Geology. An enrollment of twenty-one graduate students in the Department exceeded in number any previous enrollment in this Department.

The Spectrographic Laboratory, provided by Mr. Godfrey Cabot, has been completed and provides a splendid and much needed facility for research work in economic geology and allied subjects.

Important revisions of the courses in geology were made, involving a reduction in the number of options offered and the combination or consolidation of courses in which a certain amount of duplication had occurred. At the request of the Corporation a course of study in mineral resources was designed and has been accepted by the Faculty.

In addition to their routine teaching and research work the members of the staff have been occupied as follows.

Dr. Waldemar Lindgren continued his editorship of the *Annotated Bibliography of Economic Geology*, and published the tenth volume of this series. Professor Shimer during the summer carried on field work in important localities in northern New England. Professor Slichter continued his research project on the seismic investigation of the deeper layers of the earth's crust. Twelve portable seismographs of new design have been completed and preliminary field tests were made during the summer. Professor Newhouse has given considerable attention to the development of criteria which can be used to determine the direction of solution movement in the formation of ore matrix. Professor Buerger began work on a systematic treatment of crystal pattern analysis. The compilation of a set of tables for reducing the labor inherent in computations of parameters in crystal structure analysis has also been initiated. Professor Morris, who was granted a year's leave of absence for 1937-38, returned to the Institute in the late summer. He carried on geological studies in many countries of

Europe and Asia and in the Pacific islands, and will present a series of lecture seminars on these studies during the coming year. Professor Shrock carried on geological studies in Indiana. Professor Fairbairn was engaged in geological work for the Ontario Department of Mines during the summer. Professor Mead spent the summer months on geological work in the interior of Alaska.

WARREN J. MEAD.

Mathematics. Registration in both undergraduate and graduate mathematical courses was the largest in recent years.

For some time there has been an increasing demand for students trained in mathematical statistics. In fact, that is the field in which we have had greatest difficulty supplying properly qualified graduates. To provide more adequate theoretical and practical instruction in this field a series of courses was arranged to be given coöperatively by the Departments of Mathematics and Economics. Students in Course XVIII who desire to specialize in this field will be permitted to substitute these courses for an equivalent amount of mathematics.

During the year, members of the Department were engaged in research on a large number of problems in applied mathematics, statistics, topology, geometry, and analysis. Professor Hitchcock continued his study of the energy levels of the helium atom and also developed numerical methods for solving algebraic and integral equations. Professor Crout extended methods of graphical stress analysis to certain three dimensional structures. Dr. Wadsworth developed statistical formulas for estimating depreciation of equipment and also coöperated with others in statistical investigations of a biological nature. Professor Struik studied the application of tensor analysis to electrical networks. Professor Franklin continued his investigation of the four color problem. Professor Wiener was concerned with fundamental questions of statistical analysis. He also coöperated with Dr. Pitt of Harvard and Dr. Martin of this Department on further Tauberian Theorems. Professor Cameron studied the distribution of values of the Reimann Zeta function and also coöperated with Drs. Martin and Taylor on functionals of random distributions. Dr. Levin-

son was engaged in research dealing with entire functions and non-harmonic fourier analysis.

Professor Wiener gave the Dohme honorary lecture at Johns Hopkins, the William Lowell Putnam memorial lecture at Harvard, and was one of the invited lecturers at the semi-centennial meeting of the American Mathematical Society. Professor Franklin gave a lecture at the University of North Carolina.

H. B. PHILLIPS.

Physics. The freshman and sophomore instruction in Physics has continued without fundamental change for the last year or two. The lecture groups in the freshman course have been decreased in size, the freshman class being divided into four rather than two sections, a change resulting in more intimate contact between teacher and pupil, made possible by the new lecture room for freshman Chemistry, which has relieved the pressure on the schedule of room 10-250. This move at the same time resulted in additional preparation space for the Physics lectures, materially aiding in the difficult problem of setting up several different experimental lectures in the same day, as is often necessary. The undergraduate schedule of Course VIII likewise has undergone no radical change recently. The Course schedule already contained enough elective time, and few enough separate subjects, to fit in with the recommendations of the committee on the third and fourth year subjects with only trivial revision.

The moving of the high voltage generator from Round Hill to Cambridge, which was mentioned in the last report, has been largely carried out during the present year. The building has been completed to house the high voltage terminals, the apparatus has been completely installed, and only awaits final tests and calibrations before being put in operation. In connection with the move, a fundamental change in design has been introduced, the discharge tube being set vertically from the high voltage terminal to ground, instead of horizontally as at Round Hill, and this has meant rebuilding many parts of the apparatus. The plans for the immediate use of the generator have been revised during the year; instead of using it for the

acceleration of electrons, it is now planned to use it first for the production of neutrons by the acceleration of positive ions, both on account of the importance of neutrons for biological purposes, and because this will provide a practical comparison of the relative advantages of the static machine and the cyclotron in this particular field.

The biological side of the radioactive program of Professor Evans has been expanded during the year by collaboration with members of the Harvard Medical School, assisted by the Milton Fund of Harvard University, in the problem of the absorption of iodine by the thyroid. By producing radio-iodine by neutron bombardment, using a suitable nuclear reaction, and by introducing the radio-iodine into rabbits, it has been possible to get quantitative indications of the concentration of iodine in the thyroid, leading both to valuable knowledge and to the possibility of treating diseased conditions of the thyroid by injections of radio-iodine. The work has been hampered by lack of a sufficiently powerful neutron source. It is hoped that the high voltage generator may soon partly remedy this lack. However, feeling that the biological work which the Department could readily undertake in collaboration with medical institutions would benefit by a large supply of artificially radioactive materials, which are most conveniently supplied in the present state of the art by a cyclotron, Professor Evans has made application during the year for funds for construction of a cyclotron, and has been awarded a grant of \$30,000 by the John and Mary R. Markle Foundation for this purpose. Contracts have already been let for some parts of the project, and it is hoped that the construction can be largely completed during the year 1938-39.

The spectroscopic project of measuring the wave lengths and intensities of the spectrum lines of the elements has continued, with the invaluable assistance of a large grant from the Works Progress Administration. The project has reached a stage where definite plans are being made for publication of a table of 100,000 most important spectral lines of the elements, a great undertaking which will mark a new step in spectroscopy, and which, it is hoped, can be completed during 1939. In recognition of his work in the measurement of wave lengths, Professor Harrison has been made a member and secretary of

the Wavelength Standards Commission of the International Astronomical Union and attended a meeting of this committee in connection with the Stockholm meeting of the Union during the summer of 1938. The sixth Spectroscopy Conference, held during the early summer of 1938, was even more successful than its predecessors.

Professor Warren's research into the structure of glass, by X-ray methods, has been attracting increasing attention in the ceramics industry. To encourage it, a number of the glass companies contributed to a fellowship for the study of glass, which has been occupied during the year. Research in many other fields has been progressing in the Department with interesting and important results.

Professor Mueller has been on leave of absence during the year, having been awarded a fellowship by the John Simon Guggenheim Memorial Foundation. He spent most of the year in Cambridge, England, with visits to Switzerland, Sweden and numerous other places. Professor Nottingham was on leave during the second half year, at the Research Laboratory of the General Electric Company at Schenectady. On account of his absence, his conference on electronics, which has been held at the Institute for several years, was transferred for this year to Schenectady. There have been several guests of the laboratory during the year, on leave from other institutions, who have brought stimulation to the Department from outside. These included Professor Dorothy Weeks of Wilson College, Professor C. N. Wall of North Central College, Professor F. W. Warburton of the University of Kentucky, Professor A. T. Waterman of Yale University, and Professor C. E. Howe of Oberlin College.

JOHN C. SLATER.

SCHOOL OF ARCHITECTURE

Architecture. As this report is completed the School of Architecture moves into its new quarters in Cambridge, thus terminating the physical separation of the School from the Institute that has existed since 1916.

The leaving of the Rogers Building was accomplished with fitting ceremonies on Alumni Day. Perhaps the outstanding

feature of this occasion was a particularly well arranged and effective retrospective exhibition of the work of architectural students since the establishment of the School. The significant part that the building had played in the distinguished past of the Institute itself, the notable individuals with whom it had been associated, as well as of the twenty and more years during which it had been the home of the School of Architecture received generous recognition.

A repetition of the Interschool Problem that was referred to in the last report characterized the first term of the new year. Technology's designs were recognized by the other participating schools as offering by far the best solutions to the problem under consideration, "An Aquarium."

Conscious of the changing requirements that characterize current practice, certain members of the Visiting and Advisory Committees united in sending out a questionnaire to some forty or more architects throughout the country in an effort to learn what was thought of our present teaching policy and methods, the adequacy of our alumni's equipment to meet future architectural needs, and the extent to which our graduates measured up to the professional, administrative, and educational opportunities of the day.

This study applied particularly to those who have graduated since 1918. The responses formed the chief topic of discussion at the meeting of the two above committees in February. A careful summary and analysis of the answers indicated a substantial approval of our curriculum and policy, and further showed that, wherever good work was being done and competent leadership existed, Tech men were certain to be in the vanguard. Constructive criticism recommended closer acquaintance with materials and with the sciences, both of which suggestions have been anticipated by changes made in our curriculum two years ago.

A committee, composed of those members of the staff in charge of teaching graduate students and of which Professor William H. Lawrence was chairman, was appointed to study methods of widening the scope of our graduate work. As a result of their recommendation, seminars will be held at regular intervals under the direction of experts in such fields as acoustics, illumination, construction, materials, etc., for the purpose

of discussing the application of such specialized knowledge to current graduate problems in Design. Coöperation from those familiar with these particular fields of study has already been assured.

A first attempt to feel out the attitude of contractors and manufacturers of building materials, with a view to securing their coöperation with architectural offices in providing summer openings for our students, met a most gratifying response. The idea will be further developed and, if possible, organized in the course of the coming year.

It is with great regret that the termination of Course IV-A, Architectural Engineering, is announced and with it the retirement of Professor William H. Lawrence from the active teaching at the Institute which he started in 1891 and has continued with ever-increasing effectiveness. His judgment, his unfailing coöperation, and the truly inspired quality of his teaching have endeared him to many generations of architectural graduates.

As was the case last year, one of our students was the winner of the prize offered by the Boston Society of Architects to the student in the Harvard and Technology Schools of Architecture offering the best solution for a "Concourse at an Airport at the New York World's Fair."

Gifts to the Architectural Library during the year were: Books and slides from the library of Mr. Edwin K. Lewis, M. I. T. 1881, given to the Library by his sisters, Misses Marion K. and Bertha R. Lewis. City Planning slides were given by Dr. Thomas Adams.

The School approaches the opportunities provided by the new building with confidence in the future, encouraged by the spirit of friendly coöperation that the administration has shown and by the excellent conditions and closer relations with the other branches of Technology that this change affords.

WILLIAM EMERSON.

City Planning. As the fields of City Planning and Housing continue to expand and receive increased recognition from the public at large it is essential that close contact be maintained with recent developments in techniques and administration. This is especially true of the field of housing where

so much activity has followed the creation of the United States Housing Authority, and the success with which this contact has been possible during the past year has been due largely to the coöperation received from the departmental library and to a continuance of the policy of having visiting experts in the professional fields of City Planning and Housing lecture at regular intervals. The School was fortunate in having two series of lectures included in the 1937-38 schedule by the eminent British experts, Sir Raymond Unwin and Dr. Thomas Adams, the latter of whom is also serving as Research Consultant.

The course in City Planning Practice has recently completed its first year of operation and the results so far indicate that a coöperative course in City and Regional Planning can be successfully developed where there exist well organized planning commissions with competent technical supervision. No difficulties were encountered in the selection of research projects which had a close relationship with the work of the city and state planning agencies coöperating in the program and two such projects have already been completed with mutual benefit to the planning commissions and to the students undertaking the work. The commissions coöperating were the Boston City Planning Board and the Massachusetts State Planning Board.

During the past five years the ratio of graduates to undergraduates in the City Planning Course has shown a steady increase and it is interesting to note that, although a majority of the graduate students came with Bachelor's degrees in Architecture, a considerable number of the candidates for the degree of Master in City Planning received their undergraduate training in the fields of Landscape Architecture or Civil Engineering.

As the relationship between the professions engaged in the various aspects of community development is such an important element in a comprehensive planning program, it was with much satisfaction that the students and staff of the City Planning Course coöperated with the senior class in the Department of Business and Engineering Administration in a collaborative problem, an experience which proved both pleasant and profitable. It is believed that the additional opportunities for this type of collaboration made possible by closer personal contact will be one of the most valuable benefits to be derived from the move to the new building. FREDERICK J. ADAMS.

Drawing. During the year the Section of Drawing has done further experimental work in the field of aids to the visualization of space problems. The development of the possibilities of the stereoscope has progressed satisfactorily. A set of three dimensional views illustrating the fundamental principles of descriptive geometry has been developed from the experience of the past two years. These will be at the disposal of the students and available for classroom work during the coming year. The value of this material is being established by the fact that students tend to use it of their own volition if it is readily available.

Research work in the uses of stereoscopic drawings in other scientific fields and in improved methods of making such drawings is also being carried forward. Since this is a comparatively new subject in drawing the Section takes pride in establishing itself as a pioneer in the field.

The Section is also giving increased attention to closer coöperation with other Departments in order that the student may find drawing ability a more immediately valuable tool in his work at the Institute. It is hoped that this will impress upon him the value of the subject as an aid to thought and analysis in all fields of engineering. In the coming year greater emphasis is to be laid on sketching and the development of a more accurate sense of proportion as it is felt that these are indispensable aids in the solution of metrical problems in other subjects.

JOHN T. RULE.

DIVISION OF HUMANITIES

Economics and Social Science. The most noteworthy features of the work of the Department during the past year have been: the diversification of our program to cope more adequately with the increased teaching obligations of the five-year plan and the Sloan Fellowships; the extension of coöperation in various projects with other departments of the Institute; the multiplication of our contacts with industry and government; the progress of research activities in the fields of statistics and labor.

An Industrial Relations Section under the leadership of

Professors Maclaurin and Brown has been organized; the special labor library is now in full operation and requests for bibliography are coming in. The Section has just finished a study of the workers' attitudes toward layoff and seniority, which is shortly to be published. This study has demonstrated the wisdom of coöperation in the field of social science, of bringing the techniques of the sociologist and psychologist to supplement and correct the analysis of the economist. In conjunction with the Federal Bureau of Labor Statistics, the Section is now engaged in an investigation of employment by age groups in New England industry with a view to obtaining data on productivity, accident rate, sickness, and so forth. This investigation is being conducted largely by Dr. Palmer and Mr. Brownell. The addition of Dr. Arensberg to the staff completes the personnel of the Section. Further researches are being planned, and an industrial relations conference is being organized for November.

Our statistical work has been developed during the past year. In conjunction with the Department of Mathematics we are offering a new course in laboratory statistics, and the Mathematics Department is organizing two new courses in insurance statistics in which we are coöperating. In September the two Departments called a conference on engineering and industrial statistics, which was attended by one hundred twenty delegates chiefly from industrial concerns. This conference, the first of its kind in this country, was devoted chiefly to a discussion of the control of the quality of manufactured products. Its success, indicated by the enthusiasm of a large attendance, was due to the efforts of Mr. H. A. Freeman and Dr. Wadsworth. During the year these men conducted a seminar in statistics at which students from various Departments presented their statistical problems. We believe that this field offers great promise for development and that it is one for which the Institute is especially well adapted. In fact, judging from the number of requests for statistical assistance that have already been received from business organizations, we are likely to be faced with a serious drain on the time and energies of our staff.

The introduction of a new course in applied psychology, offered during the summer, met with an encouraging response.

Professor McGregor's general studies in psychology have been well received and an increasing amount of his time is being taken up in interviews with students having problems of personal adjustment to discuss. We have continued our monthly articles in Mechanical Engineering and have thoroughly revised both volumes of our textbook, "The Economic Process."

The Department will miss Professor Burdell who proved a helpful colleague and a stimulus to the extension of our activities in sociological and allied fields.

RALPH E. FREEMAN.

English and History. In January Professor Pearson felt it necessary because of poor health to relinquish his responsibilities as Head of the Department. As Professor Emeritus, however, he continues his wholehearted interest, and his never-failing encouragement is a source of pleasure and inspiration to members of the staff.

No major changes in the curriculum have been made this year. Our efforts have been directed toward improving subject matter and methods of teaching in the options which were introduced two years ago. We are trying to present both literature and history by more interesting means than textbooks. The success of our attempt will depend to a great extent upon our ability to develop adequate library facilities.

With Colonel Thomas-Stahle's assistance a member of the Department has prepared a new General Study in the Military History and Policy of the United States which he will give to students in the advanced course in Military Science. A General Study in Public Speaking was again offered during the second term and for the first time during the summer session. The response proved that many of our students desire training in oral composition beyond that which we can give them in the regular options.

Some members of the Department have been active in research or writing for publications; other members have spoken frequently over the radio and before various organizations. At the December meeting of the American Historical Association, Professor Bridenbaugh received gratifying recognition when his manuscript, "Cities in the Wilderness: The First Century

of Urban Life in America, 1625-1742" was awarded the Justin Winsor Prize. It will be published this fall. We wish him every success in his new position as Associate Professor of History at Brown University.

HOWARD R. BARTLETT.

General Studies. The year has been one in which the various problems connected with General Studies have received a good deal of notice from both the Administration and the Faculty. The fact that some of these problems remain unsettled does not detract from the value of the discussions which have been carried on. Dr. Burdell, who was Chairman of the General Studies Committee, directed thought and attention to this extremely important phase of our educational program. Dr. Burdell feels that we should continue to examine the General Studies curriculum as a means of furthering desirable educational objectives. He emphasized the importance of the humanities in engineering education and the desirability of bringing the various parts of this field into their proper relationships with each other. I think it will be granted that, irrespective of one's opinion as to the relative amount of attention that should be devoted to such studies at the Institute, much is to be gained by viewing the field of the humanities as an inter-related whole. Only by so doing can we avoid duplication and ensure that our energies are being used to the best advantage.

I have to report the addition of various new subjects such as Psychology in Industry, History of Music, Public Speaking, Development of Community Planning and Introduction to International Relations. It seems desirable that our list of offerings should be constantly revised with a view to keeping it in line with changes in the interests of our students and teachers. Having available a large staff highly trained in many fields, it should be possible to keep our curriculum alive and fresh.

During the year a questionnaire was sent to instructors of General Studies subjects, requesting information as to the manner of conducting classes and seeking an expression of opinion as to objectives and possible changes in scheduling. Though there was considerable difference of opinion on some

points, there was almost unanimous agreement as to the adequacy of our present conception of general studies as being "subjects of a general and essentially non-vocational character which are offered for the purpose of giving the student an opportunity to broaden his education . . . designed to introduce him to fields of thought and interests outside of his chosen professional work." The information gathered should prove useful to the Committee in considering future changes in the organization or content of the General Studies program.

RALPH E. FREEMAN.

Military Science and Tactics. During the year a careful study of the courses in Military Science has been made with a view to more nearly equalizing the overload on Advanced Course students, and to make the requirements for commissions in the various branches more nearly the same. The result is a revised schedule which has been adopted and which is, I think, a decided improvement over previous schedules.

Another important course change which has been made is that the Course MS98, Military History and Policy of the United States, will, in the future, be taught as a General Study, by the Department of English and History. This course was offered as a General Study for many years, then was made a departmental subject. I consider this change proper and desirable.

Considerable thought has been given to making the Basic Course more interesting and to adding incentive. Freshmen come to the Institute with widely varying military backgrounds. Some have had no training whatever. Others come from military schools where they have had excellent military training. Naturally the latter are apt to receive higher marks even though they may do very little work. To add incentive for the man with no previous training who works hard, the Order of Military Merit, a decoration awarded for effort rather than present knowledge, has been inaugurated. The ribbons of the order were awarded at a suitable ceremony in May this year and will be so awarded each year.

As usual the work of the rifle team has been excellent. It won twelve of its fifteen matches, won the New England Inter-

collegiate Championship, and was second in the Hearst Trophy Match. It has been felt for many years that the work in rifle marksmanship given the Freshmen was inadequate but it has been limited by the facilities available. If and when the new Gymnasium is completed and additional facilities become available, it is planned to expand this work considerably. This will doubtless increase interest in the Basic Course and certainly will result in better trained personnel from the War Department view point.

As a result of efforts made during the year, the War Department quota for training in the Advanced Course has been increased from the 215 of last year to 285 for the coming year. Even this greatly increased quota will permit the acceptance of only about one-half of the applicants to take the Advanced Course and efforts will be continued to secure a still larger quota next year.

As usual, all units of the Department were rated as excellent by the Corps Area Inspectors.

C. THOMAS-STAHLE.

Modern Languages. In the past year the Department has endeavored to carry out as far as possible the recommendations made by the Visiting Committee in its last report. To stimulate and satisfy a wider interest in foreign languages it has organized a Cercle Francais and a German Language Club. The activities of the former consisted of six meetings at which French films were shown and talks in French were given on French institutions, art movements and writers. The collaboration of one of our graduate students, Monsieur Raymond Samuel, of the French Consul, Monsieur François Brière, and of Mrs. E. K. Rand of the Cambridge French Talking Films deserves a special word of appreciation. In the German Group, the committee, with Mr. Koch as Chairman, had the kind cooperation of the Glee Club for the contributions of German songs. Four meetings were held offering illustrated talks in German on technical education, industries, sports, etc., in the various German-speaking countries. The activities of both groups were enthusiastically supported by Dean Burdell and a number of the Faculty outside the Department. The attend-

ance was surprisingly large (as many as 150 at one meeting), giving ample proof of the interest in foreign languages, literatures and institutions. With the success of these two clubs demonstrated, the Department is planning the creation of a Spanish club along similar lines. The arrangements for the programs of these meetings have drawn very heavily on the slender budget of the Department which could use to advantage a liberal allowance as soon as available.

Other new features of our work were the brief lantern talks in French and Italian given by Dr. Macerata to the French and Italian classes, and the experiments in phonograph voice recording made by the staff and a limited number of students. These records have had the effect of making students conscious of imperfections in speech habits, not only in the foreign languages but also in their English. We hope to carry much farther this interesting line of work, and expect to obtain from it valuable results.

In addition to the normal number of books purchased annually, the French collection has been considerably increased by the gift of a large number of valuable standard works presented by the French Government through its Ministère des Affaires Etrangères, and it is with deep gratitude that we mention this most generous token of the interest and friendship of France.

In the work of requiring students to select as part of their program scientific articles of personal interest in French and German for written translation we have had the gracious coöperation of Department Heads, the Central Library staff and the librarians of the departmental libraries, particularly Mrs. Lane of the Vail Library.

The total number of students in the Department has increased slightly but steadily since 1934: 325, 343, 354, 360, as of November in each year. German naturally has shown the greatest growth: 226 in November, 1934, to 251 in 1937. French, although dropped from the requirements in Course IV, and although required by our rules in but few cases, has not declined seriously: 86 in 1934, 82 in 1937. The opportunities for our students to take Spanish and Italian are, of course, very limited, but Spanish has held its own very well, and Italian had the largest enrollment (11) since 1930 (15). In the General

Studies given by the Department in the first term 30 were enrolled, a large proportion of whom were of high scholastic standing.

During the year our Department acted as host for one of the meetings of the Deutsche Tafelrunde, Boston Chapter of the American Teachers of German. Our Dr. Currier is president of the local organization.

It is a pleasure to record the interest shown and the help given by Dean Burdell, and it is with sincere regret that we learn he is leaving us to accept a call elsewhere.

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, 1938, as well as the financial transactions during the fiscal year ended on that date.

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

Capital Gifts

Estate of Charles Hayden, for Endowment	\$1,000,000.00
Godfrey L. Cabot, for Solar Energy Research	647,700.00
Pierre duPont, for special purposes	25,000.00
Coleman duPont Estate (additional)	4,551.89
F. W. Emery Estate (additional)	250.00
A. F. Estabrook Estate (additional)	1,800.00
J. W. Foster Estate (additional)	8,485.09
Babson's Statistical Organization, for Prizes	10,000.00
H. A. Nevins Estate (additional)	297.46
Edward Mallinckrodt, Jr., for Wright Memorial Wind Tunnel	5,000.00
Curtis-Wright Corp., for Wright Memorial Wind Tunnel	7,500.00
W. A. M. Burden, for Wright Memorial Wind Tunnel	10,000.00
F. B. Rentschler, for Wright Memorial Wind Tunnel	10,000.00
Contributions to Alumni Fund	256,873.03
The John and Mary R. Markle Foundation for Cyclotron	30,000.00
Estate of Abby W. Hunt (additional)	4,000.00
Estate of H. H. Logan (additional)	2,455.20
Mrs. Clarissa H. Thomson for Elihu Thomson Professorship	5,000.00
Anonymous to Educational Endowment	50.00
Everett Westcott Estate (additional)	2,000.00
Marion Westcott Estate (additional)	500.00
Estate of Francis H. Williams, for Endowment	102,064.18
Estate of Henry C. Frick, for Endowment (additional)	720.00
	\$2,134,246.85

Miscellaneous Gifts

Contributions of Research Associates	\$35,050.00
Contributions to Industrial Relations Fund	42,100.00
Contributions to Propeller Testing Fund	15,000.00
Anonymous for Cosmic Terrestrial Research	19,200.00
Genradco Trust, for Research	16,800.00
Anonymous for Bess Bigelow Fund	15,000.00
Anonymous for Metallurgy	10,000.00
Anonymous for Tree Planting	3,720.00
Anonymous for W. B. Rogers Relief Fund	1,000.00
Anonymous for Albert Fund	5,000.00

Humane Society of Massachusetts, for Research	\$2,500.00
Research Corporation for Fellowship	700.00
Research Corporation for Research	6,500.00
Professor and Mrs. William Emerson, for City Planning	1,666.67
Redfield Proctor, for Fellowship	1,500.00
E. I. duPont deNemours Co., for Fellowship	750.00
Alfred P. Sloan Foundation, for Fellowship	1,000.00
Phelps-Dodge Corporation, for Fellowship	1,350.00
L. J. and M. E. Horowitz, for Building Construction Course	5,000.00
Rockefeller Foundation, for Salaries and Research	5,500.00
Milton Fund of Harvard, for Iodine Research	2,000.00
Contributions to Glass Industry Research	1,500.00
Geological Society of America, for Salaries	5,776.75
Emergency Committee in Aid of German Scholars	1,500.00
G. M. Hyams Trust, for Research	10,000.00
C. Lillian Moore Estate, for Grimmons Fund	2,257.72
Samuel Cabot, for Chemical Engineering Department	200.00
Contributions to Industrial Relations Library	300.00
Contributions, Friends of the Library	90.00
Contributions to Research, Business and Engineering Administration	200.00
H. R. Staley, for R. F. Tucker Memorial Fund	200.00
Contributions to Sailing Pavilion and Trophies	75.00
	\$213,436.14
Total Capital and Miscellaneous Gifts	<u>\$2,347,682.99</u>

PLANT

The complete withdrawal of the Institute from the City of Boston was effected by turning over the keys of the Rogers Building on June 28, 1938, and as a result, for the first time, the Institute's balance sheet shows no holdings in Boston except for certain real estate investments.

The new addition to the main building on Massachusetts Avenue, housing the Architectural Department as well as certain other departments, is well along and will be available for use at the opening of the Institute year.

Early in May the Institute stopped making its own electric power, having concluded a satisfactory arrangement with the Cambridge Electric Company to furnish power needed for its increasing educational and experimental needs. The Power Plant will continue to furnish heating and high pressure steam and for these purposes is entirely adequate for some years to come.

The work on the new Wright Memorial Wind Tunnel is progressing favorably; the new Magnetic Substation is practically complete and the High Voltage Project brought up from Round Hill has been finished and in operation for some time.

The former Riverbank Court Hotel, purchased in December 1937, is being completely renovated and refurnished and will be ready for occupancy as a Graduate House in September.

At this writing, plans for the removal of the present athletic field and track to the land west of Massachusetts Avenue with provisions for a new Field House as well as plans for the new swimming pool and other athletic facilities are going forward rapidly.

OPERATION

SUMMARY OF OPERATING INCOME AND EXPENSE

	1937-38	<i>Per Cent of Total</i>
Income from Students	\$1,505,400	50%
Income from Investments	1,284,300	43
Income from Other Sources	218,800	7
	\$3,008,500	100%
Academic Expenses	\$2,035,900	67%
Administration Expenses	323,500	11
Plant Expenses	337,600	11
Miscellaneous Expenses	319,900	11
	\$3,016,900	100%

The sum of \$28,000 was withdrawn from the recently established Income Equalization Reserve Fund and applied to current income. Expense for the year exceeded income by \$8,400, but gains from previous years' operations served to offset this and, as a result, the year closes with a current surplus of \$1,359.03.

ENDOWMENT FUNDS

The Book Value of the Endowment Funds, \$35,567,839, shows a net increase of \$842,084. The total received from capital gifts was \$2,134,200, largely on account of the Hayden and Cabot bequests; withdrawals from the Eastman Building and other Funds for new building construction and other projects were in excess of \$1,100,000.

INVESTMENTS

Another year of heavy investment turnover is recorded — purchases and sales running over \$8,000,000, something less than 25 per cent of the list. Government Bond holdings have been reduced, Public Utility bonds show a considerable increase, Railroad Bonds, a decrease of 3 per cent to 7.7 per cent of the total. Our Common Stock position has been maintained and the other items show little change in totals.

SUMMARY OF INVESTMENTS, JUNE 30, 1938

GENERAL INVESTMENTS	<i>Book Value</i>	<i>Market Value</i>	<i>Per Cent at Market</i>
Bonds — U. S. Government	\$4,963,838	\$5,023,100	15.4
Canadian Government	810,790	875,730	2.7
Industrial	583,586	600,200	1.8
Public Utility	5,799,031	6,057,320	18.5
Railroad	3,273,796	2,493,220	7.7
Other	1,030,234	828,600	2.6
	<u>\$16,461,275</u>	<u>\$15,878,170</u>	<u>48.7</u>
Preferred Stocks — Industrial	\$868,674	\$879,500	2.7
Public Utility	986,495	916,430	2.8
Railroad	80,024	24,000	.1
	<u>\$1,935,193</u>	<u>\$1,819,930</u>	<u>5.6</u>
Common Stocks — Industrial	\$8,384,360	\$10,397,110	32.1
Public Utility	1,394,382	1,235,500	3.8
Railroad	365,740	206,950	.6
Bank	1,742,106	1,132,130	3.7
Other	723,991	607,870	1.8
	<u>\$12,610,579</u>	<u>\$13,579,560</u>	<u>42.0</u>
Mortgages and Real Estate	\$1,408,497	\$1,137,511	3.7
TOTAL — GENERAL INVESTMENTS ..	<u>\$32,415,544</u>	<u>\$32,415,171</u>	<u>100.00</u>
TOTAL — SPECIAL INVESTMENTS .	<u>\$2,657,211</u>	<u>\$2,284,485</u>	<u>...</u>
TOTAL — ALL INVESTMENTS	<u>\$35,072,755</u>	<u>\$34,699,656</u>	<u>...</u>

INVESTMENT INCOME

Sharp dividend reductions during the last half of fiscal 1938 reduced income below budget estimates, but it was possible to allocate to the pooled funds a 4.55 per cent yield against 5 per cent last year. The yield on all investments based on market value was 4.45 per cent (4.63 per cent last year).

TECHNOLOGY LOAN FUND COMMITTEE

September 1, 1938.

Executive Committee
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Sirs:

I desire to submit a report of the Technology Loan Fund Committee for the fiscal year ended June 30, 1938, with a statement of receipts and disbursements for previous years, together with statement showing how the balance of the Fund is now constituted.

All transactions for the year have been covered by the regular Institute audit.

The present holdings are shown under Special Investments, page 166.

Respectfully submitted,

TECHNOLOGY LOAN FUND COMMITTEE

Karl T. Compton, *Chairman*

Gerard Swope

Pierre S. duPont

John E. Aldred

Edwin S. Webster

Horace S. Ford

TECHNOLOGY LOAN FUND — RECEIPTS AND DISBURSEMENTS

	<i>Total from Oct. 1930 to June 30, 1937</i>	<i>Fiscal Year Ended June 30, 1938</i>	<i>Total June 30, 1938</i>
SUBSCRIPTIONS:			
Cash.....	\$1,282,426.43	.....	\$1,282,426.43
Securities.....	153,293.75	.....	153,293.75
Total Subscriptions.....	\$1,435,720.18	.....	\$1,435,720.18
Income Received.....	159,252.61	\$37,103.64	196,356.25
Net Profit on Sales.....	42,417.69	19,869.38	22,548.31
Total Receipts.....	\$1,637,390.48	\$17,234.26	\$1,654,624.74
Remitted to M.I.T. for Loans...	702,812.00	6,115.86	708,927.86
Repayments and Interest from Students in Excess of Loans for 1936-37.....	(25,860.17)	.....	(25,860.17)
Balance of Fund.....	<u>\$960,438.65</u>	<u>\$11,118.40</u>	<u>\$971,557.05</u>
Investments (p. 166).....			\$957,166.15
Cash.....			14,390.90
¹ Net Loss			<u>\$971,557.05</u>

M. I. T. 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, 1938

<i>Assets</i>	
Cash.....	\$42,476.22
Investments (p. 138).....	1,202,052.09
Total.....	<u>\$1,244,528.31</u>

Liabilities

Teachers' Annuity Fund (5% salary deduction, plus interest) .	\$679,293.37
*M. I. T. Pension Fund (3% appropriation, plus interest) . . .	436,087.78
Special Reserves for Annuity Payments	104,966.15
Total Liabilities	\$1,220,347.30
Reserve Fund (surplus)	24,181.01
Total	\$1,244,528.31

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

Investments, M. I. T. Pension Association

<i>Par Value</i>			<i>Book Value</i>
\$100,000 U. S. Treasury	3 $\frac{1}{4}$ s	1945-43	\$107,445.56
100,000 U. S. Treasury	4s	1954-44	112,220.00
150,000 U. S. Treasury	3s	1948-46	157,248.00
40,000 U. S. Treasury	3 $\frac{1}{8}$ s	1952	42,375.00
16,000 Scovill Mfg.	5 $\frac{1}{2}$ s	1945	15,840.00
35,000 Alabama Power	5s	1946	36,085.00
50,000 Appalachian Elec.	4s	1963	49,375.00
30,000 Bell Tel. of Pa.	5s	1948	31,809.00
10,000 Cedars Rapids M. & P.	5s	1953	10,000.00
50,000 Central N. Y. Power	3 $\frac{3}{4}$ s	1962	50,060.00
50,000 Detroit Edison	4s	1965	53,948.00
29,000 Miss. River Power	5s	1951	29,333.00
40,000 N. Y. Power & Light	4 $\frac{1}{2}$ s	1967	39,499.62
50,000 Atch. Top. & S. Fe	4 $\frac{1}{2}$ s	1948	54,828.00
25,000 Atlantic Coast Line	4s	1952	24,753.15
25,000 Balt. & Ohio	4s	1948	25,197.00
25,000 Can. Pacific Eq.	5s	1944	25,285.00
50,000 Chicago Union Station	3 $\frac{3}{4}$ s	1963	52,821.00
40,000 Kansas City Term	4s	1960	41,804.00
35,000 Penn. Co.	4s	1963	36,603.00
35,000 Southern Pacific	4s	1955	33,638.79
<i>Shares</i>			
600 General Electric Co.			35,530.54
300 Standard Oil, N. J.			21,090.18
200 Union Carbide & Carbon			20,015.08
300 United Fruit			23,847.66
200 United Shoe Mach.			17,340.00
150 Am. Tel. & Tel. Co.			26,560.51
500 First National Bank, Boston			27,500.00
			\$1,202,052.09

The market value of these securities as of June 30, 1938, was \$1,142,900.

CHARLES B. BREED
KARL T. COMPTON
HORACE S. FORD

RALPH E. FREEMAN
PHILIP STOCKTON
Trustees.

Respectfully submitted,

HORACE S. FORD,
Treasurer.

September 15, 1938

SCHEDULE A
FINANCIAL RESULT OF OPERATION FOR YEAR ENDED JUNE 30, 1938

	<i>Operating— Budget</i>	<i>Other— Non-Budget</i>	<i>Total</i>
Total Income and Receipts (Schedule B)	\$3,008,530.06	\$4,153,717.48	\$7,162,247.54
Total Expenditures (Schedule C)	3,016,899.83	3,285,395.99	6,302,295.82
Excess Expense, Budget Operation	\$8,369.77		
Excess Income and Receipts, Non-Budget Operation — Added to Funds		\$868,321.49	
Net Excess Income and Receipts Total Operation			\$859,951.72
Profit and Loss balance from previous years' operation (Schedule S), Gain	9,015.44		
Total Available for Increase of Current Surplus (Schedule S)	\$645.67		

SCHEDULE B
INCOME AND RECEIPTS FOR YEAR 1937-1938

<u>INCOME FROM STUDENTS:</u>	<i>Operating Income Budget</i>	<i>Other Income and Receipts Non-Budget</i>	<i>Total</i>
(a) Tuition Fees	\$1,451,804.03		
Locker, Examinations and Other Fees	7,571.59		
Dormitories (Net), Schedule B-1	45,995.25		
	\$1,505,370.87	.....	\$1,505,370.87

INCOME FROM INVESTMENTS:

Total (Schedule M)	\$1,284,272.84	\$262,773.28	\$1,547,046.12
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INCOME FROM OTHER SOURCES:

Federal Aid from Acts, 1862-90	\$22,088.35		
Contributions (Schedule B-2) .	16,416.67		
Appropriations (Schedule B-4) .	133,707.74		
Miscellaneous (Schedule B-3) .	46,673.59		
	\$218,886.35		\$218,886.35

CURRENT FUNDS INCOME:

Total (Schedule R)		\$539,387.32	\$539,387.32
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ENDOWMENT FUNDS ADDITIONS:

Total (Schedule M)		\$3,351,556.88	\$3,351,556.88
TOTALS (Schedule A)	\$3,008,530.06	\$4,153,717.48	\$7,162,247.54

(a) TUITION FEES — Cash, Institute Year 1937-38	\$1,055,019.82		
Cash, Summer Session 1937	115,060.53		
Fees Receivable	973.18		
Undergraduate Scholarships	78,564.00		
Graduate Scholarships and Awards	93,724.50		
Technology Loan Fund, Loans	104,212.00		
Emerson Fund, Awards	4,250.00		
Total	\$1,451,804.03		

SCHEDULE C
EXPENDITURES FOR YEAR 1937-1938

<u>ACADEMIC EXPENSES:</u>	<i>Operating Expense Budget</i>	<i>Other Expenditures Non-Budget</i>	<i>Total</i>
Salaries of Teachers (C-1)	\$1,631,830.33		
Accessory to Teaching (C-1)	63,896.62		
Laboratory Service (C-1)	135,213.37		
Department Expenses (C-2)	137,809.26		
General Library (C-3)	67,157.50		
	\$2,035,907.08	.....	\$2,035,907.08
 <u>ADMINISTRATION EXPENSES:</u>			
Salaries, Officers	\$94,350.00		
Clerical Staff (C-4)	83,834.35		
Expenses, Offices (C-5)	36,557.42		
Bulletins and Publicity (C-6)	12,929.52		
General Expense (C-7)	95,804.39		
	\$323,475.68	.....	\$323,475.68
 <u>PLANT EXPENSES:</u>			
Building Service (C-8)	\$118,339.91		
Power Plant Operation (C-9)	92,043.50		
Fire Insurance (Net)	3,083.65		
Repairs and Alterations (C-10)	124,124.52		
	\$337,591.58	.....	\$337,591.58
 <u>MISCELLANEOUS EXPENSES:</u>			
Department of Hygiene (C-11)	\$50,380.10		
Camps 1937 (C-12 and C-13)	6,452.59		
*Undergraduate Budget Board Operations (Schedule C-14)	75,671.39		
Special Appropriations (C-16)	187,421.41		
	\$319,925.49	.....	\$319,925.49
 <u>CURRENT FUNDS; EXPENDITURES:</u>			
Total (Schedule R) . . . . .	.....	\$513,150.22	\$513,150.22
 <u>ENDOWMENT FUNDS; EXPENDITURES:</u>			
Total (Schedule C-17) . . . . .	.....	\$2,772,245.77	\$2,772,245.77
 TOTALS (Schedule A)			
	\$3,016,899.83	\$3,285,395.99	\$6,302,295.82

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

SCHEDULE B-1
DORMITORY OPERATION (Net)

Income:

Rentals	\$152,719.35	
Miscellaneous	2,733.76	
		\$155,453.11
Less Refunds	\$6,023.87	
Dormitory Tax Allowance	3,105.00	
		9,128.87
		\$146,324.24

Expense:

Salaries	\$47,610.49	
Laundry	3,340.36	
Light, Heat, Power and Water	18,044.51	
Repairs	17,236.83	
Supplies (less inventory \$2,663.80)	2,394.68	
Printing, Adm., Telephone, etc.	2,631.46	
New furniture and equipment	3,070.66	
Interest on Mortgage Loan (M.I.T.)	6,000.00	
		100,328.99
Net Income, Schedule B		\$45,995.25

SCHEDULE B-2
CONTRIBUTIONS FOR TEACHING AND RESEARCH

General Electric Co. for Course VI-A	\$3,750.00
Boston Edison Co. for Course VI-A	2,500.00
L. J. & M. E. Horowitz Foundation for Building Constructing Course	5,000.00
Mr. and Mrs. William Emerson for City Planning Course	1,666.67
Rockefeller Foundation for Electrical Engineering	2,000.00
For Displaced German Scholars for Electrical Engineering	1,500.00
	\$16,416.67

SCHEDULE B-3
MISCELLANEOUS INCOME

Division of Laboratory Supplies	\$5,357.65
Account of U. S. Navy, Torpedo Research	1,637.19
From Trustees H. C. Frick Estate	3,168.42
Sale of Lecture Notes	790.79
Rentals and Miscellaneous	7,719.54
From Income Equalization Reserve Fund	28,000.00
	\$46,673.59

SCHEDULE B-4

APPROPRIATIONS FROM FUNDS FOR TEACHING AND RESEARCH
BY DEPARTMENTS

Aeronautical Engineering				\$5,390.00
N. A. W. No. 467	\$1,440.00	No. 1343	1,500.00	
N. A. W. No. 472	600.00	No. 1333	500.00	
Blind Landing Res.	1,350.00			
Biology				19,225.00
Underwood Fund	\$1,000.00	Rockefeller Found.	3,800.00	
Alba Fund	675.00	Health Educ.	1,000.00	
Genradco	5,500.00	Res. Corp'n.	250.00	
Sedgwick Fund	7,000.00			
Business and Engineering Administration				2,450.00
Teachers Fund	\$2,450.00			
Chemistry				13,850.00
Richards Fund	\$600.00	A. D. Little Fund	1,500.00	
Chem. Found.	11,000.00	Mass. Pharm. Asso.	750.00	
Chemical Engineering				7,900.00
Richardson Fund	\$2,000.00	Appr. No. 1207	1,000.00	
A. D. Little Fund	2,200.00	Fuels Res.	200.00	
Cabot Fund	2,500.00			
Civil Engineering				6,850.00
Whitney Fund	\$2,600.00	Teachers Fund	4,250.00	
Economics				4,412.18
Indus. Rel. Fund	\$4,412.18			
Electrical Engineering				23,968.23
Blind Landing Res.	4,420.00	Genradco Trust	1,560.00	
Fog Research	875.00	Grimmons Fund	3,000.00	
Assoc. Ed.Co.Acct.	5,663.31	Network Analy.	1,560.00	
Rock.Diff.Analy.	5,819.92	Rapid Selection	70.00	
		No. 1219	1,000.00	
Geology				11,200.00
Whitney Fund	\$6,000.00	Bureau of Agri.	1,000.00	
Professors' Fund	1,200.00	Geol. Soc. of Am.	3,000.00	
Humanics				5,361.52
Nickerson Fund	\$5,361.52			
Library				2,725.67
Vail Fund	\$2,059.17	Cilley Fund	666.50	
Mechanical Engineering				8,233.36
Industrial Fund	\$5,900.00	Textile Res.	400.00	
Air Cond. Res.	1,933.36			
Metallurgy				1,800.00
D. I. C.	\$600.00	No. 1337	600.00	
Penrose Fund	600.00			
Physics				8,449.16
Age of Earth Res.	\$1,633.36	Nuclear Res.	2,182.50	
Glass Indus.	2,000.00	No. 1288	800.00	
Milton Iodine Res.	1,833.30			
Research Associates Fund to Various Departments				11,892.62
Total, Schedule B				<u>\$133,707.74</u>

SCHEDULE C-1
SALARIES OF TEACHERS, ACCESSORY TO TEACHING
AND LABORATORY SERVICE

<i>Department</i>	<i>Teachers Salaries</i>	<i>Wages Accessory to Teaching</i>	<i>Wages Laboratory Service</i>
Summer Session, 1936.....	\$70,440.61	.....	.....
Aeronautical Engineering.....	74,790.03	\$2,860.84	\$6,204.09
Architecture.....	65,135.00	4,338.68	2,300.00
Biology and Public Health.....	61,735.60	1,499.34	2,565.00
Business and Eng. Administration...	57,694.50	4,148.38	.....
Chemistry.....	174,850.00	6,402.35	13,763.10
Chemical Engineering.....	79,790.50	4,247.15	3,899.61
Chemical Engineering Practice School	14,665.00	.....	.....
Civil Engineering.....	109,350.00	4,054.99	3,683.61
Division of Laboratory Supplies.....	.....	.....	22,254.00
Drawing.....	24,900.00	312.00	.....
Economics.....	48,812.18	2,794.72	.....
Electrical Engineering.....	172,119.69	9,274.45	16,448.88
English and History.....	62,165.00	855.00	.....
General Eng. and General Science...	1,500.00	435.00	.....
General Studies.....	2,150.00	*.....	.....
Geology.....	53,550.00	2,183.98	2,399.80
Humanics.....	5,000.00	*.....	.....
Lantern Operation.....	.....	.....	1,719.99
Mathematics.....	63,870.00	1,046.66	.....
Mechanical Engineering.....	179,943.36	8,020.00	19,958.34
Metallurgy.....	70,100.00	1,720.00	9,569.99
Military Science.....	7,370.00	1,038.00	.....
Mining.....	29,250.00	2,634.68	.....
Modern Languages.....	17,900.00	296.80	.....
Naval Architecture.....	40,550.00	1,621.28	1,746.09
Physics.....	144,198.86	4,112.32	28,700.87
Totals (Schedule C).....	<u>\$1,631,830.33</u>	<u>\$63,896.62</u>	<u>\$135,213.37</u>

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

SCHEDULE C-2
DEPARTMENT EXPENSES (Net)

<i>Department</i>	
Aeronautics	* \$5,000.00
Architecture	6,145.29
Biology	* 3,200.00
Business and Engineering Administration	* 3,827.77
Chemistry	17,623.94
Chemical Engineering	* 8,930.61
Chemical Engineering Practice School	7,900.00
Civil Engineering	* 2,598.41
Drawing	259.31
Economics	* 1,458.30
Electrical Engineering	* 19,954.65
English and History	337.71
General Engineering and General Science	90.86
General Studies	376.80
Geology	* 2,400.00
Humanics	361.52
Mathematics	471.35
Mechanical Engineering	* 16,761.84
Metallurgy	* 4,864.00
Military Science	1,347.62
Mining	1,796.27
Modern Languages	270.00
Naval Architecture	* 882.05
Physics	* 30,482.73
United States Army and Navy Officers	468.23
Total (Schedule C)	<u><u>\$137,809.26</u></u>

SCHEDULE C-3
GENERAL LIBRARY

Salaries of Officers	\$14,494.00
Wages, Office and Clerical	34,443.50
Expenses	* 18,220.00
Total (Schedule C)	<u><u>\$67,157.50</u></u>

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

SCHEDULE C-4**WAGES, CLERICAL STAFF, ADMINISTRATION OFFICES**

President and Vice-President.....	\$5,352.44
Dean of Humanities.....	1,560.00
Dean of Science.....	941.34
Dean of Students.....	2,040.00
Registrar.....	25,765.46
Director of Admissions.....	10,819.44
Treasurer and Bursar.....	23,124.15
Superintendent.....	7,584.00
News Service.....	1,023.70
Undergraduate Scholarship and Loan Fund Board.....	5,623.82
Total (Schedule C).....	<u>\$83,834.35</u>

SCHEDULE C-5**EXPENSES, ADMINISTRATION OFFICES**

President and Vice-President.....	\$2,546.67
Dean of Humanities.....	267.47
Dean of Science.....	139.39
Dean of Students.....	735.36
Registrar.....	11,591.03
Director of Admissions.....	3,429.88
Bursar.....	5,074.94
Treasurer.....	874.54
Superintendent.....	1,182.96
Register of Former Students.....	4,001.16
News Service.....	927.18
Undergraduate Scholarship and Loan Fund Board.....	3,039.31
Graduate School and Scholarship Committee.....	531.80
New Student Publicity Account.....	2,215.73
Total (Schedule C).....	<u>\$36,557.42</u>

SCHEDULE C-6**BULLETINS AND PUBLICITY**

Advertising — M. I. T. Publications.....	\$815.86
Printing — President's and Treasurer's Reports.....	1,262.00
Directory.....	791.00
Summer Session 1937.....	2,717.34
General Catalogue.....	7,343.32
Total (Schedule C).....	<u>\$12,929.52</u>

SCHEDULE C-7**GENERAL EXPENSE**

Allowances.....	\$24,000.00
Pensions.....	13,400.00
Workmen's Compensation and General Liability Insurance, etc.	7,070.54
Taxes, Cambridge.....	7,416.97
Auditing.....	1,500.00
Dues, Fees, etc.....	2,620.84
Receptions, Graduation.....	6,657.23
Trucking of Mail.....	1,123.88
Travel.....	8,619.03
Telephone Service.....	23,116.36
M. I. T. Service Accounts (Net).....	279.54
Total (Schedule C).....	<u>\$95,804.39</u>

**SCHEDULE C-8
BUILDING SERVICE**

Shop Foremen (net).....	\$3,272.50
Janitors: Supervisory and Staff.....	42,890.81
Night Cleaners.....	30,653.52
Watchmen (including Cambridge Police).....	13,490.06
Window Cleaning.....	7,823.55
Heating and Ventilation.....	9,934.66
Mail, Elevators, Shipper, Stock Room, Matron, Messenger....	10,274.81
Total (Schedule C).....	<u>\$118,339.91</u>

**SCHEDULE C-9
POWER PLANT OPERATION (Net)**

Fuel Oil.....	\$73,558.85
Edison Steam Service.....	3,750.00
Water.....	2,854.80
Supplies.....	3,369.47
Repairs.....	4,600.25
Salaries.....	23,116.66
Power Purchased (Cambridge).....	4,803.46
Power Purchased (Boston).....	2,093.28
Total.....	<u>\$118,146.77</u>
Less Transfers and Credits.....	26,103.27
Total (Schedule C).....	<u>\$92,043.50</u>

**SCHEDULE C-10
REPAIRS, ALTERATIONS AND MAINTENANCE**

Buildings 1, 2, 3, 4, 5, 6, 8, 10, 11.....	\$52,163.76
Rogers Building, Boston.....	554.76
Buildings No. 30, 31, 33, 35, 36, 38, 46 and all others.....	8,728.51
President's House.....	7,282.59
Furniture.....	3,960.09
Elevators.....	2,370.52
Mains and Conduits.....	6,823.20
Water.....	9,207.51
Gas.....	2,115.50
Grounds, Roads, Tennis Courts, etc.....	24,298.59
Building Protection.....	948.73
Rubbish.....	2,198.36
Undistributed (net).....	3,472.40
Total (Schedule C).....	<u>\$124,124.52</u>

SCHEDULE C-11
DEPARTMENT OF HYGIENE

Salaries, Staff		\$20,875.00
<i>Expense:</i>		
Clinic, Salaries	\$8,592.58	
Medical and Other Supplies	1,744.86	
Office Supplies	200.87	
X-Ray Operation	2,259.42	
Repairs	123.28	
Physical Examinations	3,374.52	
		16,295.53
<i>Expense:</i>		
Infirmary, Salaries	\$8,478.32	
Extra Nursing	816.00	
Equipment	708.46	
Food (net)	1,425.28	
Laundry	1,625.91	
		13,053.97
Miscellaneous		155.60
Total (Schedule C)		\$50,380.10

SCHEDULE C-12
CIVIL ENGINEERING SUMMER CAMP (1937)
TECHNOLOGY, MAINE

*Income from Students, Staff and miscellaneous	\$3,425.04
*Expense	8,790.89
Caretaker	\$1,440.00
Repairs and Equipment	1,782.06
Administration Taxes, Insurance, Travel	2,201.92
Wages, Provisions and Supplies, Operating	3,366.91
Net Expense	\$5,365.85

SCHEDULE C-13
MINING ENGINEERING SUMMER CAMP (1937), DOVER, N. J.

*Income from Students and Staff	\$914.37
*Expense	2,001.11
Administration Repairs and Equipment	\$726.74
Caretaker	360.00
Provisions and Supplies, Operating	914.37
Net Expense	\$1,086.74
Total Expense of Camps (Schedule C)	\$6,452.59

* Tuition Receipts and Staff Salary Payments included in Summer Session, pp. 140 and 144.

SCHEDULE C-14

UNDERGRADUATE BUDGET BOARD OPERATIONS

Sailing Pavilion and Activities	\$5,448.78
Boathouse, Maintenance	5,441.76
Launches, Maintenance	2,555.48
Athletic Field, Maintenance	7,583.91
Walker Memorial (excluding Dining Service) (Net)	17,427.46
Undergraduate Dues	20,314.00
Athletic Coaches Salaries	16,900.00
	\$75,671.39

SCHEDULE C-15

DINING SERVICE

Inventory, June 30, 1937	\$8,097.85
Expenses	155,251.21
Food	\$86,610.79
Salaries	47,814.25
Light, Heat, Power, Water	4,389.55
Laundry	3,054.13
Equipment	2,626.00
Repairs	1,478.54
Printing, Administration, Insurance	3,000.51
Occupancy	2,000.00
Carried to Dining Service Reserve	4,277.44
Total Expense	
	\$163,349.06

Income	\$155,491.25
Sale of Coupon Books (Net)	\$83,492.94
Cash	71,998.31
Inventory, June 30, 1938	7,857.81
	\$163,349.06

SCHEDULE C-16
SPECIAL APPROPRIATIONS

Graduate Students and Staff Tuition Awards.....	\$35,607.00
Pension and Insurance Plan — Staff.....	72,453.80
Insurance Plan — Employees.....	4,683.42
Society of Arts.....	2,119.47
Tau Beta Pi Awards.....	2,000.00
President's Fund.....	2,000.00
No. 1294 Power Plant Survey.....	2,401.91
1391 and 1413 Athletic Adv. Council.....	300.00
Musical Clubs, Coaching and Concert.....	525.00
Nos. 1306, 1329, 1344 Museum Committee.....	7,500.00
New Equipment.....	2,467.05
Publicity.....	8,795.75
Honoraria.....	1,000.00
Tech Review to Schools and Clubs.....	2,060.00
Alumni Day.....	1,000.00
Open House.....	1,093.00
Research Reports, etc.....	2,143.06
Summer Session 1937.....	899.69
News Bulletin in Review.....	600.00
Aeronautical Engineering.....	7,209.20
Navy Vibration Research.....	1,513.01
Shop Course.....	400.00
Hurricane Research.....	1,500.00
Flying Instruction.....	496.19
Travel.....	300.00
Vibration Research.....	1,000.00
Meteorology.....	1,500.00
Alcohol and Gasoline Research.....	500.00
Biology and Public Health.....	3,700.00
Food Research.....	2,200.00
No. 1310 Research.....	1,500.00
Business and Engineering Administration.....	1,117.35
No. 1332 Fellowship Program.....	
Chemical Engineering.....	1,870.00
No. 1207 Research.....	1,000.00
1331 Research.....	420.00
1375 Colloid Symposium.....	200.00
1421 Research.....	250.00
Civil Engineering.....	4,380.20
Soil Mechanics Lab.....	1,000.00
Structural Lab.....	1,000.00
Cement Research.....	1,250.00
No. 1392 Structural Lab.....	630.20
1409 Salaries.....	500.00
Economics.....	450.00
No. 1266 Salaries.....	

SCHEDULE C-16 — (Continued)
SPECIAL APPROPRIATIONS

Electrical Engineering.....		\$13,373.26
Nos. 1182, 1276 Salaries.....	2,200.00	
Course VI-A Travel.....	1,000.00	
Diff. Analyzer.....	2,400.00	
No. 1348 Mt. Evans Research.....	223.26	
1342 Navy Fog Res.....	3,550.00	
1269 Radio Survey Res.....	1,000.00	
1334 Research.....	3,000.00	
Geology.....		750.00
No. 1394 Lighting.....	250.00	
1355 Travel.....	500.00	
Library.....		73.00
No. 1378 Special.....		
Mechanical Engineering.....		3,200.00
No. 1366 Dynam. Res.....	1,200.00	
1308 Int. Cong. App. Mechanics.....	2,000.00	
Metallurgy.....		6,420.00
No. 1354 Research.....	500.00	
1393 Magnetic Res.....	1,500.00	
1242 Space.....	1,120.00	
1289, 1337 Salaries.....	3,300.00	
Naval Architecture.....		500.00
No. 1377 Towing Tank Design.....		
Physics.....		3,520.00
Spectroscopy Conference.....	2,500.00	
No. 1291 Salary.....	520.00	
1290 Scholarship.....	500.00	
TOTAL SPECIAL APPROPRIATIONS (Schedule C).....		<u><u>\$187,421.41</u></u>

SCHEDULE C-17

¹ ENDOWMENT FUNDS, EXPENDITURES

General, Restricted.....	\$820,882.95
Eben S. Draper, for Expenses.....	407.00
Eastman Building Fund, for New Construction	764,816.67
M. I. T. Alumni Fund, for Drive Expenses ...	50,000.00
Edwin A. Wyeth, for Annuity, Taxes, and Expenses	5,659.28
General, Unrestricted.....	265,111.12
Edmund D. Barbour, for Equipment.....	117,000.00
Arthur F. Estabrook, for Equipment.....	5,800.00
Pierre du Pont, for Research.....	5,000.00
George Wyman Hamilton, for Equipment ...	24,048.62
Abby W. Hunt, for Equipment.....	12,000.00
Industrial, for Research.....	12,042.01
H. H. Logan, for Equipment.....	7,200.00
Moses W. Oliver, for Equipment.....	11,220.49
Preston Player, for Equipment.....	20,000.00
Charles O. Prescott, for Equipment.....	25,800.00
Ellen V. Smith, for Equipment.....	25,000.00
Special Deposit and Agency Funds.....	1,394,130.84
² Endowment Reserve, for care and losses (gross)	
a/c sales of securities.....	342,739.57
Income Equalization Reserve, for Current Income	28,000.00
Albert, for Student House Expense.....	1,862.59
New Building Fund, for New Construction ...	967,283.33
Class Funds ('23-'25) for Insur. Premiums ...	363.71
Class '28 End. Fund, Loan Refund.....	88.20
Industrial Relations, for Research.....	10,500.00
M. I. T. Teachers Ins. for Ins. Premiums, etc..	28,611.31
M. I. T. Teachers Ins. Special, for Annuities..	5,994.65
H. A. Morss Nautical, for Sailing Activities...	200.00
Professors', for Salary.....	1,303.17
Rockefeller (balance), written off.....	80.00
Schwarz Memorial, for Map Room.....	4,388.74
Lillie C. Smith, for Student Aid.....	60.57
Technology Matrons Teas, for Teas.....	440.00
Undergrad. Dues Reserve Athletics, for Exp...	2,215.00
Library Funds.....	9,992.23
Walter S. Barker, for Books.....	454.52
Frank Harvey Cilley, for Walker Library.....	3,466.50
Charles Lewis Flint, for Books.....	240.30
Ednah Dow Cheney, for Margaret Cheney Room	590.39
William Hall Kerr, for Books.....	74.38
George A. Osborne, for Books.....	395.98
Arthur Rotch Architectural, for Books.....	225.18
John Hume Tod, for Books.....	100.81
Theodore N. Vail, for Vail Library.....	2,059.17
Friends of the Library for Kayser Coll., etc. ..	2,385.00

¹ Other than Transfer of Income for Current Purposes.² Gross gains a/c sales of securities \$169,223. on page 171.

SCHEDULE C-17—Continued

¹ ENDOWMENT FUNDS, EXPENDITURES

Department Funds		\$42,015.83
Frank Walter Boles Memorial, for Arch.	218.75	
Crosby Honorary, for Geology	200.00	
A. D. Little Memorial (Trans. to Income)	2,329.40	
John Lawrence Mauran, for Architecture	479.75	
Metallurgy, for Research	8,980.00	
Forris Jewett Moore, for Chemistry	10,353.66	
William E. Nickerson, for Humanics	5,361.52	
Edward D. Peters, for Mineralogy	64.40	
Pratt Naval Arch., for Nautical Museum and Annuities	2,447.70	
W. T. Sedgwick, for Biology	7,000.00	
Edmund K. Turner, for Annuity and Taxes ..	2,080.65	
William Lyman Underwood, for Biology	2,500.00	
Research Funds		47,534.36
Samuel Cabot, for Chemical Engineering	2,500.00	
Ellen H. Richards, for Chemistry	633.86	
Charlotte B. Richardson, for Chem. Eng.	2,000.00	
Rogers, for Expenses	578.84	
Solar Energy, for Research	3,500.00	
Edward Whitney, for Civ. Eng. & Geology ...	16,875.00	
Textile Research, for M. E. Dept.	400.00	
Wright Memorial Wind Tunnel, for New Construction	21,046.66	
Fellowship Funds		8,892.20
For Fellowships	8,850.00	
For Expenses	42.20	
Scholarship Funds		56,173.33
For Scholarships and Loans	56,139.00	
For Expenses	34.33	
Prize Funds		922.77
For Prizes	922.77	
Relief Funds		126,590.14
Edward Austin, for Graduate Schol.	20,000.00	
Edward Austin, for Trav. Fellowship.	1,500.00	
Miscellaneous Funds, for Undergr. Sch.	22,500.00	
Jonathan Whitney, for Graduate Schol.	21,412.50	
Jonathan Whitney, for T. C. A.	5,200.00	
Jonathan Whitney, for Expenses	3,459.00	
Tech Loan Fund, for Loans and Expenses ...	27,180.64	
Coffin Memorial, for Expenses	33.00	
J. A. Grimmons, for Elec. Eng.	5,000.00	
Frances and William Emerson — Student Aid.	4,550.00	
Deans, for Student Loans	965.00	
Bursar's, for Student Loans	1,550.00	
W. B. Rogers, for Special Awards	2,000.00	
Summer Surveying Camp for Student Loans ..	240.00	
Teachers Fund, for Retiring Allowances	11,000.00	
Total (Schedule C)		<u>\$2,772,245.77</u>

¹ Other than Transfer of Income for Current Purposes.

SCHEDULE D
TREASURER'S BALANCE SHEET
JUNE 30, 1938

ENDOWMENT FUNDS, ASSETS

Securities and Real Estate (Schedule H)	\$35,072,755.74
Advanced — Graduate House	70,305.24
Cash: For Investment (Schedule D-3)	424,778.50
Total	<u>\$35,567,839.48</u>

STUDENT LOAN ASSETS

Notes Receivable (Schedule P)	\$787,219.40
Total	<u>\$787,219.40</u>

CURRENT ASSETS

Cash: For General Purposes (Schedule D-3)	\$156,980.19
Accounts Receivable (Schedule D-1)	77,461.51
Students' Fees and Deposits, Receivable	1,289.40
Deposit on Fire Insurance Account	39,997.12
Advances and Inventories for 1937-38 (Schedule D-2)	83,471.26
Total	<u>\$359,199.48</u>

EDUCATIONAL PLANT ASSETS

Land, Buildings, and Equipment (Schedule J)	\$15,229,150.15
Cash: for New Construction (Schedule D-3)	603,241.16
Total	<u>\$15,832,391.31</u>
Total Assets	<u>\$52,546,649.67</u>

AGENCY FUNDS, ASSETS

Securities, Hewett Fund (Schedule H-1)	\$210,441.10
Cash: Hewett Fund	715.19
¹ Cash: Student Deposits	26,604.03
	<u>\$237,760.32</u>

¹Held for safekeeping only.

SCHEDULE D
TREASURER'S BALANCE SHEET
JUNE 30, 1938

ENDOWMENT FUNDS, CAPITAL

Endowment Funds (Schedule M)	\$35,567,839.48
Total	<u>\$35,567,839.48</u>

STUDENT LOAN CAPITAL

Total (Schedule P)	\$787,219.40
Total	<u>\$787,219.40</u>

CURRENT LIABILITIES

Current Funds (Schedule R)	\$257,111.50
Accounts Payable	9,680.22
Students' Fees and Deposits (Schedule D-4)	91,048.73
Current Surplus (Schedule S)	1,359.03
Total	<u>\$359,199.48</u>

EDUCATIONAL PLANT CAPITAL

Endowment for Educational Plant	\$15,832,391.31
Total (Schedule K)	<u>\$15,832,391.31</u>
Total Capital and Liabilities	<u>\$52,546,649.67</u>

AGENCY FUNDS, CAPITAL

Joseph Hewett Fund	\$211,156.29
¹ Student Deposits	26,604.03
	<u>\$237,760.32</u>

¹ Held for safekeeping only.

SCHEDULE D-1
DETAIL OF ACCOUNTS RECEIVABLE

Chemical Foundation, a/c Div. Ind. Coöperation.....	\$22,000.00
Chemical Foundation, a/c Cellulose Research.....	24,066.08
Nat. Adv. Committee on Aëronautics.....	3,950.00
U. S. Dept. of Commerce, a/c Blind Landing Research.....	12,000.00
U. S. Navy, a/c Research.....	3,750.00
Division of Industrial Coöperation Accounts.....	5,073.25
Miscellaneous Accounts.....	6,622.18
Total (Schedule D).....	\$77,461.51

SCHEDULE D-2
DETAIL OF ADVANCES AND INVENTORIES FOR 1937-1938

Summer Session Salaries and Expenses Advanced.....	\$4,621.52
Salaries Advanced, 1938-39.....	2,800.00
Civil Engineering Summer Camp 1938, Advanced.....	619.55
Department Overdrafts.....	1,002.05
Premiums Paid on Unexpired Insurance.....	4,396.25
Inventories — Notes held by Coöperative Society and M.I.T.	2,634.10
Dormitory Supplies.....	2,663.80
Dining Service, Food, Utensils, etc.....	7,857.81
Fuel Oil.....	1,480.78
Liquid Soap.....	73.28
Walker Memorial Games, Candy, Cigars, etc.	341.27
Letter Shop Supplies.....	607.43
Stamps.....	150.84
Building and Janitors' Supplies.....	2,220.26
Stock Room: Pipe, Fittings, Lumber, Hardware,	
Paint, Oil, Glass and Miscellaneous Supplies.	14,730.42
Photographic Service, Supplies.....	2,199.52
Division of Laboratory Supplies: Chemicals,	
Glassware, Platinum, etc., also Office Supplies	35,072.38
Total (Schedule D).....	\$83,471.26

SCHEDULE D-3**TOTAL CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR**

Total Cash Receipts	\$13,610,570.95
Total Cash Disbursements	13,004,229.99
Excess of Receipts	\$606,340.96
Cash, June 29, 1937	578,658.89
Cash, June 30, 1938 (as below)	<u>\$1,184,999.85</u>

CASH BALANCE

Cash for Investment — on Deposit (Schedule D)	\$424,778.50
Cash for New Construction — on Deposit (Schedule D)	603,241.16
Cash for Current Purposes (Schedule D)	
On Deposit	\$153,743.75
In Office	3,236.44
	<u>156,980.19</u>
Total Cash	<u>\$1,184,999.85</u>

SCHEDULE D-4**STUDENTS' FEES IN ADVANCE, AND DEPOSITS RETURNABLE**

Tuition Fees, Summer Session 1938	\$71,585.67
Students' Deposits Returnable	4,759.67
Students' Deposits, Summer Session 1938	5,513.65
Dormitory Rentals, Summer Session 1938	7,467.75
Deposits, Civil Engineering Camp 1938	1,721.99
Total (Schedule D)	<u>\$91,048.73</u>

¹Exclusive of Agency Funds.

SCHEDULE H
INVESTMENTS — GENERAL

<i>Par Value</i>	U. S. GOVERNMENT BONDS			<i>Book Value</i>	<i>Net Income</i>
\$ 300,000	U. S. Treasury.....	1 $\frac{3}{8}$ s	1939	\$301,031.25	\$7,431.31
1,000,000	U. S. Treasury.....	3 $\frac{1}{4}$ s	1941	1,074,000.00	32,500.00
1,000,000	U. S. Treasury.....	3 $\frac{1}{4}$ s	1945-43	1,074,600.00	32,500.00
750,000	U. S. Treasury.....	3 $\frac{3}{8}$ s	1943-40	795,453.43	22,617.19
1,000,000	U. S. Treasury.....	3 $\frac{3}{8}$ s	1943-41	1,072,800.00	33,750.00
600,000	U. S. Treasury.....	3 $\frac{3}{8}$ s	1947-43	645,953.25	18,243.81

Income from bonds sold, called or matured		76,174.78
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<i>Total U. S. Government Bonds</i>	\$4,963,837.93	\$223,217.09
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CANADIAN GOVERNMENT BONDS					
\$250,000	Canada.....	2 $\frac{1}{4}$ s	1944	\$249,322.50	\$5,625.00
220,000	Canada.....	5s	1952	218,740.82	11,000.00
150,000	Ontario.....	5s	1942	150,495.00	7,500.00
50,000	Ontario.....	6s	1943	51,124.00	3,000.00
35,000	Ottawa.....	5s	1940	35,000.00	1,750.00
35,000	Ottawa.....	5s	1945	35,000.00	1,750.00
1,000	Ottawa.....	6s	1938	1,000.00	60.00
8,000	Ottawa.....	6s	1939	8,000.00	480.00
8,000	Ottawa.....	6s	1940	8,000.00	480.00
24,325	Toronto.....	4s	1948	22,622.25	973.32
23,000	Toronto.....	5s	1939	22,655.00	1,150.00
9,000	Toronto.....	5s	1942	8,830.80	450.00
<i>Total Canadian Government Bonds</i>				\$810,790.37	\$34,218.32

INDUSTRIAL BONDS					
\$50,000	American Radiator..	4 $\frac{1}{2}$ s	1947	\$48,000.00	\$2,250.00
50,000	Anaconda Copper...	4 $\frac{1}{2}$ s	1950	49,355.51	2,205.24
100,000	Bethlehem Steel...	3 $\frac{1}{2}$ s	1952	86,500.00	1,178.81
200,000	National Dairy.....	3 $\frac{3}{4}$ s	1951	202,900.00	<i>491.15</i>
17,000	Smith & Wesson....	5 $\frac{1}{2}$ s	1948	16,830.00	935.00
180,000	United States Steel..	3 $\frac{1}{4}$ s	1948	180,000.00	<i>113.22</i>
Income from bonds sold, called or matured					10,080.14
<i>Total Industrial Bonds</i>				\$583,585.51	\$16,044.82

*Shares***INDUSTRIAL PREFERRED STOCKS**

700	American Sugar, Cum. Pfd.....	\$78,469.07	\$875.00
500	American Tobacco, Pfd.	69,405.80	300.00
500	Bausch & Lomb, Cum. Conv. Pfd..	50,000.00	500.00
1,000	duPont de Nemours, Cum. Deb....	130,226.50	6,000.00
1,500	General Motors, Pfd.....	181,251.37	7,500.00

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

Schedule H (Continued)

<i>Shares</i>		<i>Book Value</i>	<i>Net Income</i>
INDUSTRIAL PREFERRED STOCKS (Continued)			
500	Liggett & Myers, Pfd.....	\$82,246.24	\$175.00
466	A. D. Little Inc., Pfd.....	46,600.00	2,796.00
1,000	Shell Union Oil, Pfd.....	97,750.00	5,500.00
500	U. S. Rubber, Pfd.....	29,312.50	.....
1,000	U. S. Steel, Pfd.....	103,412.85	*10,250.00
	Income from stocks sold.....		7,000.00
	<i>Total Industrial Preferred Stocks....</i>	<i>\$868,674.33</i>	<i>\$40,896.00</i>
INDUSTRIAL COMMON STOCKS			
5,500	Air Reduction.....	\$235,099.17	\$15,125.00
250	Algonquin Printing.....	67,500.00	1,000.00
1,700	Allied Chemical and Dye.....	302,480.66	11,550.00
2,300	American Can.....	242,298.47	6,600.00
1,070	Anaconda Copper.....	29,694.00	1,337.50
1,200	Beechnut Packing.....	103,051.27	6,250.00
2,000	Borden.....	47,638.33	3,000.00
6,000	Borg Warner.....	216,251.72	12,000.00
2,000	Caterpillar Tractor.....	92,194.13	10,120.00
6,000	Central Aguirre Associates.....	158,208.85	10,020.00
500	Chrysler.....	30,087.63	250.00
2,700	Continental Can.....	144,344.59	6,750.00
1,700	Dow Chemical.....	226,298.46	4,500.00
2,200	Draper Corp.....	101,780.20	9,862.50
1,544	duPont de Nemours.....	146,292.03	6,794.00
19,500	Eastman Kodak.....	1,693,103.10	157,000.00
8,100	General Electric.....	136,373.85	16,170.00
5,176	General Motors.....	181,138.96	15,528.00
3,500	Humble Oil & Refining.....	233,090.00	6,625.00
2,500	Inland Steel.....	276,325.32	10,000.00
500	International Business Machines...	72,635.00	.....
3,100	International Harvester.....	123,863.98	12,400.00
5,065	International Nickel, Canada.....	133,846.82	10,826.43
1,000	Johns Manville.....	127,451.87	3,250.00
2,000	Kennecott Copper.....	111,150.95	5,650.00
1,500	Libbey-Owens-Ford.....	104,047.84	7,250.00
1,000	Minneapolis-Honeywell.....	27,250.57	3,250.00
2,522	Monsanto Chemical.....	162,791.44	7,516.00
1,700	Montgomery Ward.....	106,518.64	3,400.00
6,000	National Biscuit.....	187,106.54	8,000.00
2,000	National Lead.....	65,726.17	1,000.00
3,000	National Steel.....	230,901.41	8,250.00
2,500	J. C. Penney.....	225,238.84	13,125.00
2,500	Pittsburgh Plate Glass.....	117,865.55	14,375.00
4,000	Procter & Gamble.....	167,797.51	6,000.00
1,997	Pullman.....	127,624.59	5,491.77
1,000	St. Joseph Lead.....	55,050.92	1,500.00

* \$3,250. In arrears.

Schedule H (Continued)

Shares		Book Value	Net Income
<u>INDUSTRIAL COMMON STOCKS (Continued)</u>			
2,200	Sears Roebuck	\$169,412.95	\$12,100.00
1,000	Sherwin Williams	100,988.10	4,500.00
4,000	Standard Oil, Cal.	137,724.21	6,895.00
4,900	Standard Oil, N. J.	208,111.05	10,225.00
1,000	Texas Corp.	34,164.09	2,500.00
1,500	Timken Roller Bearing	106,312.70	6,000.00
4,200	Union Carbide & Carbon	203,574.92	12,800.00
2,000	United Carbon	137,565.94	9,000.00
5,600	United Fruit	235,690.30	21,428.00
3,500	United Shoe Machinery	240,696.58	10,803.50
Income from stocks sold or written off			5,491.00
<i>Total Industrial Common Stocks</i>		<i>\$8,384,360.22</i>	<i>\$523,508.70</i>

Par Value

PUBLIC UTILITY BONDS

\$200,000	Alabama Power	5s 1946	\$191,501.25	\$10,000.00
150,000	Am. Tel. & Tel.	3½s 1961	153,762.50	732.15
150,000	Appalachian Electric	4s 1963	148,125.00	155.56
100,000	Arkansas Power & Light . . .	5s 1956	101,521.00	5,000.00
150,000	Bell Tel. of Penn.	5s 1948	161,677.00	7,500.00
49,000	Blackstone Val. G. & E. . . .	5s 1939	49,000.00	2,450.00
290,000	Cedars Rapids Mfg. & Pr. . . .	5s 1953	276,853.85	14,500.00
150,000	Central N. Y. Power	3½s 1962	147,750.00	2,208.32
100,000	Columbia Gas & Elec.	5s 1952	95,914.50	5,000.00
37,000	Conn. Light & Power	7s 1951	34,847.91	2,625.00
100,000	Cons. Edison, N. Y.	3½s 1946	101,265.00	3,250.00
248,000	Consumers Power	4s 1944	248,000.00	9,920.00
99,000	Dayton Pr. & Lt.	3½s 1960	101,380.00	3,465.00
100,000	Detroit Edison, E.	5s 1952	104,299.00	5,000.00
100,000	Detroit Edison, D.	4½s 1961	100,000.00	4,500.00
150,000	Eastern Gas & Fuel	4s 1956	142,875.00	6,000.00
100,000	Georgia Power	5s 1967	88,152.75	1,108.62
100,000	Gulf States Utilities	4s 1966	104,155.00	438.66
150,000	Idaho Power	3½s 1967	154,906.25	843.76
100,000	Jersey Central Pr. & Lt. . . .	5s 1947	101,786.00	5,000.00
150,000	Louisville Gas & El.	3½s 1966	157,518.75	1,254.66
100,000	Memphis Pr. & Lt.	5s 1948	94,720.49	5,000.00
107,500	Miss. River Power	5s 1951	100,087.23	5,475.00
100,000	Monon. West Penn.	4½s 1960	100,750.00	262.50
100,000	New York Pr. & Light	4½s 1967	95,571.01	4,500.00
200,000	New York Telephone	4½s 1939	199,843.36	9,000.00
100,000	North American	5s 1961	100,990.00	5,000.00
100,000	North Boston Ltg.	3½s 1947	100,000.00	1,458.32
100,000	Ohio Edison	4s 1967	101,250.00	577.78
100,000	Ohio Pub. Service	4s 1962	99,250.00	22.22

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

Schedule H (Continued)

<i>Par Value</i>				<i>Book Value</i>	<i>Net Income</i>
PUBLIC UTILITY BONDS (Continued)					
\$100,000	Ohio Power.....	4½s	1956	\$98,088.50	\$4,500.00
150,000	Pac. Gas. & Elec.....	3¾s	1961	159,819.50	89.89
100,000	Penn. Power & Light ...	4½s	1981	96,250.00	4,500.00
150,000	Philadelphia Elec.....	3½s	1967	158,062.50	933.33
75,000	Providence Gas.....	4s	1963	74,437.50	3,000.00
99,000	Pub Serv. No. Ill.	4½s	1980	97,294.72	4,455.00
200,000	Shawinigan Water & Pr.	4½s	1967	202,222.20	3,978.73
50,000	Sierra Pacific Pr.....	5½s	1957	44,875.00	2,750.00
100,000	Southern Cal. Edison ...	3¾s	1945	99,687.50	3,750.00
150,000	Southern Cal. Edison ...	3¾s	1960	160,622.50	2,307.72
100,000	Southern Cal. Gas.....	4½s	1961	89,250.00	4,500.00
50,000	Syracuse Lighting.....	5s	1951	53,498.00	2,500.00
20,000	Tenn. Electric Power ...	5s	1956	19,750.00	1,000.00
50,000	Tennessee Power.....	5s	1962	46,625.00	2,500.00
175,000	Texas Power & Light ...	5s	1956	181,920.00	5,927.08
150,000	Union Elec.-Mo.	3¾s	1962	163,341.25	2,320.01
100,000	Virginia Elec. Lgt. & Pr.	4s	1955	101,077.00	4,000.00
100,000	West Penn. Power.....	5s	1963	93,482.50	5,000.00
100,000	Western Mass.....	3¼s	1946	100,974.00	3,250.00

Income from bonds sold, called or matured		17,145.08
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<i>Total Public Utility Bonds</i>	\$5,799,030.52	\$180,607.11
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*Shares***PUBLIC UTILITY PREFERRED STOCKS**

3,000	Cons. Edison N. Y., Pfd.....	\$302,176.46	\$15,000.00
2,000	Consumers Power, Pfd.....	184,926.16	6,075.00
2,500	Public Service N. J., 5%, Pfd.	254,816.98	12,500.00
171	Railway & Lgt. Sec., Pfd.....	14,364.00	.....
3,000	United Corp., Pref.....	139,276.75	9,000.00
900	West Penn. Power, 6%, Pfd.....	90,934.90	4,500.00

Income from stocks sold		3,174.00
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<i>Total Public Utility Preferred Stocks</i>	\$986,495.25	\$50,249.00
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PUBLIC UTILITY COMMON STOCKS

3,600	American Tel. & Tel.....	\$418,465.41	\$31,212.00
2,044	Boston Edison.....	296,703.67	11,358.00
5,000	Commonwealth Edison.....	147,313.59	6,250.00
1,500	Cons. Gas, El. Lgt. & Pr. Balt.....	132,250.73	5,400.00
2,500	Detroit Edison.....	370,140.84	15,000.00
1,000	Stone & Webster.....	29,507.65	

<i>Total Public Utility Common Stocks</i>	\$1,394,381.89	\$69,220.00
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Items under Net Income shown in *italics* indicate accrued interest paid.

Schedule H (Continued)

Par Value				Book Value	Net Income
RAILROAD BONDS					
\$100,000	Albany & Susquehanna . . .	3½s	1946	\$70,000.00	\$3,500.00
100,000	Atch. Top. & Santa Fe. . .	4½s	1948	106,958.00	4,500.00
100,000	Atch. Top. & Santa Fe C&A	4½s	1962	99,956.25	4,500.00
100,000	Atch. Top. & Santa Fe. . .	4s	1995	96,470.00	4,000.00
10,000	Atch. Top. & Santa Fe Reg.	4s	1995	8,900.00	400.00
100,000	B. & O., P., L. E. & W. Va.	4s	1941	97,337.50	4,000.00
100,000	Boston & Maine.	5s	1940	96,000.00	5,000.00
100,000	Canadian National.	4½s	1956	98,000.00	4,500.00
90,000	Canadian National.	4½s	1957	88,425.00	4,050.00
59,000	Canadian Pac. Eq. Tr. . . .	5s	1944	59,491.00	2,950.00
100,000	Chic. J. Rwy. & Un. Stk. Yds.	4s	1940	94,250.00	4,000.00
75,000	Chic. J. Rwy. & Un. Stk. Yds.	5s	1940	74,143.75	3,750.00
85,000	Chicago & N. W.	4¾s	1949	85,000.00	.....
100,000	Chicago & N. W.	4s	1987	96,500.00	.....
200,000	Chicago & N. W.	4½s	2037	189,500.00	.....
100,000	Chicago Union Sta.	3¾s	1963	104,223.00	3,750.00
75 000	Cincinnati Un. Term. . . .	5s	1957	76,858.00	3,750.00
150,000	Kansas City Term.	4s	1960	133,875.00	6,000.00
100,000	Missouri Pacific.	5s	1977	99,750.00	†2,500.00
100,000	N. Y. Connecting.	4½s	1953	98,625.00	4,500.00
75,000	Northern Pacific.	4s	1997	67,875.00	3,000.00
182,000	Northern Pacific.	6s	2047	193,633.00	10,920.00
100,000	Oreg. R.R. & Navigation	4s	1946	99,410.83	4,000.00
100,000	Pennsylvania.	4½s	1960	115,300.00	4,500.00
100,000	Pennsylvania.	4½s	1965	100,600.00	4,500.00
37,500	Pere Marquette B.	4s	1956	37,500.00	1,500.00
117,900	Pere Marquette A.	5s	1956	104,719.59	5,895.00
51,000	Rio Grande West.	4s	1939	49,935.00	.....
83,000	St. L., Iron Mt. & So. . . .	4s	1933	72,542.50	3,320.00
5,000	St. L., Iron Mt. & So. . . .	4s	1933	4,812.50	200.00
100,000	Southern Pacific.	3¾s	1946	98,750.00	3,750.00
100,000	Southern Pacific.	4s	1955	95,250.00	4,000.00
100,000	Southern Pacific.	4½s	1969	90,698.13	4,500.00
100,000	Term R.R. of St. Louis. . .	4½s	1939	100,000.00	4,500.00
100,000	Union Pacific.	4s	1947	100,311.00	4,000.00
75,000	Washington Term.	3½s	1945	68,196.37	2,625.00
Income from bonds sold, called or matured					20,716.20
Total Railroad Bonds.				\$3,273,796.42	\$147,576.20

Shares

RAILROAD PREFERRED STOCKS

1,000	Pere Marquette, Pr. Pref.	\$80,024.40	*\$11,250.00
Income from stocks sold.			2,507.50
Total Railroad Preferred Stocks.		\$80,024.40	\$13,757.50

*\$10,000. In arrears.

†In arrears.

Schedule H (Continued)

<i>Shares</i>		<i>Book Value</i>	<i>Net Income</i>
<u>RAILROAD COMMON STOCKS</u>			
800	Atch. Top. & S. Fe	\$110,175.00	\$1,600.00
2,000	Chesapeake & Ohio	97,840.60	9,210.50
350	Norfolk & Western	49,892.78	5,600.00
800	Union Pacific	107,831.90	6,042.00
<i>Total Railroad Common Stocks</i>		<i>\$365,740.28</i>	<i>\$22,452.50</i>
<u>OTHER BONDS</u>			
\$200,000	Adams Express..... 4 $\frac{1}{4}$ s 1946	\$199,388.81	\$2,573.02
100,000	Aldred Invest. Trust.... 4 $\frac{1}{2}$ s 1967	108,869.00	4,500.00
100,000	Equit. Office Bldg..... 5s 1952	100,000.00	5,000.00
252,000	Gen. Motors Acc. Corp... 3s 1946	256,695.00	7,560.00
170,000	Lawyers Mtge. Inv. Corp. 5 $\frac{1}{2}$ s 1940	169,500.00	3,550.00
200,000	Niagara Shares Corp.... 5 $\frac{1}{2}$ s 1950	195,780.81	9,045.06
<i>Income from bonds sold, called or matured</i>			<i>4,274.02</i>
<i>Total Other Bonds</i>		<i>\$1,030,233.62</i>	<i>\$36,502.10</i>
<u>BANK STOCKS</u>			
2,500	Bankers Trust, N. Y.	\$156,975.00	\$4,750.00
1,500	Central Hanover Bk. & Tr., N. Y....	184,425.00	6,000.00
5,000	Chase National, N. Y.	261,212.50	7,000.00
2,500	Chemical Bank & Trust, N. Y.	167,593.75	4,500.00
4,822	First National, Boston	293,173.21	9,644.00
80	First National, N. Y.	172,170.60	8,000.00
700	Guaranty Trust, N. Y.	232,343.04	8,400.00
5,000	National City, N. Y.	234,212.50	5,000.00
100	New England Trust, Boston	40,000.00	3,000.00
<i>Total Bank Stocks</i>		<i>\$1,742,105.60</i>	<i>\$56,294.00</i>
<u>INSURANCE STOCKS</u>			
165	Boston	\$113,736.00	\$3,465.00
2,500	Hartford	156,168.76	3,000.00
1,500	Phoenix	107,424.50	3,750.00
<i>Income from stocks sold</i>			<i>674.00</i>
<i>Total Insurance Stocks</i>		<i>\$377,329.26</i>	<i>\$10,889.00</i>
<u>OTHER STOCKS</u>			
680	Boston R. E. Trust	\$71,661.64	\$1,360.00
100	Christiana Securities	250,000.00	8,430.00
200	Christiana Securities, Pfd.	25,000.00	350.00
<i>Income from stocks sold</i>			<i>294.00</i>
<i>Total Other Stocks</i>		<i>\$346,661.64</i>	<i>\$10,434.00</i>

Schedule H (Continued)

<i>Par Value</i>		<i>Book Value</i>	<i>Net Income</i>
<u>MORTGAGE NOTES</u>			
\$3,500	Beta Nu House Corp.....	\$3,500.00	\$200.00
4,300	Bigelow.....	4,300.00	216.25
16,250	Gamma Pi Corp.....	16,250.00	843.75
60,000	Martin.....	60,000.00	600.00
3,200	McKenzie.....	3,200.00	123.86
150,000	M. I. T. Dormitory.....	150,000.00	6,000.00
2,275	Orlogski.....	2,275.00	115.32
4,250	Phi Beta Epsilon Corp.....	4,250.00	231.25
10,000	Phi Kappa Sigma Trust.....	10,000.00	541.94
7,125	Phi Mu Delta.....	7,125.00	276.74
11,500	Theta Chi Trust.....	11,500.00	593.06
70,000	Walton Trust.....	70,000.00	3,500.00
<i>Total Mortgage Notes.....</i>		<i>\$342,400.00</i>	<i>\$13,242.17</i>
<u>REAL ESTATE</u>			
	Avon Street, Boston.....	\$205,632.55	\$4,158.10
	Broad and High Streets, Boston.....	100,000.00	4,244.72
	Franklin Street, Boston.....	385,364.53	5,451.67
	Haven Avenue, Mattapan.....	100.00	*100.62
	Memorial Drive, Cambridge.....	40,000.00	*1,366.20
	Graduate House, Cambridge.....	210,000.00	.....
	Main Street, Worcester.....	125,000.00	.....
<i>Total Real Estate.....</i>		<i>\$1,066,097.08</i>	<i>\$12,387.67</i>
<u>RECAPITULATION, GENERAL INVESTMENTS</u>			
	U. S. Gov. Bonds.....	\$4,963,837.93	\$223,217.09
	Canadian Gov. Bonds.....	810,790.37	34,218.32
	Industrial Bonds.....	583,585.51	16,044.82
	Industrial Preferred Stocks.....	868,674.33	40,896.00
	Industrial Common Stocks.....	8,384,360.22	523,508.70
	Public Utility Bonds.....	5,799,030.52	180,607.11
	Public Utility Preferred Stocks.....	986,495.25	50,249.00
	Public Utility Common Stocks.....	1,394,381.89	69,220.00
	Railroad Bonds.....	3,273,796.42	147,576.20
	Railroad Preferred Stocks.....	80,024.40	13,757.50
	Railroad Common Stocks.....	365,740.28	22,452.50
	Other Bonds.....	1,030,233.62	36,502.10
	Bank Stocks.....	1,742,105.60	56,294.00
	Insurance Stocks.....	377,329.26	10,889.00
	Other Stocks.....	346,661.64	10,434.00
	Mortgage Notes.....	342,400.00	13,242.17
	Real Estate.....	1,066,097.08	12,387.67
<i>Total General Investments.....</i>		<i>\$32,415,544.32</i>	<i>\$1,461,496.18</i>

* Expense.

Schedule H (Continued)

<i>Par Value or Shares</i>			<i>Book Value</i>	<i>Net Income</i>
INVESTMENTS, BABSON FUND				
950	American Public Welfare Trust.....		\$10,000.00	\$118.75
INVESTMENTS MALCOLM COTTON BROWN FUND				
\$25,000	Met. West Side.....	4s 1938	\$10,850.00	.....
2,000	U. S. Treasury.....	3¼s 1945	2,084.00	\$65.00
<i>Total Brown Fund.....</i>			<i>\$12,934.00</i>	<i>\$65.00</i>
INVESTMENTS, COFFIN MEMORIAL FUND				
350	Light & Pr. Sec. Co., Pfd.....		\$35,000.00	\$2,100.00
10	United Gas & Imp., Pfd.....		973.04	50.00
\$6,000	U. S. Treasury.....	3s 1948	6,301.00	180.00
<i>Total Coffin Fund.....</i>			<i>\$42,274.04</i>	<i>\$2,330.00</i>
INVESTMENTS, DRAPER FUND				
\$12,000	U. S. Treasury.....	3¼s 1945	\$12,673.00	\$390.00
5,000	U. S. Treasury.....	3¾s 1947-43	5,374.88	54.87
22,000	Ontario.....	5s 1959	21,890.00	1,100.00
8,000	Cons. Edison N. Y.....	3¼s 1946	8,300.00	260.00
10,000	Detroit Edison, D.....	4½s 1961	11,489.00	450.00
20,000	New York Tel.....	4½s 1939	19,395.00	900.00
14,000	Ohio Power.....	4½s 1956	12,202.50	630.00
10,000	Texas Power & Light ...	5s 1956	10,447.37	237.50
Income from bonds sold, called or matured				422.36
<i>Total Draper Fund.....</i>			<i>\$101,771.75</i>	<i>\$4,444.73</i>
INVESTMENTS, SOLAR ENERGY FUND				
100	Godfrey L. Cabot, Inc.....		\$647,700.00	\$4,000.00
INVESTMENTS, SUSAN H. SWETT FUND				
\$10,000	Mass. Hospital Life Ins. Co.....		\$10,000.00	\$250.00
2,000	U. S. Treasury.....	3¼s 1941	2,078.00	65.00
<i>Total Swett Fund.....</i>			<i>\$12,078.00</i>	<i>\$315.00</i>
INVESTMENTS, FRANCES E. WESTON FUNDS				
\$9,100	Mortgage Note, Bartlett.....		\$9,100.00	\$377.02
INVESTMENTS, JONATHAN WHITNEY FUND				
\$41,000	U. S. Treasury.....	3¼s 1945	\$43,203.00	\$1,332.50
50,000	U. S. Treasury.....	4s 1954-44	55,421.00	2,000.00
46,000	U. S. Treasury.....	3¾s 1947-43	49,394.75	403.33
40,000	Canada.....	5s 1952	44,445.00	2,000.00

Schedule H (Continued)

<i>Par Value or Shares</i>				<i>Book Value</i>	<i>Net Income</i>
<u>INVESTMENTS, JONATHAN WHITNEY FUND (Continued)</u>					
\$47,000	Anaconda Copper	4½s	1950	\$49,487.00	\$2,182.50
50,000	Appalachian Electric	4s	1963	49,375.00	55.55
25,000	Bangor Hydro. Elec.	3¾s	1966	26,076.00	937.50
25,000	Detroit Edison, D	4½s	1961	28,724.00	1,125.00
25,000	Detroit Edison, D	5s	1952	24,825.00	1,250.00
25,000	Memphis Pr. & Lt.	5s	1948	24,333.85	1,250.00
25,000	New York Tel.	4½s	1939	24,150.39	1,125.00
20,000	Niagara Falls Pr.	3½s	1966	21,677.79	156.52
25,000	Pacific Gas & Elec.	3¾s	1961	25,685.00	937.50
25,000	So. Cal. Edison	3¾s	1960	24,760.00	937.50
25,000	Atch. Top. & S. Fe.	4½s	1962	24,381.25	1,125.00
50,000	Kansas City Term.	4s	1960	42,750.00	2,000.00
25,000	Southern Pacific	4s	1955	24,471.99	1,000.00
25,000	Virginian	3¾s	1966	25,623.00	937.50
Income from bonds sold, called or matured					4,869.89
<i>Total Whitney Fund</i>				\$608,784.02	\$25,201.15

INVESTMENTS, TECHNOLOGY LOAN FUND

\$30,000	U. S. Treasury	3½s	1947-43	\$31,950.00	\$590.62
25,000	U. S. Treasury	3½s	1947-43	26,890.00	357.21
50,000	U. S. Treasury	4s	1954-44	55,096.00	1,496.67
50,000	Am. International	5½s	1949	52,500.00	3,916.46
50,000	Am. Power & Light	6s	2016	50,338.00	3,000.00
200,000	Brook-Man. Tr.	4½s	1966	206,750.00	9,000.00
100,000	Eastern Gas & Fuel	4s	1956	93,496.00	4,000.00
25,000	Interboro Rap. Tr. C-D	5s	1966	25,000.00	1,250.00
50,000	Southern Bell Tel.	3¼s	1962	48,985.01	1,625.00
50,000	Tennessee Elec. Pr.	6s	1947	50,381.00	3,000.00
195	Cons. Gas. El. Lgt. & Pr. Balt.			25,000.00	702.00
500	International Power Securities, Pfd.			17,250.00	2,500.00
1,000	North American			36,796.89	1,600.00
1,250	Stone & Webster			36,698.75	.....
50,000	Baltimore & Ohio	4½s	1960	50,597.00	2,250.00
75,000	Chicago & N. W.	4¾s	1949	74,625.00	.....
75,000	Chicago R. I. & Pac.	4½s	1960	74,812.50	.....
Income from bonds sold					1,815.68
<i>Total Technology Loan Fund</i>				\$957,166.15	\$37,103.64

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

Schedule H (Continued)

<i>Par Value or Shares</i>			<i>Book Value</i>	<i>Net Income</i>
INVESTMENTS, EDWIN A. WYETH FUND				
\$10,000	U. S. Treasury	1½s 1939	\$10,000.00	\$150.00
22,000	U. S. Treasury	3s 1948-46	22,546.00	356.25
25,000	U. S. Treasury	4s 1954-44	27,714.00	1,000.00
10,000	U. S. Treasury	3½s 1952	10,530.00	53.82
100	American Can.		11,944.73	400.00
250	General Motors		8,500.00	750.00
250	Pullman		11,750.00	687.50
100	Standard Oil, N. J.		5,980.20	225.00
100	Union Carbide and Carbon		4,640.00	320.00
100	United Shoe Machinery		8,941.25	425.00
125	American Tel. & Tel.		13,125.00	1,125.00
10,000	Carolina Pr. & Lt.	5s 1956	8,300.00	500.00
10,000	Central N. Y. Power	3¾s 1962	10,537.50	50.00
9,000	Columbia Gas & Elec.	5s 1952	8,310.78	450.00
10,000	Cons. Edison N. Y.	3¼s 1946	10,175.00	325.00
14,000	Miss. River Power	5s 1951	14,627.00	700.00
16,000	So. Cal. Edison	3¾s 1960	15,880.00	600.00
10,000	Texas Pr. & Lgt.	5s 1956	10,479.00	500.00
15,000	Balt. & Ohio	4s 1948	15,210.00	600.00
5,000	Can. Pac. Eq. Tr.	5s 1944	5,255.00	250.00
10,000	Kansas City Term.	4s 1960	10,420.00	400.00
10,000	Union Pacific	4s 1947	10,538.00	400.00
	Income from bonds sold, called, matured			1,427.08
	<i>Total Wyeth Fund</i>		\$255,403.46	\$11,594.65
<i>Grand Total All Investments</i>			\$35,072,755.74	\$1,547,046.12
			(Schedule D)	(Schedule B)

SCHEDULE H-1

AGENCY FUND

INVESTMENTS, HEWETT FUND				
\$15,000	U. S. Treasury	3¼s 1941	\$15,419.00	\$342.18
23,000	U. S. Treasury	4s 1954-44	25,322.00	874.89
8,000	Scoville Mfg. Co.	5½s 1945	7,920.00	990.00
22,000	United Biscuit	5s 1950	22,242.00	1,100.00
15,000	Alabama Power	5s 1951	13,425.00	750.00
15,000	Cent. N. Y. Power	3¾s 1962	15,806.25	75.00
17,000	N. Y. Power & Light	4½s 1967	15,999.35	765.00
27,000	North American	5s 1961	27,253.00	1,350.00
25,000	Texas Power & Light	5s 1956	26,057.00	980.42
20,000	Atch. Top. & S. Fe.	4½s 1948	22,046.00	900.00
15,000	Can. Nat. Ry.	5s 1969	14,887.50	750.00
4,000	Can. Pac. Ry.	5s 1944	4,064.00	200.00
	Income from bonds called			1,300.00
	<i>Total Hewett Fund</i>		\$210,441.10	\$10,227.49
			(Schedule D)	

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

SCHEDULE J
EDUCATIONAL PLANT

Land, Buildings and Equipment

Land, east of Massachusetts Avenue, Cambridge	\$1,125,766.67
Land, west of Massachusetts Avenue	850,014.82
 Main Educational Building Group ¹	 5,216,842.66
George Eastman Research Laboratories	1,225,098.58
Pratt School of Naval Architecture	674,971.70
Guggenheim Aeronautical Laboratory	293,637.46
Wright Memorial Wind Tunnel ¹	21,046.66
Magnetic Substation ¹	33,609.05
 Aeronautical Engine Testing Laboratory	 121,101.92
Mechanic Arts Building	83,658.89
Power Plant (including Machinery and Equipment)	389,064.17
Homberg Memorial Infirmary	188,441.60
Nuclear Research Building and Equipment	34,891.27
 Educational Equipment	 2,039,953.60
 Steam and Electrical Distribution System	 159,448.64
 Gas Engine, Hydraulic and Compression Laboratories	 68,301.88
Service Building and Garages	55,369.74
 Walker Memorial and Equipment	 714,587.02
 Dormitories and Equipment ²	 1,308,923.79
 Boathouse	 54,244.13
Field House and Squash Courts	84,042.54
Sailing Pavilion	28,849.09
 Camp, East Machias, Maine	 120,558.00
Camp, Dover, New Jersey	35,000.00
 Miscellaneous	 301,726.27
 Total June 30, 1938 (see Schedule D)	 \$15,229,150.15

¹ Not completed.

² Not including Graduate House (see Investments.)

SCHEDULE K

PRINCIPAL GIFTS AND APPROPRIATIONS FOR
EDUCATIONAL PLANT

George Eastman for Buildings	\$5,488,915.25
T. C. and P. S. duPont, Charles Hayden, for Mining Building	215,000.00
Pratt Fund, for School of Naval Architecture	675,150.00
Guggenheim Fund, for Aeronautical Laboratory	230,000.00
A. P. Sloan, Jr., for Aero Engine Laboratory	65,000.00
Subscriptions to Homberg Memorial Infirmary	110,225.00
 Maria A. Evans Fund, for Land	 169,080.60
T. C. duPont, for Land	625,000.00
Miscellaneous subscriptions and appropriations for Land	382,222.89
 Emma Rogers Fund, for Equipment	 528,077.06
F. W. Emery Fund, for Equipment	126,423.80
French Fund, for Equipment	100,843.34
Equipment from Boston, 1916 (estimated)	500,000.00
Sale of Land and Buildings, Boston, 1916 and 1938	1,629,202.78
 Maria A. Evans, for Dormitories	 161,192.55
Class of '93, for Dormitories	100,000.00
T. C. duPont, for Dormitories	100,000.00
Alumni Dormitory Fund	516,945.66
Barbour Fund, for Dormitories, Field House, etc.	483,048.29
Miscellaneous Funds, for Dormitories	129,816.26
 Walker Memorial Fund, for Walker Memorial	 167,303.96
 Alumni Fund, for Equipment, Dormitories, Walker	 622,119.38
 Other Funds, Donations, Appropriations	 2,706,824.49
 Total, June 30, 1938 (see Schedule D)	 \$15,832,391.31

SCHEDULE M
ENDOWMENT FUNDS FOR GENERAL PURPOSES

No.	Restricted Funds	Funds, June 30, 1987	Investment Income	Other Receipts	Expended or Transferred	Funds, June 30, 1988
101	George Robert Armstrong	\$5,000.00	\$227.50	.....	\$227.50	\$5,000.00
103	George Blackburn Mem. . .	907,356.90	41,268.50	\$297.46	41,268.50	907,654.36
105	Charles Choate	35,858.15	1,638.00	.....	1,638.00	35,858.15
107	Eben S. Draper	101,687.61	4,444.73	125.50	4,851.73	101,406.11
109	Coleman du Pont	211,375.66	9,691.50	4,551.89	9,691.50	215,927.55
111	Eastman Contract	9,498,869.55	432,204.50	.....	432,204.50	9,498,869.55
113	George Eastman (Building)	1,275,901.42	57,607.38	.....	822,424.05	511,084.75
115	Charles W. Eaton	243,337.03	11,056.50	.....	11,056.50	243,337.03
117	Educational Endowment . .	7,573,784.60	344,617.00	50.00	344,617.00	7,573,834.60
119	Martha Ann Edwards	30,000.00	1,365.00	.....	1,365.00	30,000.00
121	William Endicott	25,000.00	1,137.50	.....	1,137.50	25,000.00
123	Francis Appleton Foster . .	1,000,000.00	45,500.00	.....	45,500.00	1,000,000.00
125	John W. Foster	291,165.55	13,513.50	8,485.09	13,513.50	299,650.64
127	Alexis H. French	5,000.00	227.50	.....	227.50	5,000.00
129	Jonathan French	25,212.48	1,137.50	.....	1,137.50	25,212.48
131	Henry C. Frick	1,830,333.42	83,265.00	720.00	83,265.00	1,831,053.42
133	General Endowment	1,527,449.00	69,478.50	.....	69,478.50	1,527,449.00
135	Eliot Granger	21,568.43	955.50	.....	955.50	21,568.43
136	Charles Hayden . . . . .	.....	22,750.00	1,000,000.00	22,750.00	1,000,000.00
137	James Fund	163,654.21	7,462.00	.....	7,462.00	163,654.21
139	Katherine B. Lowell	5,000.00	227.50	.....	227.50	5,000.00
141	Thomas McCammon	15,000.00	682.50	.....	682.50	15,000.00
143	M. I. T. Alumni	2,950.80	5,005.00	256,873.03	50,000.00	214,828.83
145	Kate M. Morse	25,000.00	1,137.50	.....	1,137.50	25,000.00
147	Everett Morss	25,000.00	1,137.50	.....	1,137.50	25,000.00
149	Richard Perkins	50,000.00	2,275.00	.....	2,275.00	50,000.00
150	J. W. and B. L. Randall . .	83,452.36	3,776.50	.....	3,776.50	83,452.36
151	Wm. Barton Rogers Mem. .	250,225.00	11,375.00	.....	11,375.00	250,225.00
152	² Saltonstall Fund	61,410.99	2,775.50	.....	2,081.63	62,104.86
153	Samuel E. Sawyer	4,764.40	213.85	.....	213.85	4,764.40
155	Andrew Hastings Spring . .	50,000.00	2,275.00	.....	2,275.00	50,000.00
157	Seth K. Sweetser	25,061.62	1,137.50	.....	1,137.50	25,061.62
159	William J. Walker	23,613.59	1,092.00	.....	1,092.00	23,613.59
161	Horace Herbert Watson . .	34,076.69	1,547.00	.....	1,547.00	34,076.69
163	Albion K. P. Welch	5,000.00	227.50	.....	227.50	5,000.00
165	Everett Westcott	169,394.00	7,780.50	2,000.00	7,780.50	171,394.00
167	Marion Westcott	237,702.00	10,829.00	500.00	10,829.00	238,202.00
169	³ George Wigglesworth	25,657.72	1,183.00	.....	1,064.70	25,776.02
171	Edwin A. Wyeth	255,829.43	11,594.65	168.50	13,179.79	254,412.79
		<u>\$26,121,692.61</u>	<u>\$1,215,819.61</u>	<u>\$1,273,771.47</u>	<u>\$2,026,811.25</u>	<u>\$26,584,472.44</u>

Unrestricted Funds

175	Edmund D. Barbour	\$144,822.53	\$3,276.00	.....	\$120,276.00	\$27,822.53
176	N. Loring Danforth	5,000.00	227.50	.....	227.50	5,000.00
177	Pierre du Pont . . . . .	.....	273.00	\$25,000.00	5,273.00	20,000.00
178	F. W. Emery . . . . .	.....	.....	250.00	.....	250.00
179	Arthur F. Estabrook	4,000.00	182.00	1,800.00	5,982.00	.....

¹ See alphabetical listing and description of Funds on pages 184-196.

² One-fourth of net income added to Fund.

³ Ten per cent of gross income added to Fund.

Schedule M (Continued)

No.	Unrestricted Funds (Continued)	Funds, June 30, 1937	Investment Income	Other Receipts	Expended or Transferred	Funds, June 30, 1938
180	Henrietta G. Fitz.....	\$10,000.00	\$455.00	.....	\$455.00	\$10,000.00
181	George Wyman Hamilton ..	24,182.47	273.00	.....	24,321.62	133.85
183	James W. Henry.....	8,226.08	364.00	.....	364.00	8,226.08
185	Abby W. Hunt.....	12,000.00	273.00	\$4,000.00	12,273.00	4,000.00
187	Industrial Fund.....	48,716.22	1,592.50	.....	12,042.01	38,266.71
189	Hiram H. Logan.....	17,000.00	546.00	2,455.20	7,746.00	12,255.20
193	Moses W. Oliver.....	11,220.49	500.50	.....	11,720.99	.....
195	Emerette O. Patch.....	7,500.00	341.25	.....	341.25	7,500.00
197	Preston Player.....	20,000.00	910.00	.....	20,910.00	.....
199	Charles O. Prescott.....	30,640.78	1,365.00	.....	27,165.00	4,840.78
201	Robert E. Rogers.....	7,680.77	364.00	.....	364.00	7,680.77
203	Ellen V. Smith.....	25,000.00	1,137.50	.....	26,137.50	.....
205	Frank G. Webster.....	25,000.00	1,137.50	.....	1,137.50	25,000.00
		<u>\$400,989.34</u>	<u>\$13,217.75</u>	<u>\$33,505.20</u>	<u>\$276,736.37</u>	<u>\$170,975.92</u>

SCHEDULE M
1¹ENDOWMENT FUNDS FOR DESIGNATED PURPOSES

Special Deposit and Agency Funds

210	Endowment Reserve.....	\$1,072,777.50	.....	\$169,223.00	\$342,739.57	\$899,260.93
211	Income Equalization Reserve	85,000.00	\$3,867.50	.....	28,000.00	60,867.50
212	Albert Fund.....	1,940.00	45.50	5,000.00	1,862.59	5,122.91
214	Alpha Chi Sigma House Fund	2,716.85	122.85	105.00	.....	2,944.70
216	Anonymous (1924).....	2,008.71	91.00	.....	.....	2,099.71
218	New Building Fund (1937)	67,283.33	.....	900,000.00	967,283.33	.....
220	Basket Ball Fund.....	2,390.68	109.20	.....	.....	2,499.88
222	Bess Bigelow Fund.....	10,300.00	809.90	15,000.00	.....	26,109.90
225	Class of 1923.....	18,064.18	819.00	745.22	159.39	19,469.01
226	Class of 1924.....	18,821.46	864.50	865.13	97.64	20,453.45
227	Class of 1925.....	11,526.48	546.00	433.67	106.68	12,399.47
229	Class of 1926.....	14,584.83	682.50	124.40	.....	15,391.73
230	Class of 1927.....	11,658.52	546.00	873.70	.....	13,078.22
231	Class of 1928.....	15,721.44	773.50	15,497.31	88.20	31,904.05
232	Class of 1929.....	8,566.29	409.50	593.78	.....	9,569.57
233	Class of 1930.....	1,229.57	59.15	100.00	.....	1,388.72
237	Class of 1934.....	253.92	15.95	121.74	.....	391.61
238	Class of 1935.....	329.19	13.65	.....	.....	342.84
239	Class of 1936.....	457.50	20.50	.....	.....	478.00
245	Cosmic Terr. Research.....	.....	409.50	19,200.00	.....	19,609.50
248	Drama Club Theatre Fund ..	.....	.....	400.00	.....	400.00
250	Industrial Relations.....	.....	910.00	42,100.00	10,500.00	32,510.00
260	M.I.T. Teachers' Insurance	5,031.76	.....	29,079.55	28,611.31	5,500.00
261	M.I.T. Teachers' Insurance (Special).....	74,226.05	3,776.50	17,235.33	5,994.65	89,243.23
263	M.I.T. Alumni Association Permanent Funds.....	68,554.72	3,185.00	3,603.05	.....	75,342.77
264	Henry A. Morss Nautical ..	3,004.36	136.50	.....	200.00	2,940.86
265	Louisville Technology Foundation Fund.....	50.00	.....	.....	.....	50.00

¹See alphabetical listing and description of Funds on pages 184-196.

¹Schedule M (Continued)

No.	Special Deposit and Agency Funds (Continued)	Funds, June 30, 1937	Investment Income	Other Receipts	Expended or Transferred	Funds, June 30, 1938
266	Class of 1917, Special.....	\$100.00	\$4.55	.....	.....	\$104.55
268	Class of 1934, Special.....	539.19	22.75	.....	.....	561.94
270	Class of 1898 Loan.....	†8,203.79	373.10	\$60.50	.....	†8,637.39
273	Class of 1874.....	200.43	9.10	.....	.....	209.53
275	Professors' Fund.....	1,303.17	.....	.....	\$1,303.17	.....
278	Richards Portrait.....	672.50	31.85	.....	.....	704.35
280	Rockefeller Found. Research	80.00	.....	.....	80.00	.....
281	W. P. Ryan, Special.....	3,605.52	163.80	.....	.....	3,769.32
282	Theo. Edward Schwarz Mem.	3,221.25	.....	.....	4,388.74	*1,167.49
283	Sedgwick Memorial Lecture Fund.....	9,517.79	441.35	461.41	.....	10,420.55
284	Lillie C. Smith.....	4,944.29	222.95	.....	60.57	5,106.67
285	Technology Matrons' Teas	9,193.62	400.40	.....	440.00	9,154.02
286	W. B. S. Thomas' Fund ...	2,156.15	100.10	.....	.....	2,256.25
290	Undergraduate Activities Trust.....	1,214.41	54.60	.....	.....	1,269.01
292	Undergraduate Publication Trust.....	17,051.96	773.50	.....	.....	17,825.46
294	Undergraduate Dues, Res. Athletics.....	16,365.84	682.50	.....	2,215.00	14,833.34
296	Undergraduate Dues, Res. Contingent.....	15,334.57	682.50	.....	.....	16,017.07
		<u>\$1,590,201.82</u>	<u>\$22,176.75</u>	<u>\$1,220,822.79</u>	<u>\$1,394,130.84</u>	<u>\$1,439,070.52</u>

FUNDS FOR SALARIES

301	Samuel C. Cobb For General Salaries.....	\$36,551.31	\$1,665.30	.....	\$1,665.30	\$36,551.31
303	Sarah H. Forbes For General Salaries.....	500.00	22.75	.....	22.75	500.00
305	George A. Gardner For General Salaries.....	20,000.00	910.00	.....	910.00	20,000.00
309	James Hayward Professorship of Engineering .	18,800.00	855.40	.....	855.40	18,800.00
311	William P. Mason Professorship of Geology.....	18,800.00	855.40	.....	855.40	18,800.00
313	Henry B. Rogers For General Salaries.....	25,000.00	1,137.50	.....	1,137.50	25,000.00
315	Nathaniel Thayer Professorship of Physics.....	25,000.00	1,137.50	.....	1,137.50	25,000.00
317	Elihu Thomson Professorship, Elec. Eng.	18,680.87	850.85	5,000.00	850.85	23,680.87
		<u>\$163,332.18</u>	<u>\$7,434.70</u>	<u>\$5,000.00</u>	<u>\$7,434.70</u>	<u>\$168,332.18</u>

¹ See alphabetical listing and description of Funds on pages 184-196.

* Overdraft.

† Exclusive of student notes receivable. (See Schedule P.)

²Schedule M (Continued)

No.		<i>Funds, June 30, 1937</i>	<i>Investment Income</i>	<i>Other Receipts</i>	<i>Expended or Transferred</i>	<i>Funds, June 30, 1938</i>
FUNDS FOR LIBRARY						
321	Walter S. Barker	\$11,000.34	\$486.85	.....	\$454.52	\$11,032.67
323	Ednah Dow Cheney	15,053.32	682.50	\$.10	590.39	15,145.53
325	Frank Harvey Cilley	85,672.95	3,913.00	.....	3,466.50	86,119.45
327	Charles Lewis Flint	5,629.12	250.25	.....	240.30	5,639.07
329	Friends of the Library	2,295.00	.....	\$90.00	2,385.00	.....
341	William Hall Kerr	3,752.77	168.35	.....	74.38	3,846.74
343	George A. Osborne	10,326.03	455.00	.....	395.98	10,385.05
345	Arthur Rotch, Architectural . .	6,896.39	313.95	.....	225.18	6,985.16
349	John Hume Tod	3,087.45	136.50	.....	100.81	3,123.14
351	Theodore N. Vail	40,691.64	1,851.85	.....	2,059.17	40,484.32
		<u>\$184,405.01</u>	<u>\$8,258.25</u>	<u>\$90.10</u>	<u>\$9,992.23</u>	<u>\$182,761.13</u>
FUNDS FOR DEPARTMENTS						
401	William Parsons Atkinson	\$13,082.20	\$591.50	.....	\$591.50	\$13,082.20
403	Frank Walter Boles Memorial . .	31,279.69	1,410.50	.....	218.75	32,471.44
405	William E. Chamberlain	7,309.77	332.15	.....	332.15	7,309.77
407	Chemical Engineering Practice .	257,772.97	11,739.00	.....	11,739.00	257,772.97
409	Crosby Honorary Fund	1,774.26	81.90	.....	200.00	1,656.16
411	Susan E. Dorr	95,955.67	4,368.00	.....	4,368.00	95,955.67
412	George Eastman	400,000.00	18,200.00	.....	18,200.00	400,000.00
414	Arthur Dehon Little Memorial .	46,800.00	2,129.40	.....	2,329.40	46,600.00
416	John Lawrence Mauran	479.75	.....	.....	479.75	.....
417	George Henry May	5,000.00	227.50	.....	227.50	5,000.00
418	Metallurgy, Special . . . . .	.....	.....	\$10,000.00	8,980.00	1,020.00
419	Susan Minns	40,000.00	.....	.....	.....	40,000.00
420	Forris Jewett Moore	30,064.66	1,046.50	.....	10,353.66	20,757.50
422	William E. Nickerson	13,929.36	546.00	.....	5,361.52	9,113.84
424	Edward D. Peters	5,946.66	268.45	.....	64.40	6,150.71
425	Pratt Naval Architectural	392,399.95	17,836.00	.....	17,836.00	392,399.95
426	Frances E. Roper	2,000.00	91.00	.....	91.00	2,000.00
427	Arthur Rotch	25,000.00	1,137.50	.....	1,137.50	25,000.00
429	W. T. Sedgwick	87,184.11	3,458.00	.....	7,000.00	83,642.11
431	¹ Edmund K. Turner	257,375.19	11,693.50	.....	9,290.29	259,778.40
433	William Lyman Underwood	18,762.98	773.50	.....	2,500.00	17,036.48
		<u>\$1,732,117.22</u>	<u>\$75,930.40</u>	<u>\$10,000.00</u>	<u>\$101,300.42</u>	<u>\$1,716,747.20</u>
FUNDS FOR RESEARCH						
443	Samuel Cabot	\$52,012.31	\$2,275.00	.....	\$2,500.00	\$51,787.31
444	Crane Automotive Research . . .	3,699.82	168.35	.....	.....	3,868.17
449	Ellen H. Richards	22,275.11	1,001.00	.....	633.86	22,642.25
451	Charlotte B. Richardson	46,149.58	2,047.50	.....	2,000.00	46,197.08
452	William Barton and Emma Savage Rogers . . . . .	.....	3,958.50	\$102,064.18	578.84	105,443.84
453	Solar Energy . . . . .	.....	4,000.00	647,700.00	3,500.00	648,200.00
454	Henry N. Sweet	8,366.50	382.20	.....	.....	8,748.70
456	Textile Research Fund	3,190.08	136.50	.....	400.00	2,926.58
458	Edward Whitney	24,720.59	618.80	.....	16,875.00	8,464.39
459	Wright Memorial Wind Tunnel .	48,065.00	2,730.00	32,500.00	21,046.66	62,248.34
		<u>\$208,478.99</u>	<u>\$17,317.85</u>	<u>\$782,264.18</u>	<u>\$47,534.36</u>	<u>\$960,526.66</u>

¹One-fourth of net income added to Fund.²See alphabetical listing and description of Funds on pages 184-196.

¹Schedule M (Continued)

No.		Funds, June 30, 1937	Investment Income	Other Receipts	Expended or Transferred	Funds, June 30, 1938
FUNDS FOR FELLOWSHIPS						
463	William Sumner Bolles.....	\$27,969.15	\$1,274.00	.....	\$1,200.00	\$28,043.15
464	Malcolm Cotton Brown.....	12,345.02	65.00	.....	12.00	12,398.02
466	Collamore.....	14,610.86	664.30	.....	550.00	14,725.16
468	Dalton Graduate Chemical	7,568.59	327.60	.....	350.00	7,546.19
469	du Pont de Nemours .....	.....	.....	\$750.00	750.00	.....
474	Rebecca R. Joslin.....	†8,485.53	386.75	.....	.....	†8,872.28
476	Wilfred Lewis.....	5,420.21	245.70	.....	.....	5,665.91
478	Moore.....	32,173.82	1,456.00	.....	1,004.20	32,625.62
480	Willard B. Perkins	7,247.26	327.60	.....	.....	7,574.86
482	Proctor.....	.....	.....	1,500.00	1,500.00	.....
484	Proprietors Locks and Canals ..	4,126.16	182.00	.....	.....	4,308.16
486	Henry Bromfield Rogers.....	25,474.82	1,155.70	.....	1,000.00	25,630.52
488	Richard Lee Russel.....	3,167.83	145.60	.....	.....	3,313.43
490	Henry Saltonstall.....	11,023.44	500.50	.....	500.00	11,023.94
492	James Savage.....	12,560.38	568.75	.....	.....	13,129.13
493	Sloan.....	.....	.....	1,000.00	1,000.00	.....
495	Susan H. Swett.....	11,655.18	315.00	.....	26.00	11,944.18
496	Gerard Swope.....	138.75	.....	.....	.....	138.75
497	Frank Hall Thorp.....	10,778.29	486.85	.....	500.00	10,765.14
498	Louis Francisco Verges.....	10,343.20	468.65	.....	500.00	10,311.85
		<u>\$205,088.49</u>	<u>\$8,570.00</u>	<u>\$3,250.00</u>	<u>\$8,892.20</u>	<u>\$208,016.29</u>

FUNDS FOR SCHOLARSHIPS

501	Elisha Atkins.....	\$5,251.65	\$236.60	.....	\$250.00	\$5,238.25
503	Billings Student.....	52,132.12	2,366.00	.....	2,200.00	52,298.12
504	Jonathan Bourne.....	10,988.32	500.50	.....	500.00	10,988.82
505	Albert G. Boyden.....	588,037.78	26,754.00	.....	26,443.33	588,348.45
506	Harriet L. Brown.....	7,694.88	350.35	.....	350.00	7,695.23
508	Nino Tesher Catlin.....	1,059.09	45.50	.....	50.00	1,054.59
511	Lucius Clapp.....	5,278.65	241.15	.....	250.00	5,269.80
513	Class of 1896.....	†6,331.15	291.20	\$70.00	250.00	†6,442.35
514	Class of 1909.....	1,631.51	72.80	13.67	.....	1,717.98
515	Class of 1938.....	.....	.....	422.50	.....	422.50
516	Lucretia Crocker.....	80,119.71	3,640.00	.....	3,725.00	80,034.71
517	Isaac W. Danforth.....	5,548.55	250.25	.....	250.00	5,548.80
520	Ann White Dickinson.....	42,896.43	1,951.95	.....	2,000.00	42,848.38
521	Thomas M. Drown.....	53,445.16	2,429.70	.....	2,400.00	53,474.86
524	Farnsworth.....	5,697.61	259.35	.....	250.00	5,706.96
526	Charles Lewis Flint.....	5,706.41	259.35	.....	250.00	5,715.76
527	Sarah S. Forbes.....	3,820.71	172.90	.....	150.00	3,843.61
531	George Hollingsworth.....	5,329.41	241.15	.....	200.00	5,370.56
533	T. Sterry Hunt.....	3,342.14	150.15	.....	150.00	3,342.29

¹ See alphabetical listing and description of Funds on pages 184-196.

† Exclusive of student notes receivable. (See Schedule P.)

¹Schedule M (Continued)

No.		Funds, June 30, 1937	Investment Income	Other Receipts	Expended or Transferred	Funds, June 30, 1938
534	William F. Huntington.....	\$5,477.56	\$250.25	.....	\$250.00	\$5,477.81
536	Joy Scholarships.....	17,853.82	809.90	.....	800.00	17,863.72
538	William Litchfield.....	5,571.55	263.90	.....	250.00	5,585.45
539	Elisha T. Loring.....	5,581.34	254.80	.....	250.00	5,586.14
541	Lowell Institute Scholarship ...	2,794.59	127.40	.....	125.00	2,796.99
542	Rupert A. Marden.....	2,090.12	91.00	.....	90.00	2,091.12
543	George Henry May.....	†8,335.95	382.20	\$25.00	650.00	†8,093.15
545	James H. Mirrlees.....	2,782.74	127.40	.....	100.00	2,810.14
547	Nichols Scholarship.....	5,549.39	250.25	.....	250.00	5,549.64
548	Charles C. Nichols.....	5,546.84	250.25	.....	250.00	5,547.09
550	John Felt Osgood.....	5,411.14	245.70	.....	250.00	5,406.84
551	George L. Parmelee.....	19,250.46	873.60	.....	850.00	19,274.06
552	Richard Perkins.....	54,749.49	2,488.85	.....	2,500.00	54,738.34
553	Thomas Adelbert Read.....	22,270.28	1,010.10	.....	1,000.00	22,280.38
554	John Roach.....	3,040.00	136.50	.....	.....	3,176.50
555	William P. Ryan Memorial	4,080.23	186.55	111.35	.....	4,378.13
556	John P. Schenkl.....	47,561.85	2,161.25	.....	1,990.00	47,733.10
557	Thomas Sherwin.....	5,519.50	250.25	.....	250.00	5,519.75
558	Horace T. Smith.....	34,393.85	1,565.20	.....	1,500.00	34,459.05
559	Sons and Daughters New England Colony.....	638.52	27.30	.....	25.00	640.82
560	Samuel E. Tinkham.....	2,502.64	113.75	.....	100.00	2,516.39
562	F. B. Tough.....	†499.63	27.30	111.66	.....	†638.59
563	Susan Upham.....	1,203.09	54.60	.....	50.00	1,207.69
565	Vermont Scholarship.....	25,858.06	937.30	.....	1,125.00	25,670.36
567	Ann White Vose.....	63,195.29	2,866.50	.....	2,800.00	63,261.79
569	Arthur M. Waitt.....	10,574.81	482.30	.....	450.00	10,607.11
571	Louis Weissbein.....	4,422.40	200.20	.....	200.00	4,422.60
573	Frances Erving Weston.....	6,880.55	306.81	.....	.....	7,187.36
574	Samuel Martin Weston.....	5,472.54	224.91	.....	.....	5,697.45
576	Amasa J. Whiting.....	4,884.57	222.95	.....	200.00	4,907.52
577	Elizabeth Babcock Willmann..	5,392.01	245.70	.....	200.00	5,437.71
		<u>\$1,273,696.09</u>	<u>\$57,647.87</u>	<u>\$754.18</u>	<u>\$56,173.33</u>	<u>\$1,275,924.81</u>

FUNDS FOR PRIZES

580	Babson.....	.....	\$118.75	\$10,000.00	.....	\$10,118.75
581	Robert A. Boit.....	\$5,207.55	236.60	.....	\$240.00	5,204.15
583	Class of 1904.....	615.17	27.30	.....	15.00	627.47
585	Roger Defriez Hunneman.....	1,017.59	45.50	.....	50.00	1,013.09
587	James Means.....	3,329.34	150.15	.....	100.00	3,379.49
589	Arthur Rotch.....	7,190.64	327.60	.....	200.00	7,318.24
591	Arthur Rotch, Special.....	10,565.52	482.30	.....	200.00	10,847.82
593	Samuel W. Stratton.....	1,763.60	100.00	.....	117.77	1,745.83
		<u>\$29,689.41</u>	<u>\$1,488.20</u>	<u>\$10,000.00</u>	<u>\$922.77</u>	<u>\$40,254.84</u>

¹ See alphabetical listing and description of Funds on pages 184-196.

† Exclusive of student notes receivable. (See Schedule P.)

²Schedule M (Continued)

No.		Funds, June 30, 1937	Investment Income	Other Receipts	Expended or Transferred	Funds, June 30, 1938
FUNDS FOR RELIEF						
601	Edward Austin.....	\$444,340.98	\$20,202.00	.....	\$21,500.00	\$443,042.98
603	Thomas Wendell Bailey.....	2,739.52	122.85	\$10.00	125.00	2,747.37
604	¹ Charles Tidd Baker.....	31,521.79	1,433.25	.....	675.00	32,280.04
606	Levi Boles.....	11,148.22	505.05	.....	500.00	11,153.27
608	Bursar's Fund.....	†14,754.82	728.00	4,617.15	1,550.00	†18,549.97
610	Mabel Blake Case.....	27,398.70	1,246.70	.....	1,200.00	27,445.40
611	Chandler.....	4,736.96	213.85	.....	.....	4,950.81
612	Fred L. and Florence L. Coburn	5,261.82	241.15	.....	225.00	5,277.97
614	Coffin Memorial.....	42,245.00	2,330.00	.....	2,183.00	42,392.00
616	Dean's Fund.....	†4,748.57	227.50	780.58	965.00	†4,791.65
618	Carl P. Dennett.....	†796.01	36.40	.50	.....	†832.91
620	Dormitory Fund.....	4,078.14	186.55	.....	175.00	4,089.69
621	Frances and William Emerson..	101,697.77	4,595.50	.....	4,550.00	101,743.27
623	Norman H. George.....	95,635.06	4,368.00	.....	4,200.00	95,803.06
625	John A. Grimmons.....	†4,512.12	91.00	2,265.22	5,000.00	†1,868.34
627	James H. Haste.....	183,297.15	8,326.50	.....	8,200.00	183,423.65
629	David L. Jewell.....	26,580.17	1,228.50	.....	1,200.00	26,608.67
630	Llora Culver Krueger.....	5,419.97	245.70	.....	500.00	5,165.67
631	William B. Rogers.....	†39,037.35	1,820.00	2,539.39	2,000.00	†41,396.74
632	Summer Surveying Camp.....	†1,595.58	63.70	66.67	240.00	†1,485.95
634	Teachers' Fund.....	119,128.85	5,232.50	.....	11,000.00	113,361.35
635	Technology Loan Fund.....	†960,438.65	37,103.64	1,195.40	27,180.64	†971,557.05
637	Alice Brown Tyler.....	1,020.00	45.50	.....	.....	1,065.50
638	Samson R. Urbino.....	1,095.82	50.05	.....	50.00	1,095.87
639	Jonathan Whitney.....	609,454.74	25,201.15	624.05	30,071.50	605,208.44
640	Morrill Wyman.....	73,380.17	3,339.70	.....	3,300.00	73,419.87
		<u>\$2,816,063.93</u>	<u>\$119,184.74</u>	<u>\$12,098.96</u>	<u>\$126,590.14</u>	<u>\$2,820,757.49</u>

RECAPITULATION OF FUNDS**FOR GENERAL PURPOSES**

Restricted.....	\$26,121,692.61	\$1,215,819.61	\$1,273,771.47	\$2,026,811.25	\$26,584,472.44
Unrestricted.....	400,989.34	13,217.75	33,505.20	276,736.37	170,975.92

FOR DESIGNATED PURPOSES

Special Deposit Funds...	1,590,201.82	22,176.75	1,220,822.79	1,394,130.84	1,439,070.52
Salaries.....	163,332.18	7,434.70	5,000.00	7,434.70	168,332.18
Libraries, etc.....	184,405.01	8,258.25	90.10	9,992.23	182,761.13
Departments.....	1,732,117.22	75,930.40	10,000.00	101,300.42	1,716,747.20
Research.....	208,478.99	17,317.85	782,264.18	47,534.36	960,526.66
Fellowships.....	205,088.49	8,570.00	3,250.00	8,892.20	208,016.29
Scholarships.....	1,273,696.09	57,647.87	754.18	56,173.33	1,275,924.81
Prizes.....	29,689.41	1,488.20	10,000.00	922.77	40,254.84
Relief.....	2,816,063.93	119,184.74	12,098.96	126,590.14	2,820,757.49

Total.....	<u>\$34,725,755.09</u>	<u>\$1,547,046.12</u>	<u>\$3,351,556.88</u>	<u>\$4,056,518.61</u>	<u>\$35,567,839.48</u>
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(Schedule B) (Schedule B)

(Schedule D)

¹One-half of the income added to the principal.²See alphabetical listing and description of Funds on pages 184-196.

†Exclusive of student notes receivable. (See Schedule P.)

SCHEDULE P
STUDENT NOTES RECEIVABLE

<i>Fund</i>	<i>Notes Receivable June 30, 1937</i>	<i>Loans Made 1937-38</i>	<i>Loans Repaid 1937-38</i>	<i>Notes Receivable June 30, 1938</i>	<i>Interest Received 1937-38</i>
Technology Loan Fund...	\$738,242.70	\$119,556.00	*\$99,149.29	\$758,649.41	\$14,877.85
Bursar's Fund	9,802.52	1,550.00	4,243.97	7,108.55	373.18
Rogers Fund	6,438.43	.....	1,394.57	5,043.86	144.82
Dean's Fund	2,758.56	965.00	739.50	2,984.06	41.08
C.E. Summer Camp Fund	440.00	240.00	65.00	615.00	1.67
Grimmons Sch. Loan Fund	1,420.00	.....	.....	1,420.00	7.50
Dennett Fund	665.00	.....	.....	665.00	.50
Dean's Special Fund	150.00	.....	150.00	.....	6.62
G. H. May Sch. Fund....	3,450.00	650.00	25.00	4,075.00	.....
F. B. Tough Fund	100.00	.....	100.00	.....	11.66
Hygiene Special Fund....	3,778.83	174.00	75.00	3,877.83	.94
Class of 1898 Fund	300.00	.....	50.00	250.00	10.50
Class of 1896 Fund	750.00	250.00	.....	1,000.00	.....
Emerson Fund	550.00	.....	.....	550.00	.....
Chemical Engineering Fund	492.04	.....	111.35	380.69	.....
C. W. Eaton Fund	600.00	.....	.....	600.00	.....
Total	<u>\$769,938.08</u>	<u>\$123,385.00</u>	<u>\$106,103.68</u>	<u>\$787,219.40</u>	<u>\$15,476.32</u>

(Schedule D)

* Includes \$587.00 written off — two deceased borrowers.

SCHEDULE R CURRENT FUNDS

<i>Name</i>	<i>Balance June 30, 1937</i>	<i>Income</i>	<i>Other Increases or Transfers</i>	<i>Expenditures from Income or Balances</i>	<i>Other Expenditures or Transfers</i>	<i>Balance June 30, 1938</i>
Additional Group Ins. Fund	*\$235.15	\$7,769.35	.....	\$7,533.35	.....	\$ .85
Aeronautical Engineering						
Flying Instruction.....	.....	.....	¹ \$496.19	.....	\$496.19	.....
Bur. of Agi. Res.	*226.25	\$5,718.82	.....	4,853.50	1,000.00	*360.93
Spec. No. ¹ 1343.....	.....	191.93	¹ 1,500.00	191.93	1,500.00	.....
Summer Shop Course ..	659.49	.....	¹ 400.00	.....	353.30	706.19
Wind Tunnels.....	5,421.42	\$3,334.50	132.39	1,117.98	.....	7,770.33
Alcohol Res. No. 1175..	871.37	.....	¹ 500.00	400.55	500.00	470.82
No.1282 NewWind Tun.	*3,123.98	.....	² 21,046.66	.....	17,922.68	.....
No. 1282a Wind Tunnel						
Equip. — Carnegie.....	.....	.....	.....	1,028.21	.....	*1,028.21
Wind Tun. Equip. No. 1158	132.39	.....	.....	.....	132.39	.....
Hurricane Res.....	*274.54	925.00	¹ 1,500.00	645.47	1,500.00	4.99
Detonation Research...	.....	7,693.06	.....	5,097.17	1,440.00	1,155.89
Alumni Day 1937.....	792.55	.....	.....	792.55	.....	.....
Alumni Day 1938.....	.....	³ 4,178.27	² 1,000.00	4,178.27	1,000.00	.....
Alumni Fund Expenses —						
New Gym.....	.....	³ 4,634.95	² 50,000.00	4,634.95	46,000.00	4,000.00
Architecture:						
Travel. Scholarship ....	.....	.....	² 1,500.00	.....	1,500.00	.....
Special No. 1095.....	*2,582.92	.....	² 479.75	1,683.66	479.75	*4,266.58
Special No. 1095A.....	*1,169.72	.....	.....	18.70	.....	*⁵ 1,188.42
Biology — Food Research	4,710.76	330.00	¹ ² 2,398.69	591.21	.....	6,848.24
Ayer Company Research	*1,036.38	1,455.66	.....	419.28	.....	.....
Biocinema Research.....	1,587.52	.....	.....	.....	1,587.52	.....
Alba Research.....	950.99	.....	.....	77.30	873.69	.....
Health Education.....	869.78	2.00	² 1,587.52	292.72	1,000.00	1,166.58
Special Research.....	3,856.02	.....	.....	2,320.36	300.00	1,235.66
Rock. Vitamin Res.....	80.63	3,725.45	¹ ² 3,300.00	3,289.08	3,800.00	17.00
Special Research — Harris	.....	300.00	.....	300.00	.....	.....
Nat. Re. Council						
Grant 146.....	127.98	.....	.....	127.98	.....	.....
Emergency Comm. — Dis-						
placed Foreign Physicians	.....	450.00	.....	150.00	.....	300.00
Blue Cross Hospitalization	.....	2,999.90	.....	2,997.35	.....	2.55
Boat House Equipment ..	356.61	308.70	.....	401.40	.....	263.91
Building Key Account....	3,213.33	1,182.00	.....	1,037.29	1,000.00	2,358.04
Bus. and Eng. Administration:						
Case Research Account .	249.52	100.00	.....	340.56	.....	8.96
Graduate Fellow. Fund .	258.87	.....	.....	78.65	.....	180.22
Sloan Fellowship Fund .	25,000.00	.....	.....	15,641.00	9,177.19	181.81
J. R. Macomber Fund..	4.01	100.00	.....	98.17	.....	5.84
Special Fellowships ..	.....	.....	¹ ² 10,294.54	9,177.19	1,117.35	.....
Carnegie Pension Account	*4,803.20	60,144.44	.....	55,341.24	.....	.....
Catalogue 1937.....	5,986.50	104.74	² 43.03	6,134.27	.....	.....

* Overdraft.

¹ Appropriation from Current Income.² By Transfer.³ See Accounts Receivable.⁴ Account of Wellesley Property.⁵ Account of Wakefield Property.

Schedule R (Continued)

Name	Balance June 30, 1937	Income	Other Increases or Transfers	Expenditures from Income or Balances	Other Expenditures or Transfers	Balance June 30, 1938
Chemistry:						
Mass. Pharmaceutical Co.		\$969.39		\$219.39	\$750.00	
Special No. 1260.	\$2,000.00		\$9,700.00	1,825.98	9,700.00	\$174.02
Nat. Res. Council Grant	166.68			166.68		
Kellogg Graduate Fellow.			\$1,100.00			1,100.00
Special Res., Gilfillan ..	7.17			7.17		
Rockefeller Research.	2,755.85			770.09		1,985.76
Special No. 1065.	28.75		\$2.00	28.75	2.00	
Special No. 1324.			\$6,848.00		4,112.99	2,735.01
Chemical Cellulose Res.	*7,348.57	\$24,066.08		5,717.51	11,000.00	
Warren Fund — Schumb		300.00		201.23		98.77
A. A. A. & S. — Davis		274.50		90.50		184.00
Milas Lignin Research		500.00		3.84		496.16
Res.Lab.Phys.Chem.Royal	594.93					594.93
Chem. Eng.: Spec. Equip. ..	1,000.00					1,000.00
Fuels Res.	3,129.26				200.00	2,929.26
Special No. 1375		152.50	\$200.00	152.50	200.00	
No. 1207.	878.40		\$1,420.00	123.38	1,420.00	755.02
Special No. 1421.			\$250.00			250.00
Civil Engineering:						
Special No. 1364.			\$6,756.84		558.51	6,198.33
Soil Mechanics	470.03		\$1,000.00		686.85	783.18
Spec.No.1056,Chem.Res.	164.77		\$1,250.00	1,354.29		60.48
Special No. 1326			\$1,800.00		1,391.33	408.67
River Hydraulic Lab.	592.31		\$1,000.00		747.07	845.24
No. 913.	951.92		\$1,000.00	195.08	1,756.84	
No. 1068.	336.96			72.72	264.24	
Structural Lab.		492.75	\$1,894.44		1,731.97	655.22
U.S. Cape Cod. Can. Res.	93.35					93.35
Cosmic Terr. Res.	1,884.77	5,000.00		6,796.25		88.52
Crafts Library Fund.	439.94	50.00		10.41		479.53
Dean's Special Fund.	†261.10	171.62				†432.72
Dining Service Reserve.	3,794.53		\$4,277.44	3,324.96		4,747.01
Div.of Indus.Co-operation		\$74,003.15	\$5,142.01	74,003.15	5,142.01	
Economics: Industrial Relations						
No. 1280.	448.00		\$10,500.00		10,271.39	676.61
Electrical Engineering:						
A. E. I. C. Res.	3,215.33	11,000.00		5,585.41	5,663.31	2,966.61
VI-A Fund.	500.36		\$1,000.00	218.82	1,000.00	281.54
Humane Society of Mass.						
— Fog Research.		2,500.00		183.43	875.00	1,441.57
Fog Research — Navy	*6,250.63	7,500.00	\$3,550.00	905.07	3,550.00	344.30
Network Analyzer.	4,784.20	4,666.13		2,032.92	1,560.00	5,857.41
Rockefeller Research.	323.60	325.00		2.25		646.35
Spec. Res. — Timoshenko	188.39			101.93		86.46
Round Hill.	244.77		\$24.39			269.16
Carnegie Cosmic Ray ..	401.10			43.02		358.08
Account 4133.	306.92		\$500.00	761.01		45.91
Differential Analyzer.	120.20	70.00	\$2,400.00		1,825.50	764.70
Rapid Selection Res.					70.00	*70.00
Blind Landing Res.	*114.40	\$12,000.00		5,167.44	5,415.80	1,302.36

* Overdraft.

† Appropriation from Current Income.

* By Transfer.

* See Accounts Receivable.

† Exclusive of student notes receivable. (See Schedule P.)

Schedule R (Continued)

Name	Balance June 30, 1937	Income	Other Increases or Transfers	Expenditures from Income or Balances	Other Expenditures or Transfers	Balance June 30, 1938
Electrical Engineering (Continued)						
High Frequency Research	\$3.18				\$3.18	
Res. Corp. High Volt. Res.	149.33		\$1,250.00		843.91	\$555.42
Res. Corp. Dust Pre. Acct.		\$190.23		\$190.23		
Rock. Diff. Anal., No. 2.	4,954.50	\$29,243.44		26,839.36	5,819.92	1,538.66
Rock. Diff. Anal., No. 1176	961.13			961.13		
Special No. 1269			¹ \$1,003.18		585.99	417.19
Special No. 1182	19.47	3.00	¹ 1,200.00		1,080.00	142.47
Special No. 1240	108.07			108.07		
Special Nos. 1219, 1275	123.43		¹ \$6,000.00	3,736.24	1,000.00	1,387.19
Special No. 1250	7,546.44	1,481.50		4,559.10		4,468.84
Eng. Council for Prof. Dev.	\$83.14	\$1,042.99		959.85		
Engineering Research	672.27			597.24	75.03	
Genrado Trust	8,560.00	16,800.00		1,000.00	7,560.00	16,800.00
Geology, Rockefeller Res.	1,225.24			1,006.75		218.49
Special No. 1345			² 2,350.08		2,103.75	246.33
No. 913	40.21		² 2,275.00		2,315.21	
Age of Earth Research	\$465.63	\$5,776.75	² 1,500.00	2,177.76	4,633.36	
Special No. 242-38		2,000.00		1,315.98		684.02
Special No. 1060	484.73			449.86	34.87	
Special No. 1246	5,733.52			5,300.93		432.59
Spectrograph Account	3,040.00			1,099.39		1,940.61
Glass Industry Fellowship	1,000.00	1,500.00			2,000.00	500.00
Heat Engine Research	3,069.91		² 1,800.00	2,886.55	1,800.00	183.36
Historic Memorials	266.01			147.19		118.82
Housing Research	800.00					800.00
Hyams X-Ray Research		10,000.00		7,849.12		2,150.88
Hygiene Dept. Special	†1,522.68	79.44		239.00		†1,363.12
International Relations Lib.		300.00		110.43		189.57
Jour. of Math. and Physics	1,943.13	367.98		1,506.70		804.41
Keyes-Keenan Steam Table	521.23	1,200.00		1,601.62		119.61
A. D. Little Mem. Inc. Acct.	17,689.75	18,014.75	² 2,329.40	2,000.00	3,700.00	32,333.90
Library, Special No. 1	136.66	13.40		30.61		119.45
No. 1309			² 1,260.54		1,260.54	
No. 1336			² 200.00		200.00	
Markle Cyclotron Res.		30,000.00				30,000.00
Maclaurin Bio., No. 1245	1,050.00		² \$0.37	1,100.37		
Mathematics, No. 1256	424.60		² .40	424.60	.40	
Mechanical Engineering						
No. 1274	2,687.16			2,210.07	477.09	
No. 1254	572.85	325.00		826.96	11.37	59.52
Special Res.			² 3,000.00		1,525.38	1,474.62
No. 1177	293.09			289.15	3.94	
Quoddy Project	965.86			277.75		688.11
Torsiograph Acct.	\$241.30		² 241.30			
No. 1099 Air Cond.	\$110.74		² 4,000.00		2,176.01	1,713.25
A. S. M. E. Gear Res.	350.00	175.00		19.99		505.01
Applied Mech. Congress		74.38	² 2,000.00		253.42	1,820.96
Nat. Aero. W., No. 371	\$1,500.00	1,500.00				
Nat. Aero. W., No. 372	\$2,164.00	2,000.00	² \$587.09	405.93		17.16
Nat. Aero. W., No. 378	\$1,219.15	1,950.00		81.24	649.61	

* Overdraft.

¹ Appropriation from Current Income.² By Transfer.³ See Accounts Receivable.

† Exclusive of student notes receivable. (See Schedule P.)

Schedule R (Continued)

Name	Balance June 30, 1937	Income	Other Increases or Transfers	Expenditures from Income or Balances	Other Expenditures or Transfers	Balance June 30, 1938
Mechanical Engineering (Continued)						
Nat. Aero. W., No. 420.	*\$803.55	\$1,000.00	.....	\$108.87	\$87.58	.....
Nat. Aero. W., No. 464.	*232.35	2,000.00	*\$11.37	1,779.02	.....	.....
Nat. Aero. W., No. 465.	*264.12	\$1,700.00	.....	548.92	.....	\$886.96
Nat. Aero. W., No. 472.	*254.30	\$1,000.00	.....	145.70	600.00	.....
Navy Vibration Res., No. 2.....	*11,689.50	\$10,007.50	¹ \$2,250.20	326.90	241.30	.....
Strength of Mat. Equip. .....	.....	.....	\$2,500.00	.....	2,253.54	246.46
Spec. No. 1333 Vib. Res. .....	.....	.....	\$1,000.00	.....	971.65	28.35
Spec. No. 1366.....	.....	.....	\$1,200.00	.....	34.40	1,165.60
Metallurgy						
Special No. 1222.....	3,404.26	600.00	¹ \$2,000.00	3,801.14	2,000.00	203.12
Magnetic Res. — Power	375.00	1,125.00	.....	.....	.....	1,500.00
Phelps Dodge Fell.....	.....	1,350.00	.....	1,260.83	.....	89.17
Silver Research.....	1,488.88	.....	.....	1,139.23	.....	349.65
Special No. 1328.....	.....	.....	² 25,800.00	.....	25,041.45	758.55
Special No. 1337.....	.....	.....	¹ 2,800.00	.....	2,051.80	748.20
Special No. 1380.....	.....	.....	² 8,480.00	.....	2,312.31	6,167.69
Special No. 1354.....	.....	.....	¹ 500.00	.....	94.04	405.96
Mining Engineering						
Special No. 1259.....	1,057.75	9.00	² 1,246.95	2,033.77	.....	279.93
Special No. 1129.....	1,203.05	200.00	¹ 500.00	2,910.44	.....	*1,007.39
Ore Dressing.....	66.34	.....	.....	43.95	.....	22.39
American Welding Society Account.....	.....	200.00	.....	61.00	.....	139.00
Special, No. 1234.....	2,200.00	1,014.43	.....	2,958.51	.....	255.92
Penrose Fund.....	*98.06	1,103.09	.....	405.03	600.00	.....
Moore Lecture Fund.....	87.50	.....	.....	.....	.....	87.50
Museum Committee,						
Special No. 1238.....	3,133.80	.....	¹ \$6,456.95	1,848.16	6,456.95	1,285.64
Naval Architecture						
Special No. 1377 — Towing Tank.....	.....	.....	¹ \$2575.00	217.55	.....	357.45
Special No. 1340 — Propeller Testing.....	.....	15,000.00	.....	3,688.57	.....	11,311.43
Nuclear Research.....	*1,854.05	6,000.00	² 16,500.00	12,997.91	2,182.50	5,465.54
Placement Committee Fund	161.51	.....	.....	82.50	.....	79.01
Photographic Service.....	1,013.88	42,599.78	² 2,199.52	42,363.62	1,920.00	1,529.56
Photo. Lab. Fire —						
Ins. Acct.....	.....	433.25	.....	6.37	.....	426.88
Physics Department, Special						
Roentgen Ray.....	3.81	.....	² 1.63	3.81	1.63	.....
Hale Spectroscopic Fund	232.26	.....	.....	.....	.....	232.26
Rockefeller Special Res.	886.20	.....	² 16.30	600.00	.....	302.50
Special No. 1281.....	480.55	.....	.....	480.55	.....	.....
Milton Iodine Research	24.85	.....	.....	16.29	8.56	.....
Rumford, Harrison No. 3 .....	.....	3,000.00	.....	1,115.09	1,833.30	51.61
Rumford, Harrison No. 3	32.22	.....	² 20.64	52.86	.....	.....
Rumford, Harrison No. 4 .....	.....	400.00	.....	179.69	.....	220.31
Rumford, Hardy.....	120.72	.....	.....	.....	.....	120.72
Rumford, Stockbarger..	404.08	.....	.....	24.06	.....	380.02
Rumford, Evans No. 1..	162.30	.....	.....	162.30	.....	.....
Rumford, Evans No. 2..	89.65	.....	.....	89.65	.....	.....
No. 1290.....	.....	.....	¹ 500.00	.....	500.00	.....
No. 1291.....	.....	.....	¹ 520.00	.....	520.00	.....
Crystal Res.....	159.74	302.76	.....	232.45	.....	230.05

* Overdraft.

¹ Appropriation from Current Income.² By Transfer.³ See Accounts Receivable.

Schedule R (Continued)

Name	Balance June 30, 1937	Income	Other Increases or Transfers	Expenditures from Income or Balances	Other Expenditures or Transfers	Balance June 30, 1938
Nat. Res. Council No. 171		\$500.00		\$500.00		
Nat. Res. Council No. 151	\$500.72			500.72		
Spec. Special	878.57	1,350.45		320.89	\$800.00	\$1,108.13
Special Research — Boyce	218.55			202.25	16.30	
Special No. 1184	100.00	900.00			1,000.00	
President's Fund	789.16		\$2,000.00		1,863.00	926.16
R.O.T.C. Uniform Accts.	474.97	10,381.37	\$9.66	10,509.26	9.66	347.08
Research Assoc. of M.I.T.	972.62	35,050.00	5,000.00	760.00	40,262.62	
Res. Corp — Vitamin C. Res.		1,400.00		390.05	750.00	259.95
Res. Corp — Spec. Fellow.		700.00		583.89		116.11
Royalty Receipts —						
Patent 665135		476.19				476.19
Society of Arts			\$2,119.47		2,119.47	
Sailing Trophy Fund	275.00	25.00		215.50		84.50
Solar Energy Res.			\$1,700.00		4.70	1,695.30
Special Honoraria			\$1,000.00		1,000.00	
Special, News Bulletin			\$600.00		600.00	
Special, Open House, 1938			\$1,093.00		1,093.00	
Special, No. 1166	59.70	211.70		215.68		55.72
Special, No. 1174	229.66				229.66	
Special, No. 1197	144.58		\$19.02	144.58	19.02	
Special, No. 1204	3,661.86		\$4,184.04		7,845.90	
Special, No. 1237	29,070.41		\$59,094.46		88,164.87	
Special, No. 1249	3,865.43	3,149.00		6,537.78	476.65	
Special, No. 1263	\$936.98		\$12,200.62		11,263.64	
Special, No. 1293 and 1293A	54,070.16	67.00	\$21,400.00	74,454.42	1,082.74	
Special, No. 1294	\$1,520.66		143,896.81		142,376.15	
Special, No. 1297			\$450.00		450.00	
Special Research, No. 366	\$593.87	13,500.00		12,466.81		439.32
S.S. 1937 Publication Expense			\$899.69		899.69	
S.S. 1937 Spec. Conf.			\$1,500.00		1,500.00	
S.S. 1937 Spec. Conf.						
Publications			\$1,000.00		1,000.00	
Special, No. 1329 —						
Student Shop			\$21,150.00		1,116.37	33.63
Special, No. 1348			\$223.26		223.26	
Special, No. 1379			\$1,400.00		1,400.00	
Suspense Accounts	2,549.62		\$5,723.58	3,724.00	6,402.68	\$1,853.48
Suspense Acct. Worcester						
Property		1,609.12				1,609.12
Special No. 1402			\$56,220.49		5,611.04	50,609.45
Tech Loan Fund Committee			\$119,556.00		119,556.00	
Tech Loan Fund — Interest			\$14,877.85		14,877.85	
Tech Loan Fund — Prin.			\$98,562.29		98,562.29	
Textile Res. School		1,200.00		1,087.71	112.29	
Tree Planting Special		3,720.00		3,720.00		
Tucker, Ross Francis						
Memorial Fund		200.00				200.00
Tyler Portrait Fund		559.64				559.64
Undergraduate Dues	64.54		\$20,314.00		20,046.94	331.60
U.S. Gov't Torpedo Res.		\$862.81	\$1,637.19	862.81	1,637.19	
Visual Education Account	16.56			6.86	9.70	
Walker Memorial Library	261.60	11.95	\$2,800.00	174.05	2,800.00	99.50
Water Cooler Research	\$18.00	740.53	\$440.00	722.53	440.00	
Totals	\$215,904.70	\$539,387.32	\$844,991.24	\$513,150.22	\$830,021.54	\$257,111.50

* Overdraft.

† Appropriation from Current Income.

* By Transfer.

* See Accounts Receivable.

(Schedule B)

(Schedule C)

(Schedule D)

SCHEDULE S**CURRENT SURPLUS**

Surplus, June 30, 1937	\$713.36
Net Increase (Schedule A)	645.67
Surplus, June 30, 1938 (Schedule D)	\$1,359.03

PROFIT AND LOSS ACCOUNT**LOSSES AND CHARGES:**

Students' Accounts charged off	\$280.85
Appropriation Adjustment	50.37
Total	\$331.22

GAINS AND CREDITS:

Premium Refund, Employees Insurance	\$2,614.80
Appropriation Adjustment, a/c Publications, 1936-37	3,661.86
Appropriation Adjustment, a/c Am. Inst. of Physics	1,000.00
a/c Unclaimed Building Key Deposits	1,000.00
Miscellaneous Credits	1,070.00
Total	\$9,346.66
Net Gain (Schedule A)	\$9,015.44

THE ENDOWMENT FUNDS OF THE INSTITUTE

(Alphabetically listed — see listing by groups on pages 40-46 with corresponding reference numbers, showing transactions during the year and balances as of June 30, 1938.)

- 212 ALBERT FUND, 1930-38, \$22,500. Gifts from anonymous donor to pay eleven years rental of M. I. T. Student House on Bay State Road, Boston.
- 214 ALPHA CHI SIGMA HOUSE FUND (Alpha Zeta Chapter), 1935, \$2,340.96. Deposited for investment purposes only.
- 216 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.
- 501 ELISHA ATKINS SCHOLARSHIP FUND, 1894, \$5,000. Bequest of Mary E. Atkins.
- 401 WILLIAM PARSONS ATKINSON FUND, 1918, \$13,000. Bequest of Charles F. Atkinson as a memorial to father — for English Department of the Institute.
- 601 EDWARD AUSTIN FUND, 1899, \$400,000. Bequest. Interest paid to needy, meritorious students and teachers to assist in payment of studies.
- 580 BABSON FUND, 1938, \$10,000. Gift of Babson's Statistical Organization, Inc. Income to be applied at intervals of not more than three years as prizes for one or more persons for certain studies and research in Economics.
- 603 THOMAS WENDELL BAILEY FUND, 1914, \$2,200. Bequest. Income used for rendering assistance to needy students in Department of Architecture.
- 604 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.
- 175 EDMUND DANA BARBOUR FUND, 1926, \$847,000. Bequest. Principal and income for general purposes of Institute. Over \$800,000 used for buildings and equipment.
- 321 WALTER S. BARKER FUND, 1927, \$10,000. Bequest. Income only available for purposes of the Library.
- 220 BASKET BALL FUND. Excess receipts from Eastern Massachusetts basket ball competitions held for account of M. I. T. A. A. for investment purposes only.
- 222 BESS BIGELOW FUND, 1936-38, \$25,000. Anonymous donation for special purposes subject to approval of President.
- 503 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.
- 103 GEORGE BLACKBURN MEMORIAL FUND, 1931-1936, \$907,000. Bequest of Harriette A. Nevins. Income for general purposes.
- 581 ROBERT A. BOIT FUND, 1921, \$5,000. Bequest. Income to stimulate students' interest in best use of English Language through annual prizes or scholarships.
- 403 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.

- 606 LEVI BOLES FUND, 1915, \$10,000. Bequest of Frank W. Boles in memory of father. Income for assistance of needy and deserving students.
- 463 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.
- 504 JONATHAN BOURNE FUND, 1915, \$10,000. Bequest of Hannah B. Abbe. Income to aid deserving students.
- 505 ALBERT G. BOYDEN FUND, 1931-37, \$580,772. Bequest. Estate of Elizabeth R. Stevens. Income for scholarships. Preference to students from Fall River and Swansea, Mass.
- 506 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.
- 464 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.
- 608 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.
- 443 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.
- 610 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.
- 508 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.
- 405 WILLIAM E. CHAMBERLAIN FUND, 1917-19, \$6,000. Bequest. Income used for Department of Architecture.
- 611 CHANDLER FUND, 1927-36, \$4,511. Gift from Architectural Society. A loan fund to be administered by Head of Architectural Department.
- 407 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.
- 323 EDNAH DOW CHENEY FUND, 1905-06, \$13,900. Bequest. Income for maintenance and care of Margaret Cheney Room for women students.
- 105 CHARLES CHOATE FUND, 1906-21, \$35,800. Bequest. Income for general purposes.
- 325 FRANK HARVEY GILLEY 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.
- 511 LUCIUS CLAPP FUND, 1905, \$4,900. Bequest. Income to worthy students who may not be able to complete their studies without help.
- 273 CLASS OF 1874 FUND, 1934, \$180. Held subject to use by Class of 1874.

- 513 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.
- 270 CLASS OF 1898 FUND, \$5,535. By subscription of certain members of class from 1927-1931. Income only for scholarship loans, as authorized by committee of class.
- 583 CLASS OF 1904 FUND, 1925, \$392. Contributions received by Professor Gardner for Architectural Department prizes.
- 514 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.
- 266 CLASS OF 1917. SPECIAL, 1937, \$100. For deposit only.
- 268 CLASS OF 1934 FUND, SPECIAL. Held for investment purposes only.
- 515 CLASS OF 1938 SCHOLARSHIP FUND, 1938, \$165. Gift of Class of 1938. Income for scholarships.
- 225-239 inc.

CLASS 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.

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.

- 301 SAMUEL C. COBB FUND, 1916, \$36,000. Bequest. Income for salaries of President and professors.
- 612 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.
- 614 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.
- 466 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.
- 245 COSMIC TERRESTRIAL RESEARCH FUND, 1938, \$19,200. Gift (anonymous) for special research.
- 444 CRANE AUTOMOTIVE FUND, 1928, \$5,000. Gift of Henry M. Crane. Reserved for purchase of further equipment for Aeronautical Laboratory when necessary.
- 516 LUCRETIA CROCKER FUND, 1916, \$50,000. Bequest of Matilda H. Crocker. Income for establishment of scholarships for women in memory of sister.
- 409 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.
- 468 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.
- 517 ISAAC W. DANFORTH FUND, 1903, \$5,000. Bequest of James H. Danforth. Income for scholarship purposes as a memorial to brother.

- 176 N. LORING DANFORTH FUND, 1937, \$5,000. Bequest. Principal and income for general purposes.
- 616 DEAN'S FUND, 1924, \$3,350. Contributions. To be loaned by Dean to needy students.
- 618 CARL P. DENNETT FUND, 1926, \$500. Gift. To be loaned to students, preferably Freshmen, at discretion of President.
- 520 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.
- 620 DORMITORY FUND, 1903, \$2,700. Contributions. Income for scholarship purposes.
- 411 SUSAN E. DORR FUND, 1914, \$95,000. Bequest. Income for use and benefit of Rogers Physical Laboratory.
- 248 DRAMA CLUB THEATRE FUND, 1938, \$400. Deposited by Drama Club of M. I. T. toward future purchase of theatrical equipment.
- 107 EBEN S. DRAPER FUND, 1915, \$100,000. Bequest. Income used for general purposes of the Institute.
- 521 THOMAS MESSINGER DROWN FUND, 1928, \$50,000. Bequest of Mary Frances Drown. Income to establish scholarships for deserving undergraduate students.
- 109 COLEMAN DU PONT FUND, 1931-1938, \$216,000. Bequest. Income for support and maintenance of the Institute.
- 177 PIERRE DU PONT FUND, 1938, \$25,000. Gift. For special purposes.
- 469 DU PONT DE NEMOURS FUND. For graduate scholarship in Chemical Engineering.
- 111 EASTMAN CONTRACT FUND, 1924, \$9,500,000. Gift of George Eastman. Income for general purposes of the Institute.
- 113 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.
- 412 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.
- 115 CHARLES W. EATON FUND, 1929, \$243,000. Bequest. Income for advancement of general purposes of Institute.
- 117 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.
- 119 MARTHA ANN EDWARDS FUND, 1890, \$30,000. Gift. Income for general purposes.
- 621 FRANCES AND WILLIAM EMERSON FUND, 1930, \$100,000. Gift. Income for aid of regular and special students in Department of Architecture.
- 178 F. W. EMERY FUND. Balance received from sale of real estate received in 1916. Previous amount received used for equipment and other purposes.
- 121 WILLIAM ENDICOTT FUND, 1916, \$25,000. Bequest. Income for general purposes.

- 210 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.
- 179 ARTHUR F. ESTABROOK FUND, 1923-38, \$100,800. Bequest. Used for purchase of land and equipment.
- 524 FARNSWORTH FUND, 1889, \$5,000. Bequest of Mary E. Atkins. Income for scholarships.
- 180 HENRIETTA G. FITZ FUND, 1930, \$10,000. Bequest. Income for general purposes.
- 526 CHARLES LEWIS FLINT FUND, 1889, \$5,000. Bequest. Income for support of worthy student, preference given graduate of English High School, Boston.
- 327 CHARLES LEWIS FLINT FUND, 1889, \$5,000. Bequest. Income for purchase of books and scientific publications for library.
- 303 SARAH H. FORBES FUND, 1901, \$500. Gift of Malcolm Forbes as memorial to mother. Income for salaries.
- 527 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.
- 123 FRANCIS APPLETON FOSTER FUND, 1922, \$1,000,000. Bequest. Income for purposes of Institute.
- 125 JOHN W. FOSTER FUND, 1938, \$299,650. Bequest. Income for purposes of the Institute.
- 127 ALEXIS H. FRENCH FUND, 1930, \$5,000. Bequest. Income for general purposes of Institute.
- 129 JONATHAN FRENCH FUND, 1915-16, \$25,000. Bequest of Caroline L. W. French. Income for purposes of the Institute.
- 131 HENRY CLAY FRICK FUND, 1925-38, \$1,831,000. Bequest. Institute received ten shares of a total of one hundred shares of his residuary estate. Income for general purposes.
- 529 FUEL AND GAS SCHOLARSHIP FUND, 1925-26, \$700. Gift Boston Consolidated Gas Company and Massachusetts Gas Companies for scholarship in Gas Engineering.
- 305 GEORGE A. GARDNER FUND, 1898, \$20,000. Gift. Income for salaries of instructors.
- 133 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).
- 623 NORMAN H. GEORGE FUND, 1919-25, \$93,400. Bequest. Income for assistance of worthy and needy students.
- 135 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.
- 625 JOHN A. GRIMMONS FUND, 1930-38, \$23,405. 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.

- 181 GEORGE WYMAN HAMILTON FUND, 1935, \$54,414.15. Bequest. Principal and income for general purposes of the Institute.
- 627 JAMES H. HASTE FUND, 1930, \$181,000. Bequest. Income for aid of deserving students of insufficient means.
- 136 CHARLES HAYDEN FUND, 1937, \$1,000,000. Bequest of Charles Hayden. Income for general educational purposes of the Institute.
- 309 JAMES HAYWARD FUND, 1866, \$18,800. Bequest. Income for salaries.
- 183 JAMES W. HENRY FUND, 1935, \$8,226. Bequest. To be used by Institute in manner deemed best.
- 531 GEORGE HOLLINGSWORTH FUND, 1916, \$5,000. Bequest of Rose Hollingsworth. Income used for scholarship.
- 585 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.
- 185 ABBY W. HUNT FUND, 1936-38, \$76,000. Bequest. For general purposes. \$60,000 used for alterations, 1937.
- 533 T. STERRY HUNT FUND, 1894, \$3,000. Bequest. Income to a student in Chemistry.
- 534 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.
- 211 INCOME EQUALIZATION RESERVE FUND, 1937. Created by appropriation of excess income from general investments for year 1936-37 toward maintenance of income for ensuing years.
- 187 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 Cooperation and other special projects.
- 250 INDUSTRIAL RELATIONS FUND, 1938, \$42,100. Contributions from Industrial organizations in support of the Industrial Relations Section of the Department of Economics.
- 137 JAMES FUND, 1898-99, \$163,000. Bequest of Julia B. H. James. Income for development of M. I. T.
- 629 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.
- 474 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.
- 536 JOY SCHOLARSHIPS, 1886, \$7,500. Gift of Nabby Joy. Income for scholarships for one or more women studying natural science at M. I. T.
- 341 WILLIAM HALL KERR FUND, 1896, \$2,000. Gift of Alice M. Kerr. Income for the annual purchase of books and drawings in machine design.
- 630 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.
- 476 WILFRED LEWIS FUND, 1930, \$5,000. Gift of Emily Sargent Lewis. Income for maintenance of graduate student in Mechanical Engineering.

- 538 WILLIAM LITCHFIELD FUND, 1910, \$5,000. Bequest. Income for scholarship on competitive examination.
- 414 ARTHUR DEHON LITTLE MEMORIAL FUND, 1937, \$46,600. Bequest under will of Dr. A. D. Little. Income to be used in Departments of Chemistry and Chemical Engineering. (In addition, the income from 5,543 shares of common stock of A. D. Little, Inc., held by Voting Trustees for the benefit of the Institute under declaration of trust dated November 18, 1936 and in force for twenty years is available for use in these two departments.
- 189 HIRAM H. LOGAN FUND, 1933-38, \$19,455. Bequest. Principal and income for general purposes of M. I. T.
- 539 ELISHA T. LORING FUND, 1890, \$5,000. Bequest. Income for assistance of needy and deserving pupils.
- 265 LOUISVILLE TECHNOLOGY FOUNDATION FUND, 1935, \$50. Founded by Louisville Tech Club toward scholarship aid for local student.
- 541 LOWELL INSTITUTE FUND, 1923, \$2,300. Gift from alumni of Lowell Institute to establish scholarship for its graduates.
- 139 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.
- 542 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).
- 311 WILLIAM P. MASON FUND, 1868, \$18,800. Bequest. Income to support a professorship in the Institute.
- 143 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.
- 263 M. I. T. ALUMNI ASSOCIATION PERMANENT FUND, 1929-38. Deposited with M. I. T. for investment purposes only.
- 260 M. I. T. TEACHERS' INSURANCE FUND, 1926-38. Balance of 2 per cent salary deductions under M. I. T. Pension and Insurance Plan in excess of Group Insurance Premiums paid.
- 261 M. I. T. TEACHERS' INSURANCE FUND, SPECIAL, 1928-38. 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.
- 416 JOHN LAWRENCE MAURAN FUND, 1934, \$10,000. Bequest. Principal and income may be used for benefit of Department of Architecture.
- 417 GEORGE HENRY MAY FUND, 1914, \$4,250. Gift. Income for benefit of Chemical Department.
- 543 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.
- 141 THOMAS MCCAMMON FUND, 1930, \$15,000. Bequest in honor of father, James Elder McCammon. Income available for general purposes.
- 587 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.

- 418 METALLURGY, SPECIAL FUND, 1938, \$10,000. Subscription (anonymous) toward equipment fund of Department of Metallurgy.
- 419 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.
- 545 JAMES H. MIRPLES FUND, 1886, \$2,500. Gift of James Buchanan Mirplees. Income to such student in third or fourth year Mechanical Engineering most deserving pecuniary assistance.
- 420 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.
- 478 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.
- 145 KATE M. MORSE FUND, 1925, \$25,000. Bequest. Income for general purposes of M. I. T.
- 147 EVERETT MORSS FUND, 1934, \$25,000. Bequest. Income for general purposes of M. I. T.
- 264 HENRY A. MORSS NAUTICAL FUND, 1937, \$3,500. Gift for maintenance of sailing activities and sailing pavilion.
- 218 NEW BUILDING FUND, 1937, \$100,000. Received on account of sale of Boylston Street property. To be used for new building addition.
- 547 NICHOLS FUND, 1895, \$5,000. Bequest of Betsy F. W. Nichols. Income for scholarship to student in Chemistry.
- 548 CHARLES C. NICHOLS FUND, 1904, \$5,000. Bequest. Income for scholarship.
- 422 WILLIAM E. NICKERSON FUND, 1928, \$50,000. Gift. Principal and income used to finance chair in Humanities.
- 193 MOSES W. OLIVER FUND, 1921, \$11,000. Bequest.
- 343 GEORGE A. OSBORNE FUND, 1928, \$10,000. Bequest. Income for benefit of mathematical library.
- 550 JOHN FELT OSGOOD FUND, 1909, \$5,000. Bequest of Elizabeth P. Osgood in memory of husband. Income for scholarship in Electricity.
- 551 GEORGE L. PARMELEE FUND, 1921, \$17,000. Bequest. Income for tuition of either special or regular worthy students.
- 195 EMERETTE O. PATCH FUND, 1935, \$7,500. Bequest. Principal or income for general purposes.
- 149 RICHARD PERKINS FUND, 1887, \$50,000. Bequest. Income for general purposes.
- 552 RICHARD PERKINS FUND, 1887, \$50,000. Bequest. Income for scholarships.
- 480 WILLARD B. PERKINS FUND, 1898, \$6,000. Bequest. Income to be expended every fourth year for travelling scholarship in architecture.
- 424 EDWARD D. PETERS FUND, 1924, \$5,000. Bequest of Elizabeth W. Peters. Income for the Department of Mineralogy.
- 197 PRESTON PLAYER FUND, 1933, \$20,000. Bequest. For general purposes, unrestricted.

- 425 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.
- 199 CHARLES O. PRESCOTT, 1935, \$30,640.78. Principal and income for general purposes of the Institute.
- 482 PROCTOR FUND, 1929-38. Gift annually from Redfield Proctor for fellowship in Physics.
- 275 PROFESSORS' FUND, 1931-37. 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.
- 484 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.
- 150 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.
- 553 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.
- 278 RICHARDS PORTRAIT FUND, 1929. Balance of subscriptions from friends of Prof. R. H. Richards for portrait completed — available for Mining Department.
- 449 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.
- 451 CHARLOTTE B. RICHARDSON FUND, 1891, \$30,000. Bequest. Income to support of Industrial Chemical School.
- 554 JOHN ROACH SCHOLARSHIP FUND, 1937, \$3,000. Bequest under will of Emeline Roach, income to provide annual scholarship to needy and deserving student in Naval Architecture and Marine Engineering.
- 280 ROCKEFELLER FOUNDATION RESEARCH FUND, 1931-36, \$170,000. Contributed for Research in Science Department over period of five years.
- 313 HENRY B. ROGERS FUND, 1873, \$25,000. Gift. Income for salaries of one or more professors or instructors.
- 486 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.
- 201 ROBERT E. ROGERS FUND, 1886, \$7,600. Bequest in memory of brother, William B. Rogers. For general purposes.
- 631 WILLIAM BARTON ROGERS FUND. Present, \$39,000. 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.

- 151 WILLIAM BARTON ROGERS MEMORIAL FUND, 1883-84-85, \$250,000. Contributions from 91 persons. Income for support of Institute.
- 452 WILLIAM BARTON AND EMMA SAVAGE ROGERS FUND, 1937, \$102,064.18. Bequest of Dr. Francis H. Williams. Income to be added to principal for twenty years — after which eighty (80) per cent of income may be used for research in pure science — balance to be added to fund.
- 426 FRANCES E. ROPER FUND, 1936, \$2,000. Bequest. Income for use in Department of Mechanical Engineering.
- 345 ARTHUR ROTCH ARCHITECTURAL FUND, 1895, \$5,000. Bequest. Income for Library or collection of Department of Architecture.
- 427 ARTHUR ROTCH FUND, 1895, \$25,000. Bequest. Income for general purposes of Department of Architecture.
- 589 ARTHUR ROTCH FUND, 1895, \$5,000. Bequest. Income for annual prize to student in regular course in Architecture graduating highest in class.
- 591 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.
- 555 WILLIAM PATRICK RYAN MEMORIAL FUND, 1935, \$3,637. Contributed by friends of Professor Ryan. Income for scholarship in Chemical Engineering.
- 281 WILLIAM PATRICK RYAN SPECIAL FUND, 1933, \$3,000. Appropriation. Educational fund for three children of late Prof. W. P. Ryan.
- 152 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.
- 490 HENRY SALTONSTALL FUND, 1901, \$10,000. Bequest. Income to aid one or more needy students.
- 492 JAMES SAVAGE FUND, 1873, \$10,000. Bequest. Income for scholarships in institution "where my son-in-law, William B. Rogers, is President."
- 153 SAMUEL E. SAWYER FUND, 1895, \$4,700. Bequest. Income to be used in such manner as will best promote interests of M. I. T.
- 556 JOHN P. SCHENKL FUND, 1922, \$43,800. Bequest of Johanna Pauline Schenkl in memory of father. Income for scholarships in Department of Mechanical Engineering.
- 282 THEODORE EDWARD SCHWARZ MEMORIAL FUND, 1937, \$3,170. Gift. For equipment of a suitable room for proposed map collection.
- 283 SEDGWICK MEMORIAL LECTURE FUND, 1930-38, \$9,500. 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.
- 429 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.
- 557 THOMAS SHERWIN FUND, 1871, \$5,000. Gift of Committee on Sherwin Memorial Fund for free scholarship to graduate of English High School.
- 493 SLOAN FUND, 1933-38, \$1,000. Annual gift of A. P. Sloan, Jr. for Fellowship in Automotive Engineering.

- 203 ELLEN VOSE SMITH FUND, 1930, \$25,000. Bequest.
- 558 HORACE T. SMITH FUND, 1930, \$32,988.76. Bequest. Income for scholarships. Preference to graduates of East Bridgewater (Mass.) and Bridgeport (Conn.) High Schools.
- 284 LILLIE C. SMITH FUND, 1937, \$4,800. Bequest to M. I. T. Women's Association for purposes of the Association.
- 453 SOLAR ENERGY FUND, 1938, \$647,700. Gift of Dr. Godfrey L. Cabot. Principal to be held for fifty years — income to be used in development of the art of converting energy of the sun to use of man by mechanical, electrical or chemical means. After fifty years, fund becomes part of general unrestricted endowment of the Institute.
- 559 SONS AND DAUGHTERS OF NEW ENGLAND PURITAN COLONY SCHOLARSHIP FUND, 1931, \$600. Gift. Income for scholarship aid to a boy of New England ancestry.
- 155 ANDREW HASTINGS SPRING FUND, 1921, \$50,000. Bequest of Charlotte A. Spring in memory of nephew as a permanent fund. Income for general purposes.
- 593 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.
- 632 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.
- 454 HENRY N. SWEET, 1936, \$8,036.50. Bequest. For industrial research.
- 157 SETH K. SWEETSER FUND, 1915, \$25,000. Bequest as a permanent fund. Income for general purposes.
- 495 SUSAN H. SWETT FUND, 1888, \$10,000. Bequest. Income to support a graduate scholarship.
- 496 GERARD SWOPE FUND, 1926, \$2,500. Gift for fellowships in Electrical Engineering.
- 634 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.
- 635 TECHNOLOGY LOAN FUND, 1930–1937, \$1,435,720.18. Contributed by eighteen alumni to provide loans for students.
- 285 TECHNOLOGY MATRONS TRUST FUND, 1916–22–31, \$8,500. Gifts of Mrs. F. Jewett Moore. Income for social activities of Technology Matrons.
- 456 TEXTILE RESEARCH FUND, 1937, \$3,065. Gift. For research.
- 315 NATHANIEL THAYER FUND, 1868, \$25,000. Gift. Income for professorship of Physics.
- 286 W. B. S. THOMAS FUND, 1935–37, \$2,000. Gift of parents of W. B. S. Thomas '29, the income only to be expended for benefit of M. I. T. A. A.
- 317 ELIHU THOMSON FUND, 1933–37, \$18,000. Contributed toward fund for Professorship in Electrical Engineering.
- 497 FRANK HALL THORP FUND, 1932, \$10,000. Anonymous gift. Income for fellowship in Industrial Chemistry.
- 560 SAMUEL E. TINKHAM FUND, 1924, \$2,400. Gift of Boston Society of Civil Engineers. Income to assist worthy student in Civil Engineering.

- 349 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.
- 562 F. B. TOUGH FUND, 1924, \$465. Gift to extend financial assistance to worthy students in mining or oil production.
- 431 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.
- 637 ALICE BROWN TYLER FUND, 1937, \$1,000. Gift of Prof. and Mrs. H. W. Tyler. Income to be used for benefit of women students at the Institute.
- 290 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.
- 292 UNDERGRADUATE PUBLICATIONS TRUST FUND, 1935, \$16,018. Deposited by Alumni Advisory Council on Publications for investment purposes only.
- 294 UNDERGRADUATE DUES RESERVE FUND, ATHLETICS, 1924-37. Transferred from Undergraduate Dues (current operating account) to secure investment income.
- 296 UNDERGRADUATE DUES RESERVE FUND, CONTINGENT, 1924-37. Transferred from Undergraduate Dues (current operating account) to secure investment income.
- 433 WILLIAM LYMAN UNDERWOOD FUND, 1932, \$16,252. Bequest. For benefit of Biological Department or otherwise for general purposes.
- 563 SUSAN UPHAM FUND, 1892, \$1,000. Gift. Income to assist students deserving financial aid.
- 638 SAMSON R. URBINO FUND, 1927, \$1,000. Bequest. Income for students who need assistance, Germans preferred.
- 351 THEODORE N. VAIL FUND, 1925, \$24,000. Bequest. Income for benefit of Vail Library.
- 498 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.
- 565 VERMONT SCHOLARSHIP FUND, 1924-37, \$25,000. 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.
- 567 ANN WHITE VOSE FUND, 1896, \$60,000. Bequest. Income for free scholarships for young men of American origin.
- 569 ARTHUR M. WAITT FUND, 1925, \$9,700. Bequest. Income for deserving students in second, third and fourth year classes in Mechanical Engineering.
- 159 WILLIAM J. WALKER FUND, 1915-17, \$23,000. Bequest. Income for general purposes.
- 161 HORACE HERBERT WATSON FUND, 1930, \$34,000. Bequest of Elizabeth Watson Cutter as a permanent fund. Income for general purposes.

- 205 FRANK G. WEBSTER FUND, 1931, \$25,000. Bequest. For general purposes.
- 571 LOUIS WEISBEIN FUND, 1915, \$4,000. Bequest. Income for scholarship for student in Architectural Department, preference to be given to a Jewish boy.
- 163 ALBION B. K. WELCH FUND, 1871, \$5,000. Bequest as a permanent fund. Income for general purposes.
- 165 EVERETT WESTCOTT FUND, 1935-38, \$171,394. Bequest as a permanent fund. Income for general purposes.
- 167 MARION WESTCOTT FUND, 1938, \$238,200. Bequest for endowment. Income for general purposes.
- 573 FRANCES ERVING WESTON FUND, 1912, Bequest. Received annually to aid a native-born American Protestant girl of Massachusetts. (Principal \$5,000 turned over to M. I. T., 1931.)
- 574 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., 1931.)
- 576 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.
- 458 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.
- 639 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.
- 196 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.
- 577 ELIZABETH BABCOCK WILLMANN FUND, 1935, \$5,065. Bequest. Income to be used toward tuition of young women students taking Chemistry courses.
- 171 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.
- 640 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.
- 459 WRIGHT MEMORIAL WIND TUNNEL, 1937-38, \$79,500. Contributed by friends for construction of new wind tunnel.

AUDITORS' CERTIFICATE

We have made an examination of the books and accounts of the Treasurer and the Bursar of the Massachusetts Institute of Technology for the year ended June 30, 1938, and we report thereon as follows:

The investment securities in the custody of the Old Colony Trust Company of Boston, Massachusetts, were examined by us on June 30, 1938; we also checked the investment accounts in detail with lists of securities certified by the Old Colony Trust Company at that date, and by examination or test of the accounts and supporting records we 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 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, 1938, and the financial operating 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 securities of the Hewett Fund and of the Massachusetts Institute of Technology Pension Association in the custody of the Old Colony Trust Company were also examined by us on June 30, 1938, and the respective investment accounts were also checked in detail with lists of securities certified by the Old Colony Trust Company at that date.

Respectfully submitted,

PATTERSON, TEELE & DENNIS,

Accountants and Auditors.

1 Federal Street, Boston, August 15, 1938.

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, 1938, and we submit herewith their certificate dated August 15, 1938.

Their full report covers the books of the Massachusetts Institute of Technology, the Hewett Fund, of which the Massachusetts Institute of Technology acts as Trustee and also the accounts of the Massachusetts Institute of Technology Pension Association.

Respectfully submitted,

HOVEY T. FREEMAN, *Chairman,*
FRANK D. GOMERFORD,
JOSEPH W. POWELL.

Providence, R. I., August 19, 1938.

PERIODICAL PUBLICATIONS, BOOKS AND REVIEWS BY MEMBERS OF THE STAFF

AERONAUTICAL ENGINEERING

1. CALDWELL, FRANK W. *Propellers for Aircraft Engines of High Power Output.* (Trans. Lilienthal Gesellschaft, December 1, 1937.)
2. DRAPER, CHARLES S. *The Sonic Altimeter for Aircraft.* (N.A.C.A. Technical Note No. 611, August 1937.)
3. DRAPER, CHARLES S., BENTLEY, G. P. and WILLIS, H. H. *Vibration Measurements in Flight.* (S. A. E. Jour., September 1937.)
4. DRAPER, CHARLES S. *Acoustics of the Combustion Chamber.* (Phys. Rev. 53, p. 108, March 1938.)
5. DRAPER, CHARLES S. *Pressure Waves Accompanying Detonation in the Internal Combustion Engine.* (J. Aero. Sci., April 1938.)
6. HOUGHTON, HENRY G. *Problems Connected with the Condensation and Precipitation Processes in the Atmosphere.* (Bull. Am. Meteorological Soc. 19, pp. 152-159, April 1938.)
7. ISELIN, COLUMBUS O'D. *Problems in the Oceanography of the North Atlantic.* (Nature 141, p. 772, April 30, 1938.)
8. NAMIAS, JEROME. *Thunderstorm Forecasting with the Aid of Isentropic Charts.* (Bull. Am. Meteorological Soc. 19, pp. 1-14, January 1938.)
9. NEWELL, JOSEPH S. and NILES, ALFRED S. *Airplane Structures, Vol. I and II.* (John Wiley Sons, April 1938.)
10. OBER, SHATSWELL. *Speculations on Propellers for Stratosphere Airplanes.* (J. Aero. Sci. 4, p. 463, September 1937.)
11. PETERS, HEINRICH and REISSNER, ERIC. *A Contribution to the Theory of Turbulence.* (J. Aero. Sci. 4, pp. 384-385, July 1937.)
12. REISSNER, ERIC. *Freie u. erzwungene Torsionsschwingungen d. elastischen Halbraumes.* (Ingenieur-Archiv 8, pp. 229-245, August 1937.)
13. REISSNER, ERIC. *Remark on the Theory of Bending of Plates of Variable Thickness.* (J. Math. and Phys. 16, pp. 43-45, October 1937. Also Norske Vidensk. Selsk. Forhandlinger 10, pp. 97-99, December 1937.)
14. REISSNER, ERIC. *On the Problem of Stress Distribution in Wide-Flanged Box-Beams.* (J. Aero. Sci. 5, pp. 295-299, June 1938.)
15. ROSSBY, CARL-GUSTAV A. and Collaborators. *Isentropic Analysis.* (Bull. Am. Meteorological Soc. 18, June-July 1937.)
16. ROSSBY, CARL-GUSTAV A. and Collaborators. *Aerological Evidence of Large-Scale Mixing in the Atmosphere.* (Trans. Am. Geophys. Union, Eighteenth Annual Meeting, July 1937.)
17. ROSSBY, CARL-GUSTAV A. *On the Mutual Adjustment of Pressure and Velocity Distributions in Certain Simple Current Systems.* (Sears Foundation J. Mar. Res. 1, November 1937.)
18. WILLETT, HURD C. *The Importance of Observations from the Upper Atmosphere in Long Range Weather Forecasting.* (J. App. Phys. 8, p. 807, December 1937.)

DEPARTMENT OF ARCHITECTURE

19. ADAMS, FREDERICK J. *Academic Aspects of Planning.* (Planning Forum 2, p. 14, January 1938.)

20. ADAMS, FREDERICK J. *The Development of Government Participation in Low Rental Housing*. (The Commonwealth 25, p. 123, April-June 1938.)
21. CHAMBERLAIN, SAMUEL. *Beyond the New England Thresholds*. (Hastings House, New York, July 1937.)
22. CHAMBERLAIN, SAMUEL. *Frank W. Benson, the Etcher*. (Print Collector's Quarterly, February 1938.)
23. CHAMBERLAIN, SAMUEL. *Gloucester and Cape Ann*. (Hastings House, New York, Summer 1938.)
24. CHAMBERLAIN, SAMUEL. *Historic Salem*. (Hastings House, New York, Summer 1938.)
25. CHAMBERLAIN, SAMUEL. *Longfellow's Wayside Inn*. (Hastings House, New York, Summer 1938.)
26. CHAMBERLAIN, SAMUEL. *Historic Boston*. (Hastings House, New York, Summer 1938.)
27. MABIE, CHARLES R. Travel Articles in Various Newspapers.
28. MCKEEVER, J. ROSS and MACKESEY, THOMAS W. *Some Aspects of the Non-Conforming Use*. (Planners' J. 4, p. 47, March-April 1938.)
29. PARKER, WILLIAM S. *Construction and National Income*. (Eng. News-Record 119, p. 975, December 16, 1937.)

DEPARTMENT OF BIOLOGY AND PUBLIC HEALTH

30. BLAKE, CHARLES H. *Wolffiella Floridana in Massachusetts*. (Rhodora 40, p. 76, February 1938.)
31. BUNKER, JOHN W. M. and HARRIS, ROBERT S. *A Reappraisal of Vitamin D Milks*. (N. E. Jour. Med. 219, pp. 9-12, 1938.)
32. CLAPP, WILLIAM F. *Future Research in Connection with Marine Borer Problems*. (A. W. P. A. Proc., 1937.)
33. CLAPP, WILLIAM F. *Recent Increases in Marine Borer Activity*. (Civil Eng., December 1937.)
34. CLAPP, WILLIAM F. *Underwater Armies Bent on Sinking of Coastal Wharves*. (Boston Business, December 1937.)
35. CLAPP, WILLIAM F. *Preliminary Report on the Investigation of Marine Borer Problems in Connecticut*. (Published privately, 1938.)
36. CLAPP, WILLIAM F. *Standard Test Board Specifications. Revised Specifications for Special Test Boards*. (Published privately, 1938.)
37. CLAPP, WILLIAM F. *Warning to Owners of Marine Craft*. (Published privately, 1938.)
38. DUNN, CECIL G. *Antiseptic and Germicidal Properties of a Mixture of High Molecular Alkyl-Dimethyl-Benzyl-Ammonium Chlorides*. (Am. J. Hygiene 26, p. 46, July 1937.)
39. DUNN, CECIL G. *Fungicidal Properties of Sec-Amyltricresol, Orthylhydroxyphenylmercuric Chloride and a Mixture of the Two*. (J. Inf. Dis. 61, pp. 31-36, July-August 1937.)
40. DUNN, CECIL G. *Fungicidal Properties of Alkyl-Dimethyl-Benzyl-Ammonium Chlorides*. (Proc. Soc. Exp. Biol. Med. 37, pp. 661-663, 1938.)
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