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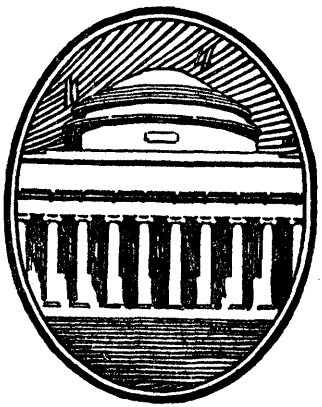

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REPORT OF THE PRESIDENT

TO THE MEMBERS OF THE CORPORATION:

We meet at a critical time such as has occurred previously about once in each generation, but which we hoped in 1919 would never occur again. War and rumors of war again disturb our equilibrium and may threaten our peace on this continent. Through no desire of our own, or indeed of any of the great peoples of the world, but through the past mistakes of all peoples and the selfish ideologies of a few of today's national leaders, we face another old-world conflict which challenges our ideals of free and peaceful pursuit of the arts of living. Undoubtedly the foremost problem before our educational institutions is to determine and follow such policies as will contribute most effectively to the maintenance of those ideals which are basic to our American life.

Above all else our forefathers struggled to secure freedom and opportunity and to safeguard these as inalienable individual human rights for their posterity — for us and our children's children. To do this they established our democratic form of government and adopted our Constitution. To make democratic government workable they established a great system of education. We of the Massachusetts Institute of Technology are a part of this system. While our immediate objectives are to discover and to teach the truth, especially in the realm of the physical world and man's adjustment to it, our ultimate objectives are those of our nation: to promote freedom and opportunity among men. For truth, in the form of exact knowledge, brings freedom and opportunity to those who gain it.

It therefore seems to me that our first duty, in this time of turmoil and danger, is to carry on our normal educational program as effectively as possible and with a minimum of confusion. Whatever course future events may take, the world will need young men versed in science and skilled in the arts of its application to promote human welfare.

A second duty also seems clear to me. Our staff and our laboratories are being increasingly found useful in making direct contributions to our country's welfare, as I shall illus-

trate later by a few current examples. Some of these activities are directed toward improved health or safety, others toward new or improved products and processes for industry, others toward assistance of both business and government in problems of personnel or of planning, and still others toward national defense. Great need in all these directions exists; we and others are only beginning, through experience, to realize how unusually effective our institution can be in meeting many aspects of such needs. We should seek definitely to expand and improve our operations in performing this type of direct public service.

In the third place, we should be alert to the needs and opportunities for service to our country in direct proportion to the degree of national emergency which may exist. For example, certain technical problems of national defense might properly now engage the attention of our staff which, under less portentous circumstances, should be given a lower priority or left to other auspices. If ever the extreme situation of a struggle for existence of our country or its ideals should befall us, then I am sure that we should do as we did in 1917 — temporarily subordinate our normal educational and research program, and place all our facilities at the disposal of the nation with suitable arrangements for their wise use.

I believe the probability is very small that we shall have to face such an extreme situation, though present world events have already forced us to make some changes in our program and we have made other changes voluntarily. The best policy appears to me to be for the administrative officers of the institution to attempt to envisage and be somewhat prepared for any eventuality which might disturb our normal program, but otherwise for our entire staff and student body to depart from it as little as possible. I hope that the slogan "Business as usual," or even "Business better every month," may long be applicable on the educational front.

While on this general subject I cannot refrain from a comment on the attitude of educators and scientists on certain aspects of the world situation. Whatever they may believe about the merits of the Versailles Treaty, or proposed readjustments, or the Munich Agreement, or cash and carry versus embargo, I believe they are practically unanimous in condemn-

ing Germany's recent indiscriminate persecution of minorities without regard to individual merit, and they are opposed to authoritarian control. On these fundamental issues we are definitely not neutral, and this is not for sentimental reasons but has a deep-seated basis.

Authoritarian control is inherently contradictory to the spirit of science and the pursuit of knowledge. In the world of scholarship, there is no authority except the truth, as it can be demonstrated by observation, experiment and experience. In the world of engineering, physical laws and economic analyses are the authority for all decisions. Every injection of authority based on the prejudices or ambitions or objectives of people is a blow to scientific progress.

Educational institutions also have been particularly sensitive to the loss which science and culture have sustained through the reckless destruction in Germany of some of the world's finest sources of scientific and cultural progress. We have felt and to some extent shouldered the burden of salvaging these sources.

For these reasons, while I have advocated a program of as nearly as possible normal educational and research activities, I would not imply that we are disinterested in some of the basic aspects of the European struggle.

OPERATIONS OF THE PAST YEAR

Turning now to our internal affairs, it is my duty to discuss such aspects of our year's operations as are significant in showing accomplishments and trends. More detailed discussion of every phase of our work is given in the appended reports of the other administrative officers. I shall first summarize the situation in several fields which are of perennial interest.

Finances. The Institute completed another fiscal year on the proper side of the ledger. On a budget exceeding $3,000,000 there was an *operating* deficit of approximately $25,000 which was one-half of the deficit deliberately budgeted in the spring of 1938. This operating deficit was erased, however, by credits accruing from the previous year's operation and by a draft upon the Income Equalization Reserve Fund set aside out of extra dividend payments two years ago. By

cushioning the fall in investment income during the most recent recession, this Reserve Fund has admirably served its purpose. With its books thus balanced, the Institute wound up over seventy years of operation with an all-time balance of $516.85 — a figure which is the more significant because it is modest.

Of the Institute's total expenditure of $3,208,400, 69 per cent was Academic Expense (*i.e.*, teaching and research), 22 per cent Administration and Plant Expense, and 9 per cent Miscellaneous Expense. As Trevor Arnett of the General Education Board lately pointed out, it is an axiom among educational administrators that expenditures for strictly educational purposes should equal at least 50 per cent of total expenditures. With our own expenditures for strictly educational purposes approaching 70 per cent, I think we can properly claim to be operating efficiently in the interest of our major educational objective.

Fifty-eight per cent of our operating income for the year was derived from students, 35 per cent from investments, and 7 per cent from other sources, compared with 50, 43 and 7 per cent respectively, for the preceding year.

The market value of the Institute's investments as of June 30 approximately equaled book value. The yield on all investments, based on market value as of June 30, was 3.89 per cent, compared with 4.45 per cent a year ago. Investment income distributed to the pooled funds on the basis of book value was at the rate of 4.02 per cent, compared with 4.55 per cent last year and 5 per cent two years ago. The general investment list showed a decline of approximately 8 per cent in bonds and a corresponding increase in common stocks and mortgages. Government bond holdings were maintained and real estate holdings showed an increase. In detail the June 30 portfolio showed 40.3 per cent in bonds, 5.4 per cent in preferred stocks, 47.6 per cent in common stocks and 6.7 per cent in mortgages and real estate. Comparable percentages for the preceding year were 48.7, 5.6, 42 and 3.7 respectively.

The table on page 13 shows the status and trend of operating income and gifts.

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
1938–39	3,203,300	1,362,392

Although the total is encouraging, an analysis of trends in gifts to M. I. T. in comparison with trends in gifts to other educational institutions is not so encouraging. Data recently published on forty-nine institutions show that, during the eight years of the depression period following 1929–1930, nine educational institutions surpassed M. I. T. in the total of gifts and bequests received. If we consider gifts alone, as distinguished from bequests, it appears that twenty-five institutions exceeded our record for gifts.

Our endowment funds are exceeded by those of six universities in this country. The above figures show, therefore, that we have slightly lost ground in our relative financial position (although I believe that this is largely, and perhaps more than, offset by our Finance Committee's excellent record of investments). But most striking in this analysis is the fact that more than half of all these forty-nine institutions received more in gifts than we received during these eight years. For this fact I can see certain reasons.

The principal reason for the relative smallness of our record of gifts is probably the fact that we purposely made no major effort or campaign for funds during this period. We knew that our alumni and friends were having their own financial worries, and our situation was not more desperate than theirs. Consequently we devoted our major attention during these years to a strenuous effort to improve the efficiency of our own operations,— by eliminating activities of relatively less significance, by shouldering a heavier teaching load in our staff and by

reorganizing our curriculum on a basis which is both more effective and more economical.

Actually, we sought minor funds for several specific new projects, and then undertook the recent Alumni Fund Campaign for recreational facilities desired to give better balance to our student life. This campaign had a broad, but not a deep, appeal; by and large our alumni were interested in helping to secure these facilities for future generations of students, but the objective was not of a type to stimulate large gifts,— it was not fundamental enough to induce men really to build their lives into it by major donations. Had we been in desperate financial straits, and thereby forced into a money-raising campaign to salvage the institution, I have faith that our constituency would have responded generously through their own sacrifices.

Among the larger gifts of the past year were the Marcella B. Upham bequest of $302,794 for scholarships; the Stephen L. Bartlett bequest of $306,747 for endowment; the grant of $385,483 from the A. F. Bemis Charity Trust for the A. Farwell Bemis Foundation for housing research; and $89,319 received on account of the Alumni Fund. Of the total donations $1,131,510 were capital gifts and $230,881 miscellaneous gifts.

Enrollment. The trend of student registration since 1930 is shown in the table on page 15. Under our plan for the stabilization of enrollment, now in its fourth year, the quota aimed at for freshmen is 600, and 605 were registered this year.

The freshmen admitted were selected from among 1,621 qualified applicants, a gain in applicants over last year of approximately 100. Although this year's entering class is the most carefully selected group yet admitted, and the present selective plan over the past several years has brought about a marked improvement in the all-round quality of our student body, our Admissions Office is seeking further to increase the number of good applicants and thus the degree of selectivity. The Honorary Secretaries and other alumni are participating effectively in this effort to increase the number of thoroughly qualified applicants along with their indispensable work of interviewing those who have applied.

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
1939–40	2,379	605	721	3,100

The extent to which the Institute has become a national and international institution is indicated by the geographical distribution of our students last year. Seventy per cent came from outside Massachusetts, 60 per cent from outside New England, 33 per cent from outside the North Atlantic States, and 7 per cent from outside the United States. The number of foreign students registered, 231, represented 43 foreign countries, the largest number being from Canada, China, the Philippine Islands and England, in that order.

Despite the European War, the number of graduate students is again the largest in the history of the Institute and in this group we find additional evidence of wide distribution. Of the graduate students registered last year, less than 25 per cent received their Bachelor's degree from the Institute, and altogether 220 colleges were represented.

Student Aid. There are two major ways by which the Institute aids scholastically qualified students of limited means to finance their education here: one is by scholarship and fellowship awards, and the other is by loans. Taken together, these two forms of aid provided students with a total of $367,724, or one-fifth of the total tuition fees paid to the Institute. The extent of student aid available and its increase, as detailed in the table on page 16, is evidence that students are not, and need not be, deterred from attending the Institute by limited financial resources.

Summary of Student Aid at M. I. T.

	1937–38		1938–39	
	Number	Amount	Number	Amount
Undergraduate Scholarships	499	$ 79,635	539	$ 92,034
Graduate Scholarships and Fellowships	300	109,162	300	108,517
Loans	318	119,557	368	167,173
Student Employment Service	594	74,692	560	62,970
Total Student Aid		$383,046		$430,694

The success of the Loan Fund as a means of student aid continues to be demonstrated. During the nine years of its operation 1,974 students have borrowed $1,320,000, the average amount per capita being $670. It is evidence of the good faith and successful placement in jobs of this group that 87 per cent of the amount due, or nearly a half million dollars, has been repaid. Moreover, the amount received for interest exceeds by nearly a third the total unpaid matured principal and exceeds by a factor of four the total of loans now deemed to be uncollectable.

Physical Plant. While no major addition to our educational buildings has been made since the occupation of the magnificent William Barton Rogers Building a year ago, we have completed or begun three small structures important to our research program, opened a notable new museum in the Rogers Building, provided new quarters for our women students, dedicated a new field house and athletic field, and begun construction on the first unit of our projected athletic center.

Of the research units, the building housing the cyclotron has been completed, and the cyclotron itself is virtually ready for operation, having been built in record time from funds provided by the John and Mary R. Markle Foundation. This instrument will be used for the artificial production of radioactive chemicals to be utilized in medical and biological research in coöperation with neighboring institutions.

The second research unit, upon which construction was begun last month, will house another instrument important in our high-voltage program and like the cyclotron of great value

to medicine. This is a three million-volt x-ray and cathode ray generator destined ultimately for use in cancer therapy after the Institute has completed a study of its characteristics and made some physical and biological tests of its utility. Made possible by a grant from the Godfrey M. Hyams Trust, this generator will be the third of a series of constantly improved high-voltage x-ray generators of the Van de Graaff type built at the Institute for medical use — the other two now being in successful operation.

The third new building for research is the small Solar Energy Laboratory which is to be used in the program now under way at the Institute, financed from the Godfrey L. Cabot Solar Energy Fund. Resembling a small cottage but efficiently functional in its design, this interesting building provides properly oriented roof space for testing various solar energy collectors and contains facilities for studying different possible uses of solar heat, including winter house heating, summer air conditioning, and power generation.

Those who have visited the Dard Hunter Paper Museum, formally opened with a tea and reception on Alumni Day last June, will agree I am sure, that it is worth a pilgrimage and that it is one of the most charming spots near Boston. Dr. Hunter is known throughout the world as an authority on the history of paper and paper-making, and the collection which he has assembled and which he sumptuously displays in this museum is the most complete in existence. As the editors of the Bulletin of the Friends of the Library wrote recently, "Mr. Hunter has created at the Institute not only a fine historical collection for students and lovers of the graphic arts, but another one of those amenities . . . which tend to create the rounded social atmosphere which the scientist or engineer of tomorrow must breathe if he is to be a truly social man."

During the year still another amenity was provided within our present buildings, this time specifically for our women students who number half a hundred. For years these students have had no adequate headquarters; the small Margaret Cheney room provided only partially for their needs. Consequently when we expanded into the new Rogers Building, space was set aside on the third floor of Building 3 for a new Margaret Cheney room, and this past spring funds became available to

adapt the space. The new quarters, designed by Miss Florence W. Stiles, newly appointed Adviser to Women Students, include a lounge, study room, kitchen, and locker room, all attractively and comfortably furnished. The general requirements were set forth in an earlier study by a representative committee of alumnae, women students and faculty wives.

Among the many other improvements in our present facilities, the air conditioning of the Eastman Lecture Room has met with particular appreciation. This lecture room is intensively used during the summer for the special conferences and programs which are playing an increasingly important part in our summer work.

In the Alumni Fund Campaign, completed a year ago, $429,000 was contributed or pledged for improving and extending the recreational facilities available to our students. While this amount fell considerably below the goal set by the Alumni Association, it is making possible additions to our athletic plant which will go far toward achieving the recreational objectives which we have set forth. With these funds we completed this last year a modern field house and an excellent new athletic field, and we started construction of the first unit of the projected athletic center, a unit to house a swimming pool. The new field house, which has been named for Frank Harrison Briggs, '81, father of Technology's present athletic system, contains locker room for 450 men, shower baths, a rubbing room, two offices for coaches, a dressing room for officials, and three rooms for visiting teams. The building is so constructed that it will be possible eventually to construct beside it a cage, which is one of the desirable athletic units left to the future. In its present form the building will service at least five sports. The new track, perhaps the finest in New England, is immediately to the west of this field house.

Construction began in August on the swimming pool, the first unit of the larger building projected to house eventually all the indoor sports at the Institute. This building, designed by Professors Anderson and Beckwith of our School of Architecture, as was the Briggs Field House, is located on the northeast portion of the Institute property on the site of the former outdoor track and playing field. The structure contains a standard intercollegiate swimming pool, 42 feet wide by 75 feet

long, and a shallower practice pool 20 by 40 feet. Seats for 340 spectators will be provided, together with shower and locker rooms for students (including special facilities for the use of women) and offices for the coaching staff.

Many ingenious technical features have been incorporated in the design of this building. Virtually the entire south side is of glass and the orientation and size of the fenestration are designed to provide a maximum of winter sun falling upon the pool and a minimum of summer sun. Differences in temperature conditions in the spectator and swimming areas have been planned and extensive use will be made of panel or radiant heating. The filtration system for the pool has been especially designed by Professor Camp of the Department of Civil and Sanitary Engineering and will approximate the best systems in use for the filtering of drinking water. This will add not only to the safety of the pool and to the economy of its operation, but will make possible a decrease in the use of chlorine and alum, which sometimes prove irritating to swimmers.

Through these various improvements, embellishments, and additions, we have continued during the year to create an environment more conducive to effective work by students and staff alike. We have implemented some notably important research activities and we have made progress in providing facilities "to build the man as well as the mind," to use the slogan of the Alumni Fund Campaign.

Summer Session. An increase of 11.6 per cent in registration and the addition of two special programs to our already imposing list of scientific and industrial conferences and courses marked our last summer session. The total registration in credit courses approached 1,600 and this figure does not include half as many again who attended conferences for which no Institute registration was required.

The two new programs introduced were a course in Graphics offered by the Section of Drawing and a course in the Application of Statistics to Quality Control given jointly by the Department of Mathematics and the Department of Economics and Social Science. The Graphics course was designed for teachers of drawing; the Statistics course drew its students from sixteen industries and two educational institutions.

Alumni Placement. The growing demand on the part of industry for men to fill positions of exceptional responsibility and the increased degree to which employers are turning to our Placement Bureau in their search for outstanding men of maturity have required us during the year to give special attention to alumni placement. Many times we have found ourselves in the embarrassing position of being unable to find qualified candidates for exceptional openings; obviously it is unfortunate for the reputation of the Institute not to be able to suggest candidates when calls come to us.

The difficulty arises out of the fact that men of high calibre and successful records infrequently indicate their availability for better positions and are, therefore, not registered with the Bureau or with their departments. The Placement Bureau, if it is to perform its maximum service to alumni and not restrict its activities to finding jobs for those who seek them, must have available the names of men eligible for increased responsibility.

We have been attacking this problem in several ways. Departments have been asked to prepare lists of successful alumni, a better working arrangement between the Bureau and department placement officers has been put into operation, and our Placement Officer, Mr. Sage, is steadily widening his contacts with alumni. To supplement these measures we have sent to every alumnus for whom we have an address (some 28,000) a personnel record to be filled out. When these records are returned, they will be referred to departments for comment and appraisal, and the information will be classified and coded for punch cards to facilitate rapid survey and initial selection. Through these means and others we hope to broaden our placement service and to better its service to both industry and our alumni.

In outlining this problem I do not mean to infer that our Placement Bureau is not already performing a valuable and impressive service. Last year more than 1,400 interviews with alumni and employers were held in the Placement Office, and there was a marked increase in the number of companies sending representatives to interview the graduating class. Working through the Placement Office, 180 companies employed over 300 members of the graduating class. At the last count early

in September, the overall placement of the Class of 1939 stood better than 80 per cent.

The increase in the number of employers coming to the Institute for both alumni and undergraduates is highly gratifying. Here is evidence of strength which cannot be discounted; it reflects the prestige of the Institute, it affirms the success of our selective admission, and it testifies to the effectiveness of the program and policy of the Placement Bureau.

Annual Alumni Fund. Important to the future of the Institute was the action by the Alumni Council last January in voting unanimously to recommend the establishment in 1940 of an annual alumni fund. The plan, for which enabling legislation is now being prepared for submission to the alumni body, provides for the solicitation of an annual contribution from alumni to include the present alumni dues and an additional amount to be donated to the Institute for capital uses.

This plan already is in successful operation in many colleges and has met with approbation among college alumni. Its advantages are that it enables benefactions to be made on a systematic basis; that alumni prefer to be solicited regularly for a modest sum rather than to be approached irregularly in a concentrated campaign for large sums; and that experience demonstrates that a mechanism providing for regular contributions promotes a more vital interest in the institution benefited. Furthermore, a study of alumni funds at other institutions indicates that over a period of years the total amount contributed under the annual plan should be greater than amounts contributed through special and sporadic campaigns.

I am convinced that our own plan will eventually result in substantial annual additions to the Institute's capital resources and will promote a more vital interest on the part of our alumni in the Institute. It is certainly an important step in the coördination and rationalization of our fund raising activities. Again the Alumni Association demonstrates that the scope of its objectives includes the permanent welfare of the Institute.

Personnel. New members elected to the Corporation during the year included two Life Members, Vannevar Bush and William Emerson; three Alumni Term Members, Charles Edison, Philip W. Moore and Harold B. Richmond; and one

Special Term Member, Charles R. Hook. The three Alumni Term Members whose five-year terms expired were James M. Barker, Willis F. Harrington and William R. Hedge, and the Special Term Member whose two-year term expired in January was Frank D. Comerford.

On August 28 Henry Smith Pritchett, President of the Institute from 1900 to 1907, died at his home in California at the age of eighty-two. For twenty-five years after leaving the Institute Dr. Pritchett was President of the Carnegie Foundation for the Advancement of Teaching, where he was a stimulating and influential figure in American education.

By retirement during the year we lost from the active staff of the Institute William Emerson, Dean of Architecture since 1919; W. Spencer Hutchinson, Head of the Department of Mining Engineering since 1922; and Alpheus G. Woodman, Associate Professor in Chemistry and a member of the staff since 1897. Each of these was given the title of Emeritus Professor. The loss of Professor Emerson as Dean of the School of Architecture is partly compensated for by his continuing association with the Institute through his membership on the Corporation. During his twenty years at the Institute Dean Emerson has been universally recognized as a great teacher and administrator, and he has had a profound influence not only on our own School of Architecture but on architectural education throughout the country.

Walter R. MacCornack of Cleveland, Ohio, practicing architect and Vice-President of the American Institute of Architects, has been appointed to succeed Professor Emerson as Dean of Architecture, as Professor of Architecture and as Head of the Department. Mr. MacCornack, a graduate of the Institute in the Class of 1903, has been identified with the design of many notable buildings. He is an outstanding specialist on school and college buildings, as well as an expert on large-scale housing, and he is giving much attention to finding useful new opportunities for young architects.

Robert G. Caldwell, until recently United States Minister to Bolivia, and former Minister to Portugal, arrived in August to take up his duties as Dean of Humanities. Dr. Caldwell brings to the Institute an extraordinarily wide background. He has taught history and English literature in India, studied

history at Auburn Theological Seminary and taught history and economics at Huron College in South Dakota. In 1909 he returned to his Alma Mater, the College of Wooster, for a year as professor of philosophy and psychology. Then followed advanced studies as a fellow in history, politics and economics at Princeton University, which granted him the degree of Doctor of Philosophy in 1912. Between 1910 and 1914 he was instructor and then professor of politics and economics at the College of Wooster, and in 1914 he started a nineteen year career as professor of history at Rice Institute in Texas and in 1918 he was appointed Dean of that institution. His educational experience, combined with his subsequent diplomatic service, fits him admirably for advancing the Institute's program of training well-rounded scientists, engineers and architects capable of contributing to the solution of economic problems in our changing social order.

Other new appointments to the Institute include Antoine M. Gaudin, Richards Professor of Mineral Dressing; Sverre Petterssen, Associate Professor of Meteorology; Carl F. Floe, Assistant Professor of Physical Metallurgy; Dard Hunter, Curator of the Paper Museum; James R. Killian, Jr., Executive Assistant to the President; and Miss Florence W. Stiles as Adviser to Women Students.

Promotions were as follows: Thomas P. Pitré to Associate Dean of Students; Professor Charles E. Locke to Acting Head of the Department of Mining Engineering; Charles S. Draper, Wyman P. Fiske, Victor O. Homerberg, Joseph H. Keenan, Otto C. Koppen, Philip M. Morse, Joseph S. Newell, Manuel S. Vallarta and Bertram E. Warren to the grade of Professor; Lawrence B. Anderson, Herbert L. Beckwith, John L. Reid and Francis W. Sears to the grade of Associate Professor; and George A. Akin, Gordon S. Brown, Francis M. Currier, Cecil G. Dunn, Harold A. Freeman, Henry G. Houghton Jr., Albert R. Kaufmann, Norman Levinson, M. Stanley Livingston, Dwight L. Palmer, Carl M. F. Peterson, James E. Seebold, Flavel Shurtleff, Irwin W. Sizer, Howard R. Staley and Roy P. Whitney to the grade of Assistant Professor.

Leaves of Absence were granted to Carl G. A. Rossby, Professor of Meteorology, for three years, during which time he will serve as Assistant Chief of the Weather Bureau in

Washington; and to Charles M. Spofford, Hayward Professor of Civil Engineering, for the first term of 1939–40.

Resignations were accepted from Associate Professors Fairfield E. Raymond, Glennon Gilboy, Horace T. Mann, George C. Manning, and Assistant Professor Igor N. Zavarine.

On September 8 we lost by death, Professor Charles Ladd Norton, Director of the Division of Industrial Coöperation and for forty-six years a member of the Institute staff. Before becoming Director of the Division, Professor Norton was Head of the Department of Physics, and in 1922 he served as a member of the Administrative Committee during the period when the Institute had no President.

The following Emeriti Professors have died during the year: Henry Fay, April 24, 1939; and Arthur E. Kennelly, June 18, 1939.

NOTEWORTHY DEVELOPMENTS OF THE YEAR

Of the many features of our program which have come to light during the year, I can mention only a few, concentrating on those which present a call for action, or emphasize the capacity and potentialities of our staff, or provide guideposts pointing out new directions for our future activities.

Public Service. Perhaps the most striking feature of the Institute's record during the year has been the increase in services to governmental agencies and other public bodies. Virtually every department has been performing this type of public service either by providing specialized training for government personnel, or by undertaking special research. Let me give selected illustrations of some of these activities to show their wide variety.

This spring, at the request of the United States Navy and with the active assistance of the Corporation's Visiting Committee of the Department of Naval Architecture and Marine Engineering, we organized a special one-year graduate course in Naval Engineering to begin this fall. The Bureau of Engineering of the Navy Department has detailed ten junior officers to take the course, and our fellow member on the Corporation, Mr. J. W. Powell, has secured funds for three scholarships for civilian students. In addition the Society of Naval Architects and Marine Engineers, the United States Maritime Commis-

sion, and the Newport News Shipbuilding Company are sending students. The program will probably be expanded in the near future, in step with some current reorganization plans in the Navy Department, and it represents an effort to meet the acute shortage of marine engineers. Also, at the request of the Navy, we have enlarged our facilities to care for an increase to twenty-eight in the number of naval officers in the course in Naval Construction. Special work for officers of the Services has been developed also in other departments, notably in Aeronautical Engineering and in Electrical Engineering, with the result that this new academic year finds ninety-seven Army and Navy officers pursuing post-graduate work at the Institute.

Coöperation of another type is illustrated by the Civilian Pilot Training Program of the Civil Aeronautics Authority. Having last year assisted the Authority in the experimental development of this flight training program, we this year will select fifty students from among applicants to take the flight instruction provided by the Government and we will provide the ground school instruction.

Our governmental research activity has similarly expanded. The Division of Meteorology has several programs under way in coöperation with the United States Weather Bureau, and we have lent Professor Rossby of this Division to serve as Assistant Director of that Bureau, in charge of research and education. In another direction fundamental problems are under investigation for the National Advisory Committee for Aeronautics in the Automotive Laboratory, and Professor deForest has undertaken several important researches for the Navy relating to the strength of materials. Our Department of Electrical Engineering, with collaboration from the Civil Aeronautics Authority and other agencies, has made important contributions to the art of landing airplanes by instruments (blind landing). A further effort to contribute to the safety of flying is represented by the establishment here of a fundamental program of research on factors involved in the de-icing of airplane surfaces — again with coöperation of several governmental and private agencies. And working in an entirely different field, we find our Civil Engineering Department designing, in consultation with the United States Coast and Geodetic Survey, apparatus for the analysis of earthquake motions.

I have not begun to exhaust the list, nor have I included any of the very numerous consulting and advisory activities of individual members of our staff serving local, State and Federal agencies. The picture is sketched in enough, however, to show that public service of this sort has come to be a notably important part of our program and that the extent to which we are thus called upon shows recognition of the teaching effectiveness and creative capacity of our staff. (Incidentally it adds materially to the burden on our staff and facilities, even though direct costs of these services are usually provided for by the coöperating agencies.)

Co-operative Research. Last spring a census showed five hundred and twenty-nine research projects under way in our laboratories. Many of these are related and coalesce into unified wide-ranging programs breaking across departmental boundaries and involving coöperation with outside agencies. As examples of this collaborative attack on problems I can cite our solar energy project, the investigation of anaesthesia explosion hazards, and the magnetic laboratory. The corrosion program is yet another. But there are two which I would like to mention in detail because they are particularly exciting at the present time and involve the extensive participation of outside groups.

The first of these is our rapidly developing ultra-high frequency program. Communication engineers have long had ideas as to how directed radio transmission could be applied to many practical problems, including point-to-point communication, secret and open, precise direction and distance finding, and obstacle location, both in air and marine navigation. These interesting applications have been delayed because equipment suitable to produce and receive ultra-high frequency radio waves had not been developed.

Several years ago a group of our electrical engineers became interested in the high frequency field, particularly in relation to its use as an aid to navigation during fog. Out of this evolved some important discoveries relating to the transmission of short radio waves in hollow pipes and to the development of horns able to send beams of these waves out through space in any desired configuration and direction. At about the same time we were able, with the collaboration of the General Radio Com-

pany, to devise ways and means of accurate measurement of high frequency waves and their effects.

As a result of these activities we were prepared to carry to a successful conclusion the development of a new method for the blind landing of airplanes whose field tests have surpassed in performance any previous method. This investigation has been sponsored by the Civil Aeronautics Authority. The first practical application of a powerful new ultra-high frequency generator, invented at Stanford University, was made in this research through the courtesy of that University, the Sperry Gyroscope Company, and the United States Army.

At this point, realizing the great potentialities in this new field, the advantages of establishing a special high frequency laboratory became clear, and with the encouragement of the Corporation's Visiting Committee of the Department of Electrical Engineering some funds were obtained for its initial support. Today we are equipping this laboratory to service the Department of Electrical Engineering and other departments of the Institute, and already it has become a focal point for a variety of collaborative researches. Our group is finding mutually helpful coöperation with Mr. Alfred Loomis and his staff of the Loomis Laboratory at Tuxedo Park in an investigation of the propagation of ultra-high frequency waves, and two other related projects have been undertaken, one sponsored by the International Telephone and Telegraph Company and the other by the Sperry Gyroscope Company.

The entire project is a convincing demonstration of the benefit derivable from joint efforts and is typical of a pronounced trend in our investigational activities at the Institute.

The second illustration which I have singled out is the cyclotron program, which holds comparable promise in a different direction. The cyclotron itself is practically ready for action. It is equal in size to any cyclotron yet built, with the exception of one of the great machines at the University of California, and into its construction went the efforts of specialists in physics, electrical engineering, building construction and ventilating engineering, and much help from outside agencies.

In providing funds for the cyclotron, the John and Mary Markle Foundation specified that the cyclotron is "to be used exclusively for coöperative research and therapy" and this

Foundation has also provided funds to support for three years one project which is already actively under way, jointly with a group in the Harvard Medical School and the Massachusetts General Hospital. This relates to the functioning and diseases of the thyroid gland. Radioactive iodine, which can be produced in large quantities by the cyclotron, is injected into the human body and while traveling through the body, ultimately to the thyroid gland, it can be traced or detected and quantitatively measured at any desired time and in any organ or tissue of the body.

This same "marked atom" technique has a multitude of possible uses; physicians are turning up dozens of fundamental medical problems that can be studied by this means. We have now the proper facilities and contacts to carry through such studies on a large scale and we have a staff that is demonstrating extraordinary competence in the coöperative study of medical problems. Not only is it desirable to operate the instrument to its full capacity, but there are urgent and exciting medical problems crowding in to demand its use. Out of the lack of funds to care for this situation arises one of the critical needs in our research program. With the opportunity so great to aid in making fundamental contributions to medical science, I hope that we may find adequate financial means to prosecute this program to the fullest degree.

Other Research and Educational Developments. During the last academic year the administration called in a group of experts from the field of mineral dressing to advise the Institute on whether it should continue work in this field in the light of the forthcoming discontinuance, upon recommendation of the Visiting Committee, of our course in Mining Engineering. This group recommended not only that we continue our mineral dressing program but that we expand it. As a result of this recommendation there has been appointed to our staff one of the outstanding authorities on mineral dressing in the world, Professor A. M. Gaudin of the Montana School of Mines. He is now at the Institute and is devoting special attention to the flotation process which has become so important in the mining industry and which has wide application in other industries.

The new differential analyser, designed under the direction

of Dr. Vannevar Bush, is nearing completion, and will provide the Institute with the most advanced mechanical facility in the world for analysis and computation. This instrument will be the most important feature in the Center of Analysis now being developed, though several other new calculating machines for special purposes are also noteworthy. Following a grant of about $100,000 from the Rockefeller Foundation to build this machine, we have received a grant of $45,000 from the Carnegie Corporation to establish the Center of Analysis and to support it for a two-year period. Its facilities and operating personnel will be available to scientific workers without regard to institutional connections.

This summer a milestone was reached in our spectroscopic research with the publication by the Technology Press of the M. I. T. Wavelength Tables, a compilation of over a hundred thousand of the most important spectral lines of the chemical elements. These tables, prepared with the assistance of the Works Progress Administration, will provide scientists with more comprehensive and accurate data on spectral wavelengths than have previously been available.

DESIDERATA

Each year the preparation of this report leads to a survey and reëvaluation of our situation, and especially to the designation of those needs or desiderata which we consider to be our proper next objectives. It is gratifying, on looking back, to realize that one by one, and in one way or another, many of these former objectives are now realities; others however are still needs and hopes.

Having in mind the fact that our educational program has emerged from a recent and very thorough overhauling, and that the past two years have brought great improvements in our facilities for recreation and social amenities in the life of our students, I believe that the major emphasis now needs to be laid on strengthening our abilities to perform important scientific and technical services, of high calibre or unusual character, to governmental and industrial agencies. This is one of our basic charter directives, it has valuable repercussions on our educational program, it includes or presupposes activity in pure scientific research, and the opportunities and our

capacity to cope with them have become increasingly evident.

Granted the value of this aspect of our program, and knowledge of the directions in which it should be maintained and developed, the practical program is to identify the "bottlenecks" which limit us to less than the best performance. Here several of our Visiting Committees have performed invaluable service, and in the following brief statements of our immediate needs, I shall draw largely from their carefully considered recommendations.

Staff Personnel. Our apparently generous ratio of number of instructors to size of student body becomes less impressive when we take into account the "extracurricular" activities of the staff in research, or in supervising the numerous public services of types referred to above. Furthermore, it is conservatively estimated that the staff serve on more than one thousand technical committees, advisory and executive bodies in national or governmental organizations — all as *pro bono publico* services. The actual fact is that the staff now carries too heavy a burden for the ultimate best interests of the institution and in certain spots there are again "bottlenecks" or precarious dependence of large interests on one or two overburdened individuals. Means should be found to rectify these situations beyond what has been possible within the budget and by internal readjustments.

Chemical Engineering Laboratories. There is every evidence that the recent great popularity of the Chemical Engineering course and the demand for its graduates will continue. It is the most inadequately housed and most crowded of the engineering departments. The Visiting Committee advocates an adequate and conveniently located new building for its use.

Addition to Automotive Engineering Laboratory. For many years admission to our preëminent Aeronautical Engineering Course has been severely restricted to a small fraction of the applicants for it in the freshman class, because the opportunities for subsequent employment in the industry were on a far lower scale than the popularity of the course. Now this situation has changed — we believe permanently. Consequently the Visiting Committee of the Aeronautical Engi-

neering Department has strongly urged a substantial increase in the quota of students admitted to this course.

Simultaneously there is a growing demand for automotive engineering in the non-aeronautical field, such as automobile and Diesel types. And now we have the new interest in marine engineering led by the coöperative training program for the United States naval engineers.

An absolute "bottleneck" which prevents any further development in these fields is lack of drafting-room space. Consequently we cannot grasp our opportunities to perform a better service in the automotive and aeronautical fields unless we can secure a modest, but still substantial, addition to our present otherwise excellent automotive engine laboratory. Carefully studied plans for this addition have been prepared during the summer.

Biological Engineering. This program, first outlined to the Corporation three years ago, has received wide commendation but very little financial support. Nevertheless, it has been in operation in a very modest way for two years, and our experience and the reaction from outside sources have increased our faith in the importance and forward-looking character of the program. We are in the situation of having grasped a great opportunity for whose exploitation we have not yet found the necessary resources.

Research Funds in General. I hold more strongly than ever that the thing which would most increase our effectiveness as an agency for promoting human welfare through technology is largely increased funds for scientific research and technological development. To be sure, we have made much progress, but two aspects of this progress disturb me: (1) the accomplishment is so small in comparison to the opportunities which we have at hand, well tested and lacking only ways and means for undertaking; (2) much of our present activity is dependent upon continually securing a great number of temporary grants or contracts, so that the situation is always precarious and long-term programs cannot be consistently organized.

They say that scratching for food keeps hens healthy and increases the output of eggs. To what extent scratching for funds keeps a research staff and its administrative officers

healthy and increases their useful output is questionable. Certainly it is better thus than not to scratch, eat and lay, but I am prepared to defend the thesis that a more adequate and assured sustenance of the academic analogue of the useful hen would be a very productive investment.

Dormitory. In quite another category, I mention the fact that our officers in charge of admissions and dormitories believe that we could advantageously operate another dormitory unit for perhaps one hundred men. If means can be found for undertaking this, I would urge that it be built and operated in such manner as to provide a marked addition to our existing facilities for social and intellectual extracurricular contacts between students and instructors and outside personalities of inspiring type. I know that students welcome and benefit from such relationships, and we have had a relative lack of opportunities to develop such an atmosphere in a really substantial way.

In spite of the recent record of large waiting lists for admission to our dormitories, it may be that we should hold in abeyance any attempt to meet this demand until the effect of the European War on our future operations can be better judged.

Survey of Fund Raising Potentialities. Having in mind the need of additional funds if such developments as those here outlined are to be undertaken, and desirous also of expert criticism of our public relations and our fund-raising efforts of the last few years, the Executive Committee has engaged the firm of Tamblyn and Brown to make a survey and report on these subjects.

In conclusion, I wish to express my great personal gratitude for the extraordinary interest, loyal helpfulness and support which my colleagues and I have always received from the members of this Corporation. Such an attitude is your duty as members of the Corporation, but I feel that there has been a warmth in your interest in the Institute which goes beyond the mere requirements of an official responsibility. Perhaps I should say that your attitude expresses the finest type of discharge of responsibility.

Respectfully submitted,

KARL T. COMPTON, *President.*

REPORTS OF ADMINISTRATIVE OFFICERS

Dean of Students. The trend of a higher proportion of students from a distance in the entering first-year class which continued for a third consecutive year; resources for student aid which increased appreciably by the generosity of the trustees of the James Melvin Trust and the Hayden Foundation, and encouraging repayments to the Technology Loan Fund which mounted to within one per cent of the half-million dollar mark; the action of the Institute Committee, which voted to restore the so-called Point System; the dedication of the new Frank Harrison Briggs Field House; and agreement upon plans for the first unit of the new gymnasium;— these are the principal accomplishments to be recorded for the period under review. They relate, respectively, to the four general sections of this report which, as in that for 1937–38, are: stabilization of enrollment, student aid, undergraduate government, and student welfare.

Applications for admission to the Class of 1942 exceeded in number those from candidates who sought to become members of the Class of 1941 despite the increase of tuition rate to $600, effective during 1938–39. The difficulties of estimating how many candidates should be granted admission during the spring and early summer months in order to yield 600 matriculants have been mentioned in the last two reports.

For 1938–39 the year opened with a registration of 656 first-year students, which figure included some "returning students," the actual number of those "entering" for the first time being 641. Withdrawals during the first term on account of health, finances, and for other causes reduced the 656 to 627 before the midyears, at which time 29 disqualified themselves on account of low grades. At the beginning of the second term 597 were registered as of the Class of 1942. These figures are cited to show that any crowding of sections or laboratories at the opening of the academic year was temporary and soon adjusted.

Percentage geographical distribution of first-year students for the past four years is shown by the comparative figures below, 1935–36 being the final year prior to the introduction of the selective admission plan:

	Percentage of First-Year Class			
	1938–39	1937–38	1936–37	1935–36
From outside New England.....	58.1	60.0	51.8	48.6
From outside Massachusetts....	67.1	66.0	59.2	57.0

Distribution of student aid to undergraduates during 1938–39 compared with 1937–38 was:

	1938–39		1937–38	
	Number	Amount	Number	Amount
Freshman Scholarships.....	235	$ 44,590	212	$ 42,807
Other Undergraduate Scholarships.....	304	47,444	287	36,832
Total Scholarships.....	539	$ 92,034	499	$ 79,639
Undergraduate Loans.....	282	132,756	254	97,363
Total Aid to Undergraduates	694*	$224,790	616*	$177,002
Percentage of Undergraduate Registration Receiving Aid	28.9		26.7	

* Allowing for individuals receiving both scholarship and loan.

The above tabulation does not include grants totalling $3,250 to 13 undergraduates "born in Massachusetts" made through the generosity of the trustees of the James Melvin Trust. It is gratifying to note that double this amount will be given from the Melvin Trust during 1939–40 when there will also become available the Charles Hayden Memorial Scholarships, for "Boston boys" who might otherwise be financially unable to enter Technology. These last-named awards have been provided by a gift of $50,000 from the Hayden Foundation and preference is to be accorded graduates of the English High School, at which the late Charles Hayden of the Class of 1890 prepared for the Institute. It is noteworthy that holders of these Charles Hayden Memorial Scholarships are expected to apply for assistance during their second and succeeding undergraduate years to the Technology Loan Fund of which Mr. Hayden was Treasurer from its establishment in 1930 until his death in 1937.

Including both graduate and undergraduate students, the Loan Fund Board received 498 applications during 1938–39

and acted favorably upon 368, or 73.9 per cent, $167,173 being loaned. For 1937–38 the corresponding figures were: 431, 318, 73.8 per cent, and $119,557.

Repayments to the fund during 1938–39 were: $101,635 on principal account and $15,228 for interest, or a total of $116,863, which came within $50,310 of providing the $167,173 loaned.

The cumulative record of the fund from its establishment in 1930 up to June 30, 1939 (with comparative figures up to June 30, 1938, given in parentheses), shows: that 1,974 (1,763) individuals had borrowed $1,322,568 ($1,155,395), the average amount loaned per capita being $670 ($656); and that $495,953 ($394,317) had been repaid on principal account, representing 87.3 per cent (84.4 per cent) of the amount due, and $93,038 ($77,809) had been paid on interest account.

Of the unpaid $72,762 due on principal account as of June 30, 1939, interest had been received and extension of principal repayment permitted on all but $38,309. It is also pertinent to observe that the $93,038 received for interest exceeded the total matured principal in arrears, $72,762.

William Barton Rogers Awards of $300 were made to six "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." During 1937–38, four seniors each received $500.

A total of 560 individuals were placed through the Student Employment Bureau of the Technology Christian Association: 235 under the National Youth Administration program of the Federal Government, 272 in private employment, and 53 under both classifications. Earnings were $62,970, of which $25,312 was under the N. Y. A. and $37,658 through private employment.

The average scholastic record of 614 men in 20 activity groups was 3.42 in June, 1939, compared with 3.44 for 592 men in 20 groups in June, 1938. Fraternity averages also showed little change, for 712 men averaged 3.23 in June, 1939, compared with 638 who averaged 3.24 a year ago.

During 1937–38 the Institute Committee saw fit to aban-

don the so-called Point System — a plan of thiry years' standing whereby rating points were assigned to offices in the student activity system in accordance with the supposed prestige of each position and the scope of its duties, with an imposed limitation upon the number of points which an individual might undertake to carry. The justification for continuing the plan was set forth in some detail in last year's report, concluding with the expectation that "an agitation to revive the Point System by some Institute Committee of the near future is within the realm of possibility." Happily, it is possible to record now that this year's Institute Committee voted unanimously to reëstablish the Point System with some amendment of its details but without alteration of any of its principles.

The opening of the new Graduate House, which increased housing capacity for advanced students by 150 (75 per cent), made dormitory space available for 200 (30 per cent) more undergraduates. Yet all facilities were operated at full occupancy during the greater portion of 1938–39. Members of the Class of 1939, however, did not completely fill the Senior House during its initial year and some of the space was allotted to third-year students.

The beneficial effects of having approximately a third of the student body adequately housed on the Institute premises, and of having a "waiting list" of applicants for the dormitories during the greater part of the academic year, do not require elaboration.

Similarly, the provision of such an admirable structure as the Frank Harrison Briggs Field House, and the impending start upon the new gymnasium by breaking ground for the unit which will include the swimming pool, are self-evident in their implications with respect to enrichment of student life during the coming years.

H. E. LOBDELL.

Dean of the Graduate School. The Graduate School completed the year with a registration of 692 students, of which 67 were college graduates taking special courses without reference to a degree. This was the largest graduate registration in the history of the Institute. The standards for admission have

been maintained at a high level. With quotas now set in seven departments, limiting the number of students who may be admitted, it has been found necessary to place on the waiting list desirable students whose applications were received after quotas had been filled. Thus, in Biology, Chemistry and Chemical Engineering at present no more students can be admitted because of lack of space and research facilities. Limitation of numbers has made the admission problem one of very careful selection. As yet it has not been found necessary to place quotas on the admission of graduate students to the Departments of Civil and Sanitary Engineering, Mechanical Engineering, Naval Architecture and Marine Engineering, Business and Engineering Administration, Geology, or Mathematics, or to the Department of Architecture. When this occurs, as it may in the not distant future, an upper limit will have been fixed for the size of the Graduate School; additional space, research facilities and staff will then be necessary for any department in which further expansion of graduate work is to take place. At present 22 per cent of all students in the Institute are registered in the Graduate School. It seems unlikely that this ratio will exceed 25 per cent in the near future. The following comparative statistics are of interest:

	Registration for the Past Five Years				
Candidates for Degree of	*1934*	*1935*	*1936*	*1937*	*1938*
Doctor of Philosophy	101	90	109	133	138
Doctor of Science	88	106	115	128	118
Doctor of Public Health	..	1	4	4	4
Master in Architecture	16	7	13	11	9
Master in City Planning	..	6	9	8	8
Master of Science	266	295	345	320	348
Special Graduate Students	29	31	24	42	67
Total	500	536	619	646	692

Registration by Departments 1938–39:

School of Architecture

Architecture	M.Arch.	9
City Planning	M.C.P.	8
Total		17

School of Science	*S.M.*	*Sc.D.*	*Ph.D.*	*Dr.P.H.*	*Total*
Biology and Public Health	6	..	9	4	19
Chemistry	3	2	79	..	84
Geology	6	2	10	..	18
Mathematics	3	..	10	..	13
Physics	8	16	30	..	54
Total	26	20	138	4	188

School of Engineering	*S.M.*	*ScD.*	*Total*
Aeronautical Engineering	13	8	21
Meteorology	11	3	14
Business and Engineering Administration	23	..	23
Chemical Engineering	38	40	78
Chemical Engineering Practice	51	..	51
Civil Engineering	40	4	44
Sanitary Engineering	2	1	3
Electrical Engineering	44	20	64
Electrical Engineering (Coöperative Course)	23	..	23
Mechanical Engineering	42	7	49
Mechanical Engineering (Coöperative Course)	7	..	7
Metallurgy	7	11	18
Ceramics	1	3	4
Mining Engineering	6	1	7
Naval Architecture and Marine Engineering	1	..	1
Naval Construction	9	..	9
Economics and Engineering	4	..	4
Total	322	98	420

Less than 25 per cent of our graduate students received their Bachelor's degree from the Institute. Three-quarters of the student body came from 220 different colleges and institutions located in 47 states, the District of Columbia, Porto Rico, and the following 25 foreign countries which were represented by 78 students: Argentina, Belgium, British West Indies, Canada, China, Colombia, Ecuador, England, France, Holland, India, Italy, Japan, Mexico, Panama, Philippine Islands, Scotland, Siam, Switzerland, Sweden, Syria, Turkey, Union of Socialistic Soviet Republics, Union of South Africa, and Wales.

The distribution of students from another point of view is also interesting. Twenty-nine per cent were pursuing courses in the School of Science, 68 per cent in the School of Engineer-

ing, 3 per cent in the School of Architecture. In contrast to the registration a few years ago we find that 42 per cent were working for the Doctor's degree and 58 per cent for the Master's degree. In the former group 60 per cent were in the Departments of Science and 40 per cent in the Departments of Engineering. On the other hand nearly 90 per cent of the students working for the Master's degree were in Engineering Departments. This is to be expected on account of the large registration in the five-year coöperative courses in Electrical and Mechanical Engineering, in the School of Chemical Engineering Practice, and in courses to which Army and Navy students detailed by the Government are assigned.

It is a pleasure to record that the exchange of graduate students between Harvard University and the Institute continues to increase. This past year during the first term, 20 Harvard students registered at the Institute and 11 Institute students registered for courses at Harvard. In the second term the figures were 19 Harvard students and 16 Institute students respectively. In addition 10 students from Harvard School of Public Health took courses with Professor Turner of the Department of Biology and Public Health. Upon the request of President Comstock of Radcliffe College the Coöperative Plan for the Exchange of Graduate Students between Harvard University and the Institute has been extended to include Radcliffe College and one Radcliffe student availed herself of the opportunity to attend advanced courses in Physics.

During the academic year, 289 higher degrees were conferred, namely, Doctor of Philosophy 39, Doctor of Public Health 1, Doctor of Science 26, Master of Science 217, Master in Architecture 5, Master in City Planning 1. This was the largest number ever awarded in any year.

The selection of outstanding candidates for fellowships and scholarships is the most difficult problem which the Committee on the Graduate School has to meet each year. Every department offering graduate work has more applications for financial assistance from excellent students for whom scholarships are strongly recommended than it is possible to grant, and an allocation of awards satisfactory to all concerned is difficult. The Committee on Scholarships made a careful study of this problem the past year, embodied in a report which with

slight amendment was adopted by the Committee on the Graduate School as a basis of procedure. Among other recommendations a preliminary allocation of funds to each department was approved so that in submitting recommendations each department committee might have an approximate idea of the number of students who may receive awards. This proved helpful in arriving at final allotments. The Scholarship Committee was aided in its work by department committees summarizing in each case the evidence upon which they based their recommendations for awards, and giving for new students an estimate of their probable scholastic rating based on Institute standards. The Dean in consultation with department committees was authorized to re-award scholarships which were declined, at the earliest possible date to those on the waiting lists. The allocation of tuition awards to staff members is now very satisfactorily taken care of by the appropriations asked for by heads of departments when submitting their budgets.

The scholarship budget for 1938–39 was $116,440, of which $36,830 was for tuition scholarships for members of the staff. The corresponding appropriations for 1939–40 were $113,890 and $37,450, respectively. The policy of gradually liquidating the half-tuition scholarships, which were initiated during the depression, eliminated these scholarships from the budget for 1939–40. The $6,000 which was appropriated for this purpose last year was, however, voted by the Executive Committee to provide six $1,000 fellowships open to teaching fellows or assistants whose work towards the doctorate had progressed to such a point that with one full year devoted exclusively to research they might reasonably expect to complete requirements for the Doctor's degree. The establishment of such fellowships was strongly urged by President Compton in his report last year, and it is hoped that the policy thus initiated will be continued and further extended.

The five fellowships provided last year by the Alfred P. Sloan Foundation for post-industrial students in Business and Engineering Administration and Economics and Social Science, proved so successful that the Foundation has increased the number to ten for the coming year. One hundred eighty-four applications for these fellowships were received and ten success-

ful candidates chosen upon the recommendation of a special committee after Professor Fiske, its chairman, had personal interviews with candidates and their employers. These students began their work last June as their course of study extends over a calendar year.

Twenty-nine per cent of our graduate students partially financed their graduate work by serving on the staff as teaching fellows or assistants. Nearly 80 per cent of these were studying for the Doctor's degree. The teaching fellow appointments open to students in the Departments of Science are regarded as among the most desirable offered in the Graduate School. During the past year 23 students were studying under special fellowships awarded by the Institute and 32 under fellowships awarded them by other Institutions or Foundations.

Again this year the number of awards relinquished between April 15 and June 1, after having been definitely accepted, was very large, amounting to $18,000 as compared with $15,250 last year. No explanation was offered by some students; others had accepted industrial or academic positions, while still others stated that "financial reasons" necessitated change of plans. There seems to be no way of making students realize that in accepting awards, only to relinquish them a few weeks later, they are depriving other students of scholarship assistance upon which attendance at the Institute may depend.

The outstanding development of the year for the Graduate School was the opening last September of the new Graduate House. This has more than met expectations in the way it is accomplishing the various purposes for which it was planned. Accommodating from 360 to 370 students, all rooms were occupied and there was a waiting list almost from the beginning. By assigning more students at their own request to some of the larger suites, it will be possible to increase accommodations this coming year to nearly 400. As there are comparatively few single rooms in the new House, two or more students share suites. Dr. Ashdown, the House Master, who has been so successful in choosing congenial roommates for students coming from all over the world, will continue to advise with Mr. Davis, the new Manager of Graduate House, in making these assignments.

For the first time graduate students now have their own

dining room. Dr. Ashdown has continued the custom of holding weekly dinners with guest speakers. The large attractive lounge and reading rooms are admirably suited for social gatherings, and the game and recreation rooms in the basement with nearby showers, have been greatly enjoyed and appreciated. The west dining room, which is open for luncheon to members of the staff as well as to students, and the adjacent lounge where coffee is served, have proved pleasant meeting grounds. The informal and cordial relations which exist between graduate students and staff have been the subject of much favorable comment, particularly among students from foreign countries where such conditions are for the most part unknown. Unless the Graduate School registration materially increases, the housing problem for our unmarried students may be considered as very satisfactorily solved. Beginning this fall attractive accommodations will also be available for married students in the recently acquired apartment house — Bexley Hall.

H. M. GOODWIN.

The Registrar. Last year the registration reached what we may term our normal level under the policy of stabilization of the Freshman Class. The total registration was 3,093, a gain of 127, or 4 per cent. This total was distributed among the classes as follows: Freshmen 656, Sophomores 559, Juniors 612, Seniors 574, and Graduate Students 692. Each of our undergraduate classes is now approximately 600 and the graduate class about 700. The distribution of these students among the three schools is as follows: Engineering 79 per cent, Science 18 per cent, and Architecture 3 per cent.

The variation in total registration has been our main interest for many years, but our recently established policy of stabilization of enrollment of the Freshman Class will now make this figure of less importance. Changing economic and social conditions, of course, will still affect the number and quality of the applicants. It seems very probable that with a stabilized size of entering class we may expect more variation in the quality of the class accepted for admission. The unreliability of any so-called fixed or even controlled standard for

comparison will probably make it difficult if not impossible to measure this variation in quality with any confident degree of precision.

The following two tables which are supplementary to the regular statistics have been useful during the period of attaining a stabilized level for showing the changes among the sources of our new students.

Table I shows the fluctuations of the number of new undergraduates during the last ten years.

TABLE I

NEW STUDENTS ENTERING THE UNDERGRADUATE SCHOOL

1929–1938

Year	New Students from Secondary Schools	College Transfers Entering Undergrad. Years	Total New Undergraduate Students	Total Undergraduate Registration
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
1938–39	612	142	754	2,401

The graduate student body was again the largest in the history of the Institute. Table II shows the changes during the past decade. These figures seem to indicate that about one-half of our graduate students are new each year and that of the new students about 30 per cent received their undergraduate training at Technology.

TABLE II

New Students Entering the Graduate School
1929–1938

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
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
1938–39	91	7	237	335	692

The statistics for the year 1938–39 follow.

J. C. MacKinnon.

All statistics on registration are as of November 1, 1938
All statistics on degrees are through June, 1939

TABLE 1

THE CORPS OF INSTRUCTORS

	'26	'27	'28	'29	'30	'31	'32	'33	'34	'35	'36	'37	'38
Faculty Members of the Staff	185	199	215	220	240	253	242	235	245	245	244	267	273
Professors	68	73	82	81	86	98	93	88	83	87	78	87	90
Associate Professors	55	58	61	59	63	68	60	57	69	81	87	89	98
Assistant Professors	51	58	64	71	80	79	81	80	82	68	70	76	72
Ex-Officio	—	—	—	2	4	3	3	5	6	6	6	5	6
Instructors	11	10	8	7	7	5	5	5	5	3	3	3	3
Research Associates	—	—	—	—	—	—	—	—	—	—	—	7	4
Other Members of the Staff	264	268	272	295	323	335	283	263	272	284	291	331	368
Instructors	116	115	119	116	123	133	105	90	86	90	97	101	97
Teaching Fellows	—	—	—	—	—	—	21	22	20	24	51	52	52
Assistants	63	55	53	68	70	96	45	43	70	76	64	69	79
Technical Assistants	—	—	—	—	—	—	28	31	28	—	—	—	—
Lecturers	23	30	29	32	32	34	28	25	25	24	19	29	28
Research Associates	24	29	22	21	31	31	32	25	22	27	31	22	25
Research Assistants	38	39	49	58	65	36	20	21	18	30	24	42	72
Research Fellows (D.I.C.)	—	—	—	—	2	5	3	3	2	1	—	—	—
Research Fellows	—	—	—	—	—	—	—	3	1	12	5	16	15
Special Investigator	—	—	—	—	—	—	1	—	—	—	—	—	—
Total	449	467	487	515	563	588	525	498	517	529	535	598	641
Other Members of the Faculty	14	13	11	14	15	15	17	25	26	27	31	28	28
Professors: Emeriti	6	6	4	4	6	7	13	21	23	24	29	27	27
Retired	5	4	3	4	3	3	—	—	—	—	—	—	—
Non-Resident	3	3	4	6	6	5	4	4	3	3	2	1	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	1938–39	3,093
1889–90	909	1914–15	1,816		

TABLE 3

Classification of Students by Courses and Years

Course Name and Number	1936–37 YEAR						1937–38 YEAR						1938–39 YEAR					
	1	2	3	4	G	Total	1	2	3	4	G	Total	1	2	3	4	G	Total
Aeronautical Engineering XVI	86	28	28	32	30	204	71	28	32	28	32	191	95	30	30	34	25	214
Meteorology (in Aero. Eng. Department)	—	—	—	—	17	17	—	—	—	—	19	19	—	—	—	—	16	16
Architectural Engineering IV-A	5	1	3	3	—	12	—	—	1	4	—	5	—	—	—	2	—	2
Architecture IV, IV-B, IV-C	16	15	16	13	22	82	17	16	19	17	21	90	9	21	19	16	18	83
Architecture (IV, IV-B, IV-C) Fifth Year	—	—	—	15	—	15	—	—	—	21	—	21	—	—	—	17	—	17
Biology and Public Health VII	16	15	17	19	24	91	6	19	22	19	22	88	6	9	15	15	30	75
Biophysics and Biological Engineering VII-A	—	—	—	—	—	—	2	1	1	2	—	6	4	2	1	1	3	11
Building Engineering and Construction XVII	4	11	4	4	—	23	6	4	12	5	—	27	8	7	6	8	—	29
Business and Engineering Administration XV	65	67	60	64	18	274	56	79	57	53	24	269	52	70	58	57	28	265
Chemical Engineering X	133	80	73	45	59	390	124	94	66	62	87	433	153	89	73	69	84	468
Chemical Engineering Practice X-A, X-B	—	—	—	2	60	62	—	—	—	3	37	40	—	—	—	—	56	56
Chemistry V	37	31	19	12	77	176	32	32	25	21	76	186	34	27	25	30	87	203
Civil Engineering I	26	29	27	15	25	122	25	12	25	25	36	123	21	21	20	22	30	114
Army Engineer (in Civil Eng. Department)	—	—	—	—	11	11	—	—	—	—	15	15	—	—	—	—	17	17
Economics and Engineering or Science	—	—	—	—	7	7	—	—	—	—	3	3	—	—	—	—	4	4
Electrical Engineering VI, VI-B, VI-C	65	39	55	41	65	265	73	39	55	41	68	276	64	48	53	60	73	298
Electrical Engineering (Coöperative) VI-A	42	49	24	33	31	179	28	50	38	28	32	176	35	34	22	35	24	150
Electrochemical Engineering XIV	5	7	6	5	—	23	7	4	6	4	1	22	—	—	2	7	—	9
General Engineering IX-B	5	9	13	20	—	47	4	16	17	27	—	64	7	12	34	20	—	73
General Science IX-A	5	4	6	5	—	20	—	9	8	8	—	25	3	2	12	16	—	33
Geology XII	3	6	1	1	15	26	1	4	3	2	22	32	6	8	6	6	19	45
Marine Transportation XIII-C	5	7	2	5	—	19	6	8	6	5	—	25	6	7	6	7	—	26
Mathematics XVIII	4	1	3	2	10	20	3	6	2	3	13	27	6	2	4	3	13	28
Mechanical Engineering II	70	78	55	41	46	290	85	108	62	49	35	339	95	91	80	68	43	377
Army Ordnance (in Mech. Eng. Department)	—	—	—	—	10	10	—	—	—	—	12	12	—	—	—	—	10	10
Torpedo Engineering (in Mech. Eng. Dept.)	—	—	—	—	2	2	—	—	—	—	2	2	—	—	—	—	2	2
Mechanical Engineering (Coöperative) II-A	—	—	9	9	3	21	—	—	11	7	11	29	—	—	7	8	7	22
Metallurgy XIX	8	22	11	17	15	73	14	23	18	11	13	79	12	27	23	23	19	104
Ceramics (in Metallurgy Department)	—	—	—	—	8	8	—	—	—	—	5	5	—	—	—	—	4	4
Mining Engineering III	5	10	5	7	5	32	8	9	7	5	6	35	—	—	10	7	8	25
Naval Architecture and Marine Engineering XIII	21	12	22	19	—	74	19	22	15	19	—	75	21	9	21	11	1	63
Naval Construction XIII-A	—	—	8	7	8	23	—	—	6	8	7	21	—	—	10	9	9	28
Physics VIII	23	19	22	21	49	134	18	23	17	20	59	137	19	35	26	21	59	160
Sanitary Engineering XI	—	—	3	1	2	6	—	1	—	2	3	6	—	—	4	—	3	7
Unclassified	1	13	13	8	—	35	—	13	46	4	—	63	—	8	45	2	—	55
Totals	650	553	505	466*	619	2,793	605	620	577	503*	661	2,966	656	559	612	574*	692	3,093

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

TABLE 4-A

Classification of Students by Courses, Options, and Years

COURSE NO.	NAME	OPTION	Option	YEAR 1 Opt.	1 Tot.	2 Opt.	2 Tot.	3 Opt.	3 Tot.	4 Opt.	4 Tot.	GRAD. Opt.	GRAD. Tot.	TOTAL	COURSE NUMBER
I	Civil Engineering			21	21	21	21	20	20	22	22	30	47	131	I
		Army Engineer		—		—		—		—		17			
II	Mechanical Eng.	1. General	1	—		—		—		22					
		2. Automotive	2	—		—		—		16					
		3. Refrig. and Air Condition.	3	—		—		—		13		43			
		4. Materials and Design	4	—	95	—	91	—	80	17	68		55	389	II
		5. Textile	5	—		—		—		—					
		Army Ordnance		—		—		—		—		10			
		Torpedo Engineering		—		—		—		—		2			
II-A	Mechanical Engineering — Coöperative			—	—	—	—	—	7	—	8	—	7	22	II-A
III	Mining Eng.	1. Mining	1	—	—	—	—	5	10	5	7	8	8	25	III
		2. Petroleum Production	2	—		—		5		2		—			
IV	Architecture			—	9	—	21	—	19	—	14	—	9	89	IV
	Fifth Year			—		—		—		—	17	—	—	2	IV-A
IV-A	Architectural Engineering			—		—		—		—	2	—	8	10	IV-B
IV-B	City Planning			—		—		—		—	2	—	—		
	Fifth Year			—		—		—		—	—	—	1	1	IV-C
IV-C	City Planning Practice			—		—		—		—	—	—	—		
	Fifth Year			—		—		—		—	—	—	87	203	V
V	Chemistry			—	34	—	27	—	25	—	30	—	73	218	VI
VI	Electrical Engineering			—	63	—	46	—	16	—	20	—	24	150	VI-A
VI-A	Electrical Engineeering — Coöperative			—	35	—	34	—	22	—	35	—	—	14	VI-B
VI-B	Electrical Engineering — Illuminating			—	1	—	2	—	7	—	4	—	—	66	VI-C
VI-C	Electrical Engineering — Communications			—		—		—	30	—	36	—			
VII	Biology and Public Health	1a. Biology & Public Health	1a	3		3		11		7		—	30	75	VII
		1b. Biology	1b	—	6	—	9	2	15	—	15	—			
		2. Industrial Biology	2	3		6		2		4		—			
		3. Public Health Eng.	3	—		—		—		4		—			
VII-A	Biophysics and Biological Engineering			—	4	—	2	—	1	—	1	—	3	11	VII-A
VIII	Physics	1. General	1	12	19	14	35	9	26	13	21	—	59	160	VIII
		2. Applied	2	7		21		17		8		—			
IX-A	General Science			—	3	—	2	—	12	—	16	—	—	33	IX-A
IX-B	General Engineering			—	7	—	12	—	34	—	20	—	—	73	IX-B
X	Chemical Engineering			—	153	—	89	—	73	—	69	—	84	468	X
X-A	Chemical Engineering Practice — Graduate			—		—		—		—		—	56	56	X-A
XI	Sanitary Engineering			—	—	—	—	—	4	—	—	—	3	7	XI

(*Continued on page 48*)

TABLE 4-A (*Continued*)

Classification of Students by Courses, Options, and Years

COURSE NO.	COURSE NAME	COURSE OPTION	Option	YEAR 1 Opt.	YEAR 1 Tot.	YEAR 2 Opt.	YEAR 2 Tot.	YEAR 3 Opt.	YEAR 3 Tot.	YEAR 4 Opt.	YEAR 4 Tot.	GRAD. Opt.	GRAD. Tot.	TOTAL	COURSE NUMBER
XII	Geology	1. Geology	1	2	6	6	8	5	6	6	6	—	19	45	XII
		2. Mineral Resources	2	4		2		1		—		—			
XIII	Naval Architecture and Marine Engineering			—	21	—	9	—	21	—	11	—	1	63	XIII
XIII-A	Naval Construction			—	—	—	—	—	10	—	9	—	9	28	XIII-A
XIII-C	Marine Transportation			—	6	—	7	—	6	—	7	—	—	26	XIII-C
XIV	Electrochemical Engineering			—	—	—	—	—	2	—	7	—	—	9	XIV
XV	Business and Eng. Admin.	1. Physical Sciences	1	33	52	51	70	34	58	44	57	—	28	265	XV
		2. Chemical Sciences	2	19		19		24		13		—			
XVI	Aeronautical Engineering	— Aeronautics		95	95	30	30	30	30	34	34	25	41	230	XVI
		— Meteorology		—		—		—		—		16			
XVII	Building Engineering and Construction			—	8	—	7	—	6	—	8	—	—	29	XVII
XVIII	Mathematics			—	6	—	2	—	4	—	3	—	13	28	XVIII
XIX	Metallurgy			12	12	27	27	23	23	23	23	19	23	108	XIX
		Ceramics		—		—		—		—		4			
	Economics & Eng. or Sci	— Engineering		—	—	—	—	—	—	—	—	3	4	4	Ec. & Eng. or Sci.
		— Science		—		—		—		—		1			
	Unclassified			—	—	—	8	—	45	—	2	—	—	55	Unc.
Total					656		559		612		574*		692	3,093	Total

* This total includes fifth year in Architecture.

TABLE 4-B

Classification of Special Students by Courses and Years
(Included in Table 4-A)

COURSE	OPT.	YEAR 1	2	3	4	G	TOTAL	COURSE
I Civil Engineering		—	—	—	—	1	1	I
II Mechanical Engineering		—	—	1	—	3	4	II
III Mining Engineering		—	—	2	—	—	2	III
IV Architecture		2	1	2	3	—	9	IV
Fifth Year		—	—	—	1	—		
V Chemistry		—	—	—	4	—	4	V
VI Electrical Engineering		—	—	2	—	5	7	VI
VI-C Electrical Engineering (Communications)		—	—	—	2	—	2	VI-C
VII Biology and Public Health		—	2	3	9	3	17	VII
VIII Physics		—	—	—	1	4	5	VIII
IX-B General Engineering		—	—	1	—	—	1	IX-B
X Chemical Engineering		—	1	—	1	4	6	X
X-A Chemical Engineering Practice		—	—	—	—	2	2	X-A
XI Sanitary Engineering		—	—	2	—	—	2	XI
XII Geology		—	—	—	1	—	1	XII
XIII Naval Architecture and Marine Engineering		—	—	—	1	—	1	XIII
XV Business and Engineering Administration		—	—	—	1	5	6	XV
XVI Aeronautical Engineering	Aero.	—	—	—	1	1	4	XVI
	Meteor.	—	—	—	—	2		
XVII Building Engineering and Construction		—	1	—	—	—	1	XVII
XIX Metallurgy		—	1	1	2	1	5	XIX
Total		2	6	14	27*	31	80	

* 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 1	2	3	4	G	TOTAL	COURSE
I Civil Engineering		1	1	2	—	1	5	I
II Mechanical Engineering		3	3	2	3	5	16	II
IV Architecture, Fifth Year		—	—	—	1	—	1	IV
V Chemistry		—	1	—	3	3	7	V
VI Electrical Engineering		3	—	1	1	2	7	VI
VI-C Electrical Engineering (Communications)		—	—	—	2	—	2	VI-C
VII Biology and Public Health		1	—	1	—	1	3	VII
VIII Physics		—	1	1	1	2	5	VIII
IX-A General Science		—	—	1	2	—	3	IX-A
IX-B General Engineering		—	—	3	1	—	4	IX-B
X Chemical Engineering		2	—	2	1	2	7	X
XII Geology		—	—	1	—	1	2	XII
XIII Naval Architecture and Marine Engineering		1	—	1	—	—	2	XIII
XV Business and Engineering Administration		2	1	3	1	3	10	XV
XVI Aeronautical Engineering	Aero.	1	—	1	2	4	9	XVI
	Meteor.	—	—	—	—	1		
XVII Building Engineering and Construction		1	—	—	—	—	1	XVII
XIX Metallurgy		—	—	1	—	—	1	XIX
Unclassified		—	1	3	1	—	5	Unc.
Total		15	8	23	19*	25	90	

† Excluding six special students.
* This total includes Fifth Year in Architecture.

TABLE 5

Classification of Students by Courses since 1931

	1931–32	1932–33	1933–34	1934–35	1935–36	1936–37	1937–38	1938–39
Engineering Courses . . . . . *Total*	2,495	2,197	2,008	1,961	2,028	2,187	2,288	2,379
Aeronautical Engineering XVI	193	193	162	183	200	221	210	230
Architectural Engineering IV-A	53	34	31	23	17	12	5	2
Building Engineering and Construction XVII	67	45	43	31	32	23	27	29
Business and Engineering Administration XV	378	371	343	305	280	274	269	265
Chemical Engineering X, X-A, X-B	402	315	323	356	414	452	473	524
Civil Engineering I, I-A	224	175	142	129	142	122	123	114
Army Engineer (In Civil Engineering Department)	—	—	—	—	—	11	15	17
Electrical Engineering VI, VI-A, VI-B, VI-C	502	443	395	380	381	444	452	448
Electrochemical Engineering XIV	45	42	35	38	27	23	22	9
Fuel and Gas Engineering	9	—	—	—	—	—	—	—
General Engineering IX-B	43	32	35	52	61	47	64	73
Mechanical Engineering II, II-A	344	315	270	255	274	313	370	401
Army Ordnance (In Mechanical Engineering Department)	10	11	9	9	10	10	12	10
Metallurgy XIX	70	58	65	50	60	81	84	108
Mining Engineering III	44	36	35	32	28	32	35	25
Naval Architecture and Marine Eng. XIII, XIII-C	89	93	90	90	80	93	100	89
Naval Construction XIII-A	20	34	26	25	23	23	21	28
Sanitary Engineering XI	12	11	13	12	9	6	6	7
Science Courses . . . . . *Total*	439	439	439	405	382	467	501	555
Biology and Public Health VII, VII-A	100	94	92	81	65	91	94	86
Chemistry V	158	146	145	137	140	176	186	203
General Science IX-A	4	10	12	10	12	20	25	33
Geology XII	20	20	21	16	15	26	32	45
Mathematics XVIII	32	31	28	35	26	20	27	28
Physics VIII	125	138	141	126	124	134	137	160
Architecture IV, IV-B, IV-C . . . . . *Total*	190	159	135	120	100	97	111	100
Economics and Engineering or Science . . . . . *Total*	—	—	—	—	2	7	3	4
Unclassified . . . . . *Total*	54	25	15	12	18	35	63	55
Grand Total	3,188	2,831	2,606	2,507	2,540	2,793	2,966	3,093

TABLE 6

GEOGRAPHICAL CLASSIFICATION OF STUDENTS SINCE 1934

UNITED STATES	1934	1935	1936	1937	1938
North Atlantic . . . . . Total	1,919	1,877	1,979	2,026	2,057
Connecticut	76	92	109	113	125
Maine	37	28	33	26	20
Massachusetts	1,148	1,088	1,092	1,077	1,032
New Hampshire	33	23	21	23	22
New Jersey	136	143	154	169	169
New York	326	361	400	432	492
Pennsylvania	110	104	127	142	146
Rhode Island	36	29	30	35	40
Vermont	17	9	13	9	11
South Atlantic . . . . . Total	82	106	139	139	170
Delaware	4	7	12	14	14
District of Columbia	32	36	34	32	40
Florida	3	7	10	13	18
Georgia	2	7	10	6	10
Maryland	19	20	23	29	30
North Carolina	5	7	11	8	8
South Carolina	2	3	3	2	7
Virginia	12	12	26	24	25
West Virginia	3	7	10	11	18
South Central . . . . . Total	51	51	70	94	105
Alabama	2	3	6	12	16
Arkansas	2	1	3	3	6
Kentucky	9	14	13	12	15
Louisiana	9	8	13	14	11
Mississippi	2	2	5	5	3
Tennessee	7	7	7	10	9
Texas	20	16	23	38	45
North Central . . . . . Total	238	262	293	350	365
Illinois	66	76	91	106	111
Indiana	12	16	12	14	15
Iowa	7	8	6	8	7
Kansas	6	6	7	10	10
Michigan	21	18	26	34	39
Minnesota	17	15	19	18	11
Missouri	33	39	35	41	40
Nebraska	4	4	3	5	8
North Dakota	1	5	4	4	2
Ohio	52	58	73	95	105
South Dakota	1	3	1	1	—
Wisconsin	18	14	16	14	17
Western . . . . . Total	90	101	119	129	155
Arizona	2	2	2	3	2
California	32	38	44	46	49
Colorado	15	23	25	26	28
Idaho	1	—	2	2	3
Montana	3	—	8	6	12
Nevada	—	—	1	2	3
New Mexico	4	6	4	5	4
Oklahoma	6	5	6	6	13
Oregon	8	6	5	7	11
Utah	1	4	4	6	6
Washington	18	16	16	19	21
Wyoming	—	1	2	1	3
Territories and Dependencies . Total	5	4	12	12	10
Canal Zone	—	—	2	1	1
Hawaii	3	1	4	6	4
Puerto Rico	2	3	6	5	5
Total for United States	2,385	2,401	2,612	2,750	2,862

(Continued on page 52)

TABLE 6 (*Continued*)

Foreign Countries	1934	1935	1936	1937	1938
Total	122	139	181	216	231
Argentina	3	5	7	2	5
Australia	—	2	2	2	—
Austria	3	2	1	1	1
Belgium	2	2	1	—	2
Bermuda	1	—	—	—	—
Brazil	2	1	2	1	1
British West Indies	2	—	—	1	3
Canada	24	29	30	37	52
Chile	1	—	—	—	—
China	28	35	50	57	37
Colombia	3	1	2	6	6
Cuba	7	12	11	14	10
Czechoslovakia	—	—	—	—	1
Denmark	—	1	—	1	1
Dominican Republic	—	—	—	1	1
Dutch West Indies	—	—	—	—	1
Ecuador	1	—	—	—	—
England	3	6	11	8	11
France	2	1	4	5	5
Germany	2	1	3	2	4
Guatemala	—	1	1	1	—
Haiti	—	—	—	2	1
Honduras	—	2	2	1	2
Hungary	—	—	1	—	—
India	6	6	11	8	10
Iraq	2	2	—	1	—
Ireland	1	1	1	—	1
Italy	1	—	—	2	4
Japan	7	5	4	2	1
Mexico	5	4	5	7	7
Netherland Indies	1	1	1	1	—
Netherlands	1	1	2	4	5
Newfoundland	1	—	—	1	1
New Zealand	—	—	1	2	—
Norway	1	1	2	2	3
Panama	2	1	1	—	1
Paraguay	—	—	—	—	1
Persia	—	1	—	—	—
Peru	—	—	1	1	2
Philippine Islands	—	—	8	13	14
Poland	—	1	—	—	2
Salvador	—	—	—	—	2
Scotland	—	1	1	—	1
Siam	1	1	4	9	8
South Africa	—	—	—	—	1
Spain	—	—	—	1	1
Sweden	—	1	—	1	2
Switzerland	3	1	3	3	4
Syria	1	1	1	2	1
Turkey	1	2	4	6	8
Union of South Africa	2	4	3	5	3
Union of Socialistic Soviet Republics	1	1	—	—	3
Venezuela	1	2	—	3	1
Grand Total, United States and Foreign	2,507	2,540	2,793	2,966	3,093

TABLE 7

Women Students Classified by Courses and Years

COURSE	YEAR					Total
	1	2	3	4	G	
IV Architecture	1	5	4	3	1	14
Fifth Year	—	—	—	3	—	3
IV-B City Planning	—	—	—	—	1	1
V Chemistry	1	2	1	3	3	10
VII Biology and Public Health	1	1	2	2	5	11
VIII Physics	1	1	—	1	—	3
IX-A General Science	1	—	—	2	—	3
IX-B General Engineering	—	—	1	—	—	1
XII Geology	—	—	—	—	1	1
XV Business and Engineering Administration	—	—	1	—	—	1
XVIII Mathematics	—	—	1	—	1	2
Total	5	9	10	14*	12	50

* This total includes Fifth Year in Architecture.

TABLE 8

Old and New Students

Year	1933–34	1934–35	1935–36	1936–37	1937–38	1938–39
Students registered at end of last academic year (including specials)	1,748	1,568	1,558	1,634	1,843	1,955
Students who have previously attended the Institute, but were not registered at end of last academic year (including specials)	120	124	91	110	124	96
New students who entered by examination	241	214	194	190	162	213
New students who entered without examination	187	253	287	371	377	399
New students who entered from other colleges as candidates for degrees	266	302	361	432	395	379
New students (specials, not candidates for degrees)	44	46	49	56	65	51
Total	2,606	2,507	2,540	2,793	2,966	3,093

TABLE 9

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

College		College		College	
Alabama Polytechnic Inst.	2	Middlebury College	1	University of California	6
A.& M. Coll. of Texas	4	Middlesex School of Med. and Surg.	1	University of Chicago	6
Alma College	1	Missouri Valley College	1	University of Cincinnati	2
Amherst College	4	Montana School of Mines	2	University of Colorado	5
Armour Institute of Tech.	4	Montana State Univ.	4	University of Dayton	1
Baldwin-Wallace College	1	Morris Harvey College	1	University of Denver	6
Bates College	3	Nebraska Wesleyan Univ.	1	University of Florida	1
Berea College	1	New York University	4	University of Idaho	1
Boston College	2	Northeastern University	1	University of Illinois	8
Boston University	2	Oberlin College	6	University of Kansas	4
Bowdoin College	4	Ohio State University	2	Univ. of Kansas City	1
Brigham Young Univ.	1	Ohio University	2	University of Kentucky	5
Brooklyn College	3	Oklahoma A. & M. Coll.	2	University of Maine	5
Brown University	5	Oregon Inst. of Tech.	1	University of Maryland	1
California Inst. of Tech.	5	Oregon State College	4	University of Michigan	10
Carleton College	1	Park College	1	University of Minnesota	4
Carnegie Inst. of Tech.	3	Parsons College	1	University of Nebraska	1
Case School of App. Sci.	1	Pennsylvania State Coll.	8	University of Nevada	2
Catholic Univ. of America	1	Piedmont College	1	Univ. of New Hampshire	2
Central College	1	Polytechnic Institute of Brooklyn	1	Univ. of North Dakota	1
Clemson Agric. College	1	Pomona College	2	University of Notre Dame	5
Coe College	1	Princeton University	6	University of Oklahoma	2
College of Charleston	1	Providence College	1	Univ. of Pennsylvania	11
College of City of N. Y.	13	Purdue University	5	University of Pittsburgh	3
Coll. of Holy Cross(Mass.)	1	Randolph-Macon College for Men	1	University of Richmond	2
Coll. of William & Mary	2	Rensselaer Poly. Inst.	4	University of Rochester	4
College of Wooster	1	Rhode Island State Coll.	2	University of Santa Clara	1
Colorado College	1	Rice Institute	5	Univ. of Southern Calif.	1
Columbia Univ. (N. Y.)	8	Roanoke College	2	University of Tennessee	3
Cooper Union	2	Rockhurst College	1	University of Texas	6
Cornell University	6	Rutgers University	1	Univ. of City of Toledo	1
Dartmouth College	14	St. Anselm's College	1	Univ. of Vermont and State Agric. College	1
Denison University	2	St. Lawrence University	2	University of Virginia	2
Doane College	1	St. Louis University	1	University of Washington	10
Drake University	1	St. Michael's College	1	Ursinus College	2
Drexel Institute	3	Simmons College	2	Utah State Agric. Coll.	2
Emmanuel College	1	Smith College	2	Vanderbilt University	2
Franklin & Marshall Coll.	1	Southwestern College	1	Virginia Military Inst.	2
Georgetown University	2	Spring Hill College	1	Washington College	1
George Washington Univ.	1	Stanford University	14	Washington and Jefferson College	1
Georgia School of Tech.	10	State Coll.of Washington	2	Washington & Lee Univ.	2
Hamilton College	2	State University of Iowa	2	Washington Univ. (Mo.)	2
Hardin-Simmons Univ.	1	Stevens Inst. of Tech.	2	Webb Inst. of Naval Arch.	1
Harvard University	30	Suffolk Law School	1	Wellesley College	2
Haverford College	4	Swarthmore College	5	Wesleyan University	3
Hendrix College	1	Syracuse University	3	Westminster Coll. (Pa.)	1
Hobart College	1	Tarkio College	1	West Virginia University	2
Howard College	1	Temple University	3	Wheaton College (Mass.)	1
Indiana University	3	Texas Tech. College	3	Williams College	7
Iowa State Coll.of A.&M.A.	1	The Citadel	1	Wilson College	1
Kansas State Coll.of A.&AS.	2	Tufts College	7	Woodstock College	2
Kent State University	1	Tulane University of La.	2	Worcester Poly. Inst.	3
Kenyon College	1	Union College (N. Y.)	1	Yale University	8
Lafayette College	3	U. S. Coast Guard Acad.	1		
Lehigh University	10	U. S. Military Academy	29	Total	760
Louisiana State Univ.	2	U. S. Naval Academy	32	Number of American Colleges Represented	176
Lowell Textile Institute	1	University of Akron	2	Number of Foreign Colleges Represented (Not listed)	68
Lynchburg College	1	University of Alabama	2	Total	244
Marshall College	1	University of Arizona	1		
Mass. Inst. of Tech.	194	University of Arkansas	2		
Mass. State College	4				
Miami University	2				
Mich. State Coll. A.&A.S.	1				

TABLE 10. NEW STUDENTS ENTERING FROM OTHER COLLEGES AS CANDIDATES FOR DEGREES

Class Joined at the Institute	Years Spent at College				Total
	One	Two	Three	Four or more	
First year	18	7	2	—	27
Second year	14	31	7	6	58
Third year	—	8	12	26	46
Fourth year	—	—	4	7	11
Graduate year	—	—	10	227	237
Total	32	46	35	266	379

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			Entered							
				Sept. 1938		Previous Years					
	Sept. 1938	Previous Years	Total	Undergrad.	Grad.	Undergrad.	Grad.	Total	S. B. Degree June 1938	Other Graduates	Total
Aeronautical Engineering XVI	5	17	22	1	16	5	18	40	4	—	4
Architecture IV, IV-B, IV-C	6	13	19	1	9	4	4	18	4	1	5
Biology and Public Health VII, VII-A	—	3	3	1	7	—	15	23	3	5	8
Building Engineering and Construction XVII	1	—	1	1	—	1	—	2	—	—	—
Business and Engineering Administration XV	8	23	31	1	14	1	5	21	1	3	4
Chemical Engineering X, X-A	19	29	48	2	55	2	58	117	18	3	21
Chemistry V	1	6	7	1	14	—	47	62	5	21	26
Civil Engineering I	7	12	19	1	19	—	8	28	1	1	2
Army Engineer (in Civil Eng. Department)	—	—	—	—	17	—	—	17	—	—	—
Economics and Engineering or Science	—	—	—	—	—	—	—	—	4	—	4
Electrical Engineering VI, VI-A, VI-B, VI-C	19	33	52	4	30	12	23	69	30	9	39
Electrochemical Engineering XIV	—	3	3	—	—	—	—	—	—	—	—
General Engineering IX-B	4	5	9	1	—	1	—	2	—	—	—
General Science IX-A	—	2	2	—	—	1	—	1	—	—	—
Geology XII	3	2	5	—	4	2	12	18	1	2	3
Mathematics XVIII	1	1	2	—	4	—	6	10	1	2	3
Mechanical Engineering II, II-A	21	38	59	2	14	6	13	35	11	11	22
Army Ordnance (in Mech. Eng. Department)	—	—	—	—	10	—	—	10	—	—	—
Metallurgy XIX	1	6	7	—	7	1	9	17	2	4	6
Mining Engineering III	2	2	4	—	4	—	3	7	1	—	1
Naval Architecture XIII, XIII-C	2	10	12	1	1	1	—	3	—	—	—
Naval Construction XIII-A	1	1	2	8	—	9	8	25	1	—	1
Physics VIII	6	6	12	—	11	—	33	44	4	7	11
Sanitary Engineering XI	—	—	—	—	1	—	1	2	—	1	1
Unclassified	8	9	17	2	—	1	—	3	—	—	—
Total	115	221	336	27	237	47	263	574	91	70	161

TABLE 12

NUMBER OF DEGREES AWARDED IN DECEMBER, 1938 AND JUNE, 1939

Name of Course	S.B.		B.Arch.		S.M.		M.Arch. and M.C.P.		Ph.D. and Dr.P.H.		Sc.D.		Totals	
	Dec. '38	June '39	Dec. '38	June '39	Dec. '38	June '39	Dec. '38	une '39	Dec. '38	June '39	Dec. '38	June '39	Dec. '38	June '39
Aeronautical Engineering	1	30	—	—	3	3	—	—	—	—	—	1	4	34
Architectural Engineering	—	2	—	—	—	—	—	—	—	—	—	—	—	2
Architecture	—	—	3	13	—	—	—	5	—	—	—	—	3	18
Biology	—	1	—	—	—	—	—	—	—	1	—	—	—	2
Biology and Public Health	—	1	—	—	—	—	—	—	—	1*	—	—	—	2
Biophysics and Biological Engineering	—	1	—	—	—	1	—	—	—	—	—	—	—	2
Building Engineering and Construction	—	7	—	—	—	—	—	—	—	—	—	—	—	7
Business and Engineering Administration	8	52	—	—	—	8	—	—	—	—	—	—	8	60
Ceramics	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Chemical Engineering	6	50	—	—	9	8	—	—	—	—	4	7	19	65
Chemical Engineering Practice	1	10	—	—	8	16	—	—	—	—	—	—	9	26
Chemistry	2	24	—	—	—	1	—	—	4	19	—	—	6	44
City Planning	—	—	—	—	—	—	—	1	—	—	—	—	—	1
Civil Engineering	1	21	—	—	20	7	—	—	—	—	—	2	21	30
Economics and Engineering	—	—	—	—	—	3	—	—	—	—	—	—	—	3
Electrical Engineering (Inc. VI-A)	12	67	—	—	13	29	—	—	—	—	—	—	25	96
Electrochemical Engineering	1	7	—	—	1	—	—	—	—	—	—	—	2	7
General Engineering	5	18	—	—	—	—	—	—	—	—	—	—	5	18
General Science	1	12	—	—	—	—	—	—	—	—	—	—	1	12
Geology	—	4	—	—	—	2	—	—	1	4	1	—	2	10
Industrial Biology	1	2	—	—	—	—	—	—	—	—	—	—	1	2
Marine Transportation	1	—	—	—	—	—	—	—	—	—	—	—	1	—
Mathematics	—	—	—	—	—	1	—	—	1	2	—	—	1	3
Mechanical Engineering (Inc. II-A)	3	70	—	—	6	16	—	—	—	—	1	—	10	86
Metallurgy	—	19	—	—	—	5	—	—	—	—	1	4	1	28
Meteorology	—	—	—	—	1	5	—	—	—	—	—	1	1	6
Mining Engineering	1	8	—	—	—	4	—	—	—	—	—	—	1	12
Naval Architecture and Marine Engineering	2	6	—	—	—	—	—	—	—	—	—	—	2	6
Naval Construction	—	—	—	—	—	8	—	—	—	—	—	—	—	8
Physics	—	14	—	—	2	2	—	—	3	4	1	2	6	22
Public Health Engineering	1	1	—	—	—	1	—	—	—	—	—	—	1	2
Sanitary Engineering	—	—	—	—	—	1	—	—	—	—	—	—	—	1
Without Course Classification	—	—	—	—	11	22	—	—	—	—	—	—	11	22
Totals	47	427	3	13	74	143	—	6	9	31	8	18	141	638

* Degree of Dr. P.H.

TABLE 13

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

Class	Aeronautical Eng.	Architectural Eng.†	Architecture	Biology or Natural Hist. (Inc. VII-A)	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)	Metallurgy**	Military Eng.	Mining Eng. and Metallurgy	Naval Arch.	Physics	Sanitary Eng.	Total	Total by Decades
1868										6				1			1			6				14	
1869									1	2							2							5	
1870									1	4				1			2							10	29
1871									2	8							2							17	
1872									3	3							1							12	
1873			1						7	12				1			2							26	
1874			1							10				2			4							18	
1875			1						1	10							7				1			28	
1876			1						5	12				4			8			8	3			43	
1877			4						2	12							6			8				32	
1878			3						3	8							2			2				19	
1879			1	1					3	6							8			3	1			23	
1880									1	3										3				8	226
1881			3	1					8	3				2			5			6				28	
1882			3	1					6	2				1			5			5	1			24	
1883			1						3	3							7			5				19	
1884									12	5							6			13				36	
1885			2						4	4	2			1			7			8				28	
1886			1	1					7	9	10			1			23			7				59	
1887			1	1					9	10	8			3			17			8	1			58	
1888			5	3					10	11	17			1			25			4	1			77	
1889			3	1					8	14	17			2			24			5	1			75	
1890			5	3					13	25	18			6			28			3	2			103	507
1891			6	3			7		11	18	23			1	1		26			4	3			103	
1892			13	6			4		7	22	36			7	1		26			4	1	6		133	
1893			2	2			8		8	25	41			6	2		30			5				129	
1894			14	1			12		11	21	33			5			31			4	3	3		138	
1895			15				11		14	25	33			4			30			3	5	2		146	
1896			24	3			7		17	26	48			7	3		34			10	5	3		191	
1897			16	2			12		20	25	33			7	1		40			7	9	3		179	
1898			29	3			9		25	32	33			6			41			7	7	4		199	
1899			22	2			10		22	30	32			1			37			9	8	2		176	
1900			21	3			11		19	32	23			5			34			21	9	3		185	1,579
1901			21	1			14		17	37	25			6	1		39			18	16	1		200	
1902			18	5			9		14	24	35			3			46			14	14	3		192	
1903			15	1			10		13	26	39	1		1	1		37			27	12	3		190	
1904			24	3			7		15	34	34	8		1	1		45			32	17	5		232	
1905			12	3			13		23	46	31	3		3	1		54			26	24			244	
1906			22	2			10		21	47	37	3					69			38	19			278	
1907			21				14		10	37	32	5			2		52			22	10			208	
1908			19	4			15		16	48	38	2					62			19	5			230	
1909			18	5			13		12	51	42	3					41			30	5	3		232	
1910			18	3			18		10	57	36	3		2			57			24	11		12	251	2,257

(*Continued on page 58*)

TABLE 13 (*Continued*)

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

Class	Aeronautical Eng.	Architectural Eng.‡	Architecture	Biology or Natural Hist.(Inc. VII-A)	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)	Metallurgy**	Military Eng.	Mining Eng. and Metallurgy	Naval Arch.	Physics	Sanitary Eng.	Total	Total by Decades
1911	—	—	10	1	—	—	19	—	12	46	49	5	—	2	—	—	49	—	—	17	6	1	15	232	
1912	—	—	21	4	—	—	31	—	7	55	52	3	—	1	—	—	47	—	—	21	3	2	14	261	
1913	—	—	26	2	—	—	30	—	12	58	43	8	—	—	—	—	50	—	—	20	4	1	15	269	
1914	—	—	19	6	—	—	37	—	9	60	51	8	—	4	—	—	65	—	—	17	8	1	19	304	
1915	—	—	30	3	—	—	33	—	23	49	42	10	—	3	—	—	69	—	—	5	7	3	12	289	
1916	—	—	37	5	—	—	32	—	11	45	56	14	—	2	—	—	84	—	—	5	9†	3	18	321	
1917	—	—	27	10	—	37	43	—	13	49	45	10	—	5	2	—	63	—	—	14	9†	1	17	345	
1918	—	—	28	7	—	29	40	—	10	45	50	11	2	4	1	—	75	—	—	10	4	3	5	324	
1919	—	—	16	9	—	28	44	—	8	45	50	6	3	1	—	—	66	—	—	7	7	4	6	299	
1920	—	—	19	2	—	48	63	—	6	52	30	9	1	4	—	—	55	—	—	13	12	2	2	319	2,963
1921	—	—	11	3	—	70	92	—	9	98	75	15	15	—	3	—	128	—	—	24	18	1	3	565	
1922	—	—	32	8	—	126	98	15	11	65	109	25	25	1	8	—	56	—	—	27	16	8	7	637	
1923	13	18	6	—	—	115	73	19	16	64	78	16	23	2	8	3	106	—	—	23	13	9	3	608	
1924	6	15	6	—	—	82	57	8	13	69	125	17	36	4	2	1	82	—	—	19	11	3	1	557	
1925	6	18	2	—	—	94	53	8	18	57	110	9	37	2	3	2	98	—	—	23	10	5	—	555	
1926	9	24	5	—	—	95	45	13	19	76	108	14	33	2	4	1	76	—	—	20	14	1	2	561	
1927	2	15	19	6	—	89	39	6	13	73	121	8	22	2	3	3	72	—	1	9	4	4	3	514	
1928	8	19	16	5	—	73	38	7	13	59	114	11	12	2	1	3	67	—	—	12	3	3	5	471	
1929	29	25	26	7	9	69	37	11	18	46	84	10	14	1	2	5	64	—	—	11	5	4	6	453	
1930	29	15	44	9	23	59	39	12	11	46	76	8	9	1	2	1	48	—	—	6	6	11	4	459	5,410
1931	39	10	18	16	15	68	32	10	12	49	83	6	22	5	3	4	70	—	—	12	13	7	2	496	
1932	27	16	5	15	18	70	45	7	15	38	74	4	29	3	2	3	68	—	4	21	16	21	4	505	
1933	27	9	—	13	9	56	38	3	18	47	86	8	16	3	2	7	86	—	—	14	13	14	2	471	
1934	26	10	—	16	13	78	48	6	15	35	82	7	8	9	1	8	50	—	—	26	25	28	5	496	
1935	27	8	—	18	8	74	43	5	15	18	57	8	19	4	1	3	45	—	—	14	14	19	1	401	
1936	27	3	—	13	12	63	31	20	16	23	68	5	25	6	2	8	47	—	—	10	18	11	2	410	
1937	30	3	—	9	4	61	34	9	13	15	67	5	20	4	—	4	46	—	—	19	19	17	1	380	
1938	25	3	—	10	4	56	51	6	14	22	57	4	28	6	1	2	50	10	—	5	23	14	2	393	
§1939	28	2	—	5	7	52	50	10	24	21	54	7	18	12	4	—	63	19	—	8	6	14	—	404	
Total	324	172	865	287	122	1,592	1,529	175	808	2,270	2,852	299	417	194	69	58	2,968	29	5	872	492	269	259	16,927	

*Prior to 1909 this Course was designated as Option 3 (Electrochemistry) of Course VIII.
†Two received the degree in Naval Architecture, Course XIII-B, in 1916 and three in 1917.
‡Prior to 1923 degrees were awarded in Architecture.
** Prior to 1938 included in Mining Engineering and Metallurgy.
§Includes only June degrees awarded in Class 1939.

TABLE 14

DEGREES OF MASTER OF SCIENCE AWARDED

	Aeronautical Engineering	Architectural Engineering	Architecture	Biol. & P. H. (Inc. VII-A)	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)	Metallurgy	Meteorology	Mining Engineering	Naval Architecture	Naval Construction	Naval Con., Foreign Stud.	Petroleum Engineering	Physics	Railroad Operation	Sanitary Engineering	Without Course Classification	Total
1886									1																				1
1887									1																				1
1888																													—
1889																													—
1890															1														1
1891																													—
1892																													—
1893			1																										1
1894										1																			1
1895			1						1																				1
1896			2						1																				3
1897			2				1																		1				3
1898			1				2											1							1				4
1899			1	1					1																				5
1900																													3
1901			2															2											—
1902			3						3									2											4
1903			5															1									1		8
1904			4						1			2						1					3		1				7
1905			9						1														8				1		12
1906			3						1													2	3						18
1907			6				1																8						9
1908			1						1			3											7						15
1909			6				1		1	2		1				1		1			2		3		1				12
1910			6	1					1	2		1						1					7						19
1911			5	2					2	2		4						2					3						19
1912			4	2					3	3		2									2		4				2		20
1913			4	1			7			1		1			1			2			1		2						22
1914			3	2			3		5	3		2			1			1					2						20
1915	1		4				2		2	1		10	1					4			1	1	2					3	25
1916	5		7	1			1		3	5		6	1					4					2	5				1	29
1917	4		3				1		1	3		5						1			1		9			1		2	41
1918	5		1	1			1		1	1		2						2			1								31
1919	2								3	4		4	1				1	1										1	16
1920				1			3		2	4		7	1			3	1	5			1		19			1			16
1921	3	1					29		6	2		4				2		10					20					4	52
1922	5	1					6	32	4	5		37	1			2	2	4			3		10			1			17	94
1923	10						3	34	1	5		45				2		15	1			4	21			3			18	131
1924	4						6	41	1	5		34	1			1		8	1		1		12			5			26	170
1925	5	1			1		3	35	3	5		35	1					10	2		1					2		1	28	148
1926	6	1					5	20	2	2		60	1		3			6	1				12						21	126
1927	9			1			2	26	4	6		54	2	2		6	1	13			2		6			1			25	144
1928	9						5	14	2	8		63	3	7			2	13					9			1			32	167
1929	5	1					3	21	4	6		79	2	6		4	2	16					6			2		1	43	179
1930	3	4			1		7	22	5	9		51	5	2		1	2	5	3		1	1	5			1		1	45	205
1931	4	3		2	5		15	34	5	12		57	2	4		2	5	10	4	4	2		8			2	3		53	182
1932	5			5	9		25	33	8	17		56	2	5		2	3	16	1	4	1		7			6	6		20	203
1933	10	2		1	5		14	26	7	12		46	2				1	18	2		1	1	13			4	3	2	40	251
1934	7			5	5		16	19	11	9		46				3	3	20	5	1	2		11			3	2	1	20	190
1935	3	2		1	2		16	14	4	13		55	1				3	16	6		1		10			7		2	21	190
1936	5	3			4	2	7	30	3	19		22				2	2	14		4	1	1	7		1	5			21	177
1937	12			1	5	1	12	29	8	17	7	35					1	15	4	4	1		8		1	2		1	23	155
1938	13				8		11	28	1	29	2	58	1				1	24	1	4	1		7		1	3			23	187
*1939	3			2	8		8	16	1	7	3	29				2	1	16	5	5	4		8			2		1	30	223
Total	138	19	84	30	55	3	216	474	115	220	12	916	28	26	1	38	31	280	36	26	31	10	262	5	3	57	14	20	22	143
																													533	3,683

* 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	19	1	3	3
*1939	13	—	5	1
Total	134	11	118	9

* Includes only June degrees.

TABLE 16

Degrees of Doctor of Philosophy Awarded

Year	Biology	Chemistry	Geology	Mathematics	Physics	Total
1907	—	3	—	—	—	3
1908	—	3	—	—	—	3
1909	—	—	—	—	—	—
1910	—	1	1	—	—	2
1911	1	—	—	—	—	1
1912	—	3	3	—	—	6
1913	—	1	—	—	—	1
1914	—	2	—	—	—	2
1915	—	2	—	—	—	2
1916	—	1	1	—	1	3
1917	—	3	1	—	—	4
1918	—	3	1	—	—	4
1919	—	—	—	—	1	1
1920	—	4	1	—	—	5
1921	1	3	—	—	3	7
1922	—	4	1	—	—	5
1923	—	5	1	—	—	6
1924	2	10	—	—	2	14
1925	—	11	—	—	—	11
1926	—	2	2	—	—	4
1927	2	6	1	1	1	11
1928	1	5	1	1	—	8
1929	4	8	2	1	—	15
1930	—	5	2	3	—	10
1931	—	9	—	1	—	10
1932	1	12	—	1	2	16
1933	2	10	3	3	—	18
1934	2	10	2	2	1	17
1935	4	15	2	3	7	31
1936	—	15	—	3	12	30
1937	2	11	4	1	10	28
1938	2	12	2	4	7	27
*1939	1	19	4	2	4	30
Total	25	198	35	26	51	335

* Includes only June degrees.

TABLE 17

Degrees of Doctor of Science Awarded

Year	Aero. Eng.	Ceramics	Chem. Eng.	Chemistry	Civil Eng.	Elec. Eng.	Electrochem. Eng.	Geology	Mathematics	Mech. Eng.	Metallurgy	Meteorology	Min. Eng.	Naval Arch.	Petroleum Eng.	Physics	San. Eng.	Total
1911	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
1912	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1913	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1914	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1915	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
1916	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
1917	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
1918	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1919	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1920	1	—	—	—	—	—	—	1	—	—	—	—	1	—	—	—	—	3
1921	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1922	1	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	3
1923	1	—	—	—	—	—	—	1	—	—	1	—	—	—	—	2	—	5
1924	—	—	2	—	—	1	—	1	—	—	1	—	—	—	—	1	—	6
1925	1	—	3	—	—	—	—	—	—	—	3	—	—	—	—	—	—	7
1926	—	—	1	1	1	1	1	—	—	—	4	—	—	—	—	—	—	9
1927	—	—	—	—	—	1	—	—	1	1	2	—	—	—	—	1	—	6
1928	1	—	5	—	1	2	—	—	—	—	1	—	—	—	—	—	—	10
1929	—	—	3	—	—	—	—	—	—	—	1	—	—	1	—	1	—	6
1930	—	—	9	—	—	6	—	—	1	3	1	—	—	—	—	—	—	20
1931	—	—	3	2	—	3	—	—	—	—	1	—	—	—	—	—	—	9
1932	—	—	5	—	1	2	—	1	—	2	1	—	—	—	—	2	—	14
1933	—	—	10	1	2	3	—	—	1	—	6	—	1	—	—	—	—	24
1934	—	—	3	—	—	2	1	1	—	3	2	1	—	—	—	—	—	13
1935	—	1	2	1	—	4	—	—	2	—	1	1	—	—	—	1	1	14
1936	2	1	12	—	—	1	—	—	—	2	3	—	1	—	—	2	—	24
1937	1	1	9	1	1	6	—	—	—	2	—	—	—	—	1	1	—	23
1938	—	1	12	—	2	7	—	1	—	2	5	3	—	—	—	5	—	38
*1939	1	1	7	—	2	—	—	—	—	—	4	1	—	—	—	2	—	18
Total	10	5	86	7	10	43	2	6	5	15	37	6	3	1	1	18	1	256

* Includes only June degrees.

TABLE 18

DEGREES OF DOCTOR OF PUBLIC HEALTH AWARDED

Year	Number
1924	1
1927	1
1928	1
1930	1
1939	1
Total	5

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 (1868–1939)

Bachelor of Science	16,927
Bachelor in Architecture	134
Bachelor of Architecture in City Planning	11
Master of Science	3,683
Master in Architecture	118
Master in City Planning	9
Doctor of Philosophy	335
Doctor of Science	256
Doctor of Public Health	5
Doctor of Engineering (Discontinued after 1918)	4
Grand Total	21,482

J. C. MACKINNON.

Director of Admissions. During the past year, 1,621 applications were received for admission to the First-Year Class, as compared with 1,535 in 1938. Notices of admission were sent to 765 of these applicants, of whom 606 actually registered on the third day of the term (September 27, 1939), as compared with 668 on the corresponding date in 1938.

In furtherance of the policy of selective admission, a personal conference between each prospective freshman and an officer of the Institute or one of the Honorary Secretaries has been continued as a routine requirement, to be waived

only in exceptional cases. As in previous years, the coöperation of the Honorary Secretaries and other alumni has been indispensable in carrying out this policy. All relevant data on each candidate, including reports of these interviews, are systematically reviewed as a part of the process of selection. Numerous members of the staff in contact with freshmen have remarked that these procedures have brought about a noticeable improvement in the student body.

The Admissions Office has continued to function as an agency of contact as well as selection. During the past three years, some 55 alumni centers in the United States and Canada have been visited in order to inform the alumni of Institute policy in student selection and to enlist their coöperation. Many schools and colleges have been visited incidentally in connection with this program. Beginning in the present year, however, particular emphasis is being placed on close personal contact with the independent secondary schools. Many of these schools send each year to the older universities large delegations of students who go as a matter of course for reasons traceable to inertia or social tradition. Among these are some who have an exceptional bent for science and engineering. Closer relations with these schools will tend to attract such students.

As a part of this general policy, the Country Day School Headmasters' Association has been invited to hold its annual meeting at the Institute in June, 1940. Since one of the strongest influences bearing on the choice of a college is that of teachers, it is desirable that Institute alumni be encouraged to enter secondary school teaching. The Placement Office has taken measures to bring opportunities in this field to the attention of qualified graduates to whom such a career might be congenial. The Technology Awards made annually to schools which have sent outstanding students to the Institute are likewise a significant means of improving school relations. In recent years, the "College Choosing Day" has become a recognized institution in many schools. College representatives are invited to spend a day or an evening at the school to confer with parents and prospective students. These have been attended wherever possible, either by an officer of the Institute or by one of the Honorary Secretaries.

Increasing interest has been shown in the "Coöperative Plan" which now includes eleven colleges of liberal arts. Three undergraduates entered under the plan from these colleges in 1938, while nine were admitted in 1939, coming from Bowdoin, Middlebury, Reed, William and Mary, and Wooster.

Coöperation with the Progressive Education Association has been continued, 13 students being admitted in September, 1939, under the "Eight Year Plan."

B. A. THRESHER.

Chairman of Committee on Summer Session. The registration of students for the Summer Session increased 11.6 per cent over 1938 with the total of 1,581. This is the largest enrollment since 1931. The registration for entrance subjects was practically the same as last year with a total of 138.

In addition to the regular Summer Session subjects and the engineering summer camp, the activities of the Summer Session included several special programs and conferences.

The Department of Physics, for the seventh year, offered an extensive program on Spectroscopy and its applications. The total number registered was 45, distributed as follows: Practical Spectroscopy 23, Spectroscopic Analysis 22. The number enrolled was as many as the laboratory will hold under present conditions.

The Seventh Spectroscopy Conference was held on July 17, 18, and 19. Registration was limited to 200, and 196 reservations were made in advance. More than 50 people arrived without having made reservations, many of them coming from long distances. Because not all persons attended every meeting, the lecture room accommodated the audience fairly comfortably.

A program of 29 papers was presented by spectroscopic experts from the United States and Canada, and in addition one from Germany and one from England. It is becoming apparent that these conferences are considered scientific meetings of unusual interest, and it is taken for granted that they should be held at the Institute. The Technology Press is undertaking the publication of the Proceedings, this being the third set which will have been published. The Proceedings

of the 1937 conference were all sold and enough copies of the Proceedings of the 1938 conference have already been sold to cover the cost of publication, and there is still a marked demand for them.

Thirteen spectroscopists accepted the invitation of the Institute to do research work in the Spectroscopic Laboratory during the summer.

The Department of Metallurgy offered a course in Ceramics. The registered attendance of 29, far in excess of last year, taxed the laboratories to capacity. Several of those attending expressed interest in next year's program.

For the fifth time a course in Theoretical and Applied Colloid Chemistry was offered with a registration of 29, more than double that of the previous year. Here again the laboratories were filled to capacity and it was necessary to increase the staff. All of the men sent here by industries were able to obtain solutions to the problems which they were expected to solve. Dr. A. von Buzagh, Professor of Colloid Chemistry at the Imperial University in Budapest, delivered a series of lectures with demonstrations. Mr. Max Bender of the Manton-Gaulin Manufacturing Company addressed the group on colloid mills and their application in industry. Mr. Sidney Hirshon discussed his recent theories on Gelation and Coagulation. Institute staff members were invited to give lectures in their special fields.

The Department of Architecture in coöperation with the American Planning and Civic Association offered a special program in Planning which attracted professional men, teachers, and students from both the planning and architectural fields. In addition to the courses in Planning Principles, Techniques and Administration given last year, a new course in Planning Legislation was offered and proved to be a valuable addition to the program. In addition to the lectures and seminars, field trips were made to the parks and parkways of metropolitan Boston, the municipal housing projects in Boston and Cambridge, and to the offices of the City and State Planning Boards, and the New England Regional Planning Commission. The geographic distribution of the students was again wide, with the following states represented: Massachusetts, New Hampshire, New York, Texas, Michigan, Missouri, and

Oklahoma. The fact that five of the participants this year were teachers in schools of architecture or engineering indicates that next year special effort should be made to bring the course to the attention of faculty members in other institutions.

A six-week course on Textile Analysis was again given with registration limited only by laboratory capacity. The enrollment consisted of people from industry and from other colleges or textile schools. Teachers from seven educational institutions were registered. One man who is contemplating the establishment, with the coöperation of government agencies and the industry, of special mill and research facilities in Norway took the course. Two students were direct from industry, and one was a government technologist from the Department of Agriculture. It was found that the response to the circular which was sent early to a selected mailing list resulted in the registration of all but two of those in attendance.

Courses in Public Health Bacteriology and General Bacteriology were again offered with increased enrollment in both.

The course in Food Technology enrolled 14 students from such widely separated points as California, Illinois, Ohio, and Newfoundland. The present military crisis prevented the attendance of the Army officers who were expected to take the course.

The second Food Technology Conference, held from June 28 to July 1, was a most successful one and was attended by over 500 persons from more than 30 states and from three foreign countries. Important developments in food technology were presented by leading technical men in the industry. Papers were delivered by 40 specialists in the various fields of food technology. A detailed report of the conference has been published in the August issue of *Food Industries*. At the close of the meeting, steps were taken to form a permanent Institute of Food Technologists to foster the ideals expressed by the two Massachusetts Institute of Technology Food Technology Conferences, thereby facilitating the interchange of technical information on foods and stimulating scientific research in the technological aspects of food production. It was unanimously voted by the large gathering that Dean S. C. Prescott should be the first President of this new organization, an honor both to Dean Prescott and to the Institute.

Two new courses were introduced this summer — one by the Section of Drawing, primarily for secondary school teachers of drawing, and one by the Departments of Mathematics, and Economics and Social Science.

The course in Graphics was attended by nine men, all teachers of drawing. There were three from Massachusetts, one from New York, one from Michigan, and four from Ohio. This course included subjects not ordinarily taught in college freshman work, such as topographical, architectural, structural, and stereoscopic drawing, and graphical mathematics. Outside speakers were invited from time to time. Professor McCully, head of the Department of Engineering Drawing and Descriptive Geometry, Carnegie Institute of Technology, Mr. John W. Wood, Headmaster of Rindge Technical School, Cambridge, Professors Rule and Watts of the Section of Drawing and Professor Douglass of the Mathematics Department gave lectures on the various fields of graphics.

The new course on the Application of Statistics to Quality Control was a result of the Industrial Statistics Conference held here a year ago. It was given jointly by the Departments of Mathematics and Economics and Social Science. The attendance was originally limited to 15, but 21 were finally admitted. Sixteen industries and two educational institutions sent representatives.

Members of the staff who have used the Eastman Lecture Room this summer have expressed appreciation and approval of the newly installed air conditioning system.

In a number of the special courses above mentioned, there have been men enrolled whose primary purpose in coming here was to contact Massachusetts Institute of Technology students who were qualified to carry on special types of research work in their organizations.

The registration at the summer surveying camp was slightly less than last year with an enrollment of 43. Of this number, 36 were regular Institute students; six came from Newark College of Engineering and one from Clarkson College of Technology. It is hoped that these and other schools will make still greater use of our facilities next year.

R. D. DOUGLASS.

The Librarian. This year for the first time the circulation of books lent for one or two weeks' use or longer passed the 100,000 mark, the exact total being 100,996. Reserve books circulated for overnight or week-ends amounted to 30,142. Thus a total of 131,138 volumes were supplied to readers for use outside the Library. Taking the Library as a whole, the one- and two-week circulation increased nearly four per cent, the overnight circulation (which consists largely of reserve books) 20 per cent. Among the registered users of the Library were 836 alumni (Central 574; branches 262).

Net additions to the Library of 8,082 volumes brought the total estimated contents to 340,089. In addition, 205 maps were added (Lindgren 173, Central 32).

The Reference Department borrowed 445 volumes on inter-library loan and lent 1,480; of the latter, 1,086 were borrowed by the libraries of industrial firms and 394 by college, public and other libraries. It handled 3,502 questions requiring search of some kind, and 3,010 telephone calls for service. Sixteen microfilms were obtained for readers from libraries having microfilm service, particularly Harvard College Library, the Library of Congress, and the Department of Agriculture Library; and 112 photostats were obtained from the Institute Photo Service. Other activities of this department included the preparation of three special exhibits: Mechanics in the sixteenth and seventeenth centuries (in connection with the Fifth International Congress for Applied Mechanics), Pioneer Wind Tunnels, and Microphotography. A reading-list for alumni on "National Defense — Its Technology" was distributed in preprint form on Alumni Day, and appeared in the *Technology Review* of July, 1939.

A notable increase in faculty requests for reserve collections, especially in connection with courses in English, history, and general studies, put the resources of the Circulation and Reference departments and Walker Memorial Library to a severe test throughout the year. Reserve collections were set up also in other branches.

Instruction of Freshmen in the use of the Library was repeated along the same lines as last year, with the effective coöperation of the Department of English and History. Although this instruction is of necessity elementary and brief,

good results have been evident in more intelligent use of the Library by Freshmen and Sophomores.

The Catalog Department, long suffering with an inadequate staff, was still further handicapped by being called on constantly to contribute the time of its members to help out other departments of the Library. In the course of the year the equivalent of 27 weeks' work of a full-time assistant was sacrificed in this way. Moreover, a great deal of the department's time was consumed by special demands, such as the transferring of 1,792 books from Central to the branches at the request of faculty members. The re-classification of the Economics and Business classes in the Dewey Library, although carried on with the aid of extra help, claimed no small share of the time of the department staff. This project required changes on 6,113 books and over 27,000 cards, and took 17 weeks.

The Vail Librarian lent from her desk 6,015 books for use in the reading-room, in addition to 9,204 for overnight use, and handled 569 requests for reference assistance. The usual lecture to Sophomores on the use of the Vail Library was given as an integral part of the course, Introduction to Electrical Engineering. The informal round table discussion on values and uses of the Vail Library, conducted with the Junior Honors Group at the peak of their professional enthusiasm, is perhaps the most valuable of all the Vail Library lectures. A list of translation suggestions in electrical engineering literature (German and French) was prepared for the Department of Modern Languages. A revision of the Electrical Engineering thesis list of 1929 is in preparation, and a survey of the periodical holdings of New England libraries in the field of electrical communication has been begun.

The Architectural branch, now named the Arthur Rotch Library of Architecture, brought to its quarters in the new Rogers Building at the beginning of the school year a collection of 10,000 books, 30,000 lantern slides, 50,000 mounted photographs, and a growing collection of miscellaneous material. Credit for the successful layout and decorative charm of the new library is due to the careful foresight and skill of its librarian, Miss Florence W. Stiles, a graduate of Course IV in the Class of 1922. Special provision was made for service to the new option in City Planning. A new development is a small

collection of modern textiles for circulation on the same basis as photographs. The departure of Dean Emerson calls to mind his many gifts and thoughtful deeds for the strengthening of the Library.

The Dewey Library gained notably in service rendered to its five departments. Circulation increased nearly 37 per cent. There was a large reserve book business, the Economics Librarian alone circulating 1,863 reserves. There was constant close coöperation with the research staff of the Industrial Relations Section. The Engineering Librarian prepared, largely on his own time, a Subject List of Theses in Civil and Sanitary Engineering covering the twenty-five years 1913–38, copies of which were sent to all members of the Civil Engineering Department staff.

The Eastman Librarian reports an increase of 4 per cent in circulation, 16 per cent in the number of borrowers, and 20 per cent in attendance, the last-named reaching a total of 36,000 readers. Eastman Library was originally planned for a restricted service to men doing research in pure chemistry, physics and mathematics. Present demands upon it for material in applied fields, by men of other departments and by undergraduates, threaten to alter its character, to complicate its book selection problem, and to crowd its small seating capacity. Serious thought should be given to the lines along which this library is to develop. An author list of the Kayser Collection reprints is in preparation.

The Lindgren Library suffered a severe flood as the result of a break in an overhead water pipe. Several hundred books were damaged and had to be either rebound or replaced. Additional stacks were added and there is no room for more. The desire of department staff members that additional material be brought down from the Central Library cannot be fulfilled unless additional space is provided. The total circulation increased 22 per cent over last year.

Walker Memorial Library, originally planned as a library of recreational reading, has been used more and more as a reservoir of assigned or voluntary reading for courses in English and History and General Studies. This is all to the good, but it is questionable how far the Cilley bequest can legally be drawn upon to supply teaching department needs.

The lack of more than one copy of most books in the Central Library history collection limits its usefulness and naturally accentuates the demand upon Walker. Proposals for a Humanities branch library which would handle these needs, and for greater duplication of books needed in teaching, have been under consideration by the Library Committee; solutions await the provision of adequate space and funds.

The Staff Association held several meetings and among its speakers was Mr. Keyes D. Metcalf, new Director of the Harvard University Libraries. A committee of the Association has undertaken to prepare an outline of requirements as a basis of any preliminary plans for the still-hoped-for new library building.

The Library Committee, consisting this year of Dr. Huntress, chairman, and Professors Lessells, Allis, Roberts, Slichter, Jennison, and the Librarian ex officio, held eleven meetings, and gave intensive consideration both to the Library's immediate problems and to its long-range needs. At two meetings representatives of the teaching departments were present, affording the Committee opportunity to learn departmental opinion concerning the relative adequacy of the Institute Library collections; at another meeting representatives of the Library staff attended, enabling the Committee to obtain the Library point of view regarding handicapping conditions and needed improvements.

A joint meeting with the Visiting Committee was held on February 18, at which the problems of the Library and possible solutions were placed before the Visiting Committee and thoroughly discussed. A visit was paid to the Central Library and discussions continued at luncheon and into the afternoon. The following members of the Visiting Committee were present: Dr. Harlow Shapley, chairman, Dr. Henry B. Van Hoesen, Librarian of Brown University, Mr. Milton E. Lord, Director of the Boston Public Library, Dr. H. W. Craver, Director of the Engineering Societies Library, New York City, and Dr. M. A. DeWolfe Howe of Boston. Dr. Compton was present throughout the day, also Mr. James R. Killian, Jr., Executive Assistant, and Professor John E. Burchard, chairman of the Friends of the Library group.

The most notable outcome of these activities of the Library

Committee was a plan for its reorganization, drawn up by the Committee and adopted by the Faculty April 12, 1939 as a new form of Faculty Rule 21. The text follows:

21. The Committee on the Library shall formulate policies for the administration of the Libraries. It shall consist of two parts: (*A*) an Executive Board, and (*B*) an Advisory Board.

(*A*) The Executive Board shall consist of seven members: two appointed by the President; the Librarian, who shall act as Secretary of the Committee; and four other members elected by the Faculty. The two *appointed* members shall serve for four years, one member being nominated in May of each second year. One of these two members may be an alumnus not necessarily a member of the Faculty. The four members *elected* by the Faculty shall serve four-year terms, one being nominated each year from the Advisory Board described below (in *B*). The Executive Board shall seek the advice of the Advisory Board on matters of policy but shall itself retain voting power. The Chairman of the Library Committee shall be chosen by and from this Executive Board.

(*B*) The Advisory Board of the Library Committee shall consist of one representative from each Institute department, not already represented on the Executive Board, nominated by the head of the department and serving an indefinite term. Vacancies in the Advisory Board arising from any cause (other than by election to the Executive Board) shall be filled by the corresponding department head.

The expected advantages of this re-organization are: closer contact between the Committee and the departments and continuity of policy through longer association with and membership on the Committee; both looking towards more intelligent study of the Library's problems and the promotion of a long-range program for its growth.

The Friends of the Library held no meetings but proved their continuing interest in several ways. In October they presented a library projector for the reading of microfilm, which was used during the year by over thirty readers.

The Friends also conducted a contest for student collectors. First prize, twenty-five dollars, was awarded to L. Charles Hutchinson '37, a graduate student in mathematics; second prize, a Webster's dictionary, to Amos E. Joel, Jr., a third-year student in electrical engineering.

A number of gifts were received through the Friends, notably from Mr. Melville Eastham a set of Purchas's *Hakluytus Posthumus, or, Purchas his Pilgrimes*, in the MacLehose reprint of 1905–07, also funds with which were purchased the

English translations of Nordenskiold's *Fac-simile Atlas* and *Periplus*. The year's activities of the Friends are described at length in their excellent bulletin *Footnotes* No. 2, Spring 1939.

It is a source of regret that in this brief report the many friends — among them thirty-five alumni — who contributed books and journals during the year cannot all be mentioned. It is possible to call attention only to certain outstanding gifts, namely 275 volumes bequeathed by Charles F. Hopewell of the class of 1893; 245 architectural books from the library of Arthur W. Rice, '91, given to the Rotch Library by Mrs. Rice; 238 volumes from the estate of Emeritus Professor Henry Fay, who was an active member of the staff of the Department of Chemistry 1895–1925; 49 volumes in Spanish, principally dealing with the history of Mexico, from the library of George A. Hutchinson, '98, the gift of Miss Alice Hutchinson; 34 volumes on psychology from Mrs. Francis W. Lee; and miscellaneous collections from Mrs. Freeman Hinckley, '10, and Walter F. Hiltner, '35. Donors whose names have not been revealed gave, through Professor Theodore Smith, a fund of $300 for the purchase of books on international relations. Special mention has been made above of the gifts of Mr. Melville Eastham. A small but welcome volume was a copy of Whitehead's "Short account of the life and work of John Joseph Fahie," presented by Sir Robert Rankin and Dr. E. W. Marchant, the former of whom related in correspondence his boyhood recollections of George Edward Dering of Hertfordshire, the original collector of our Vail Collection.

During the past year, as a result of the activity of the Library Committee, more has been said and written than ever before to publicize the library's present difficult situation and its needs. It has been pointed out frequently that the Institute has not hitherto supported the Library in proportion to the volume of demand resulting from the great growth of Institute activities, nor on a scale comparable to the support accorded to university libraries of equal importance. It is therefore becoming clear to an increasing number of those who have the welfare of the Institute at heart that serious thought must be given promptly both to the immediate problems of the Library and to a plan for its future growth. The immediate problems are those of inadequate collections, inadequate space,

and inadequate staff. What goal the Library should seek in its future development is still debatable. Fortunately the steps already taken or in plan by the Library Committee, and the interest shown by the Visiting Committee, the Friends of the Library, and the administration are signs of a unity of understanding and of purpose which hold great encouragement for the future of the Library.

W. N. SEAVER.

Director of Division of Industrial Cooperation. The Division of Industrial Coöperation has handled the usual number of fundamental research problems during the past year. In general, the attack on these problems required collaborative effort and exceptional laboratory facilities and the projects were of a type which the normal commercial laboratory would not be equipped to undertake. Although nearly every Department of the Institute contributed personnel and equipment, the facilities for handling this type of research were by no means taxed.

It is significant that a fair number of long time research projects are still going forward, the results to date having justified their continuance. These include the investigations of stainless steel; studies of the characteristics of lime mortar; and research in the fields of physical metallurgy and ceramics, including some developments in refractories.

Projects which can be mentioned comprise exhaustive studies of design, operation and stress analyses in connection with internal combustion engines. Several investigations have been undertaken in the field of textile engineering while the surface finish of metals and the resulting effects upon friction, wear, corrosion, and lubrication are receiving consideration in the fields of physical metallurgy and mechanical engineering. Other studies, several of which have attracted widespread attention, involved investigations of fuel oils, bentonite films, glass and vitamins.

The Placement Bureau. Alumni Placement. More than 1,400 interviews with alumni and employers were held in the placement office. Nine hundred forty-one requests for men were received from industry. The number of requests for

engineer-trained executives in all branches of industry (financial, sales, production, engineering, research) shows a marked increase over previous years. It has been disappointingly difficult to find enough available men to fill the number of openings referred to us and steps are being taken to enlarge our contacts with qualified alumni.

Undergraduate Placement. There was a marked increase in the number of companies sending representatives to interview the graduating class. June graduates were 65 per cent placed at graduation, distributed as follows: Doctors 86 per cent, Masters 82 per cent, and Bachelors 57 per cent. An incomplete canvass shows an overall placement of 80 per cent early in September.

More men than usual were placed with companies that had either never employed recent graduates or had not employed them during the period for which we have placement statistics. A total of 180 industrial companies employed 306 men. Each of 132 companies took one man. The remaining 48 employed more than one, the maximum figure being 15. Seventy-two men are continuing studies towards advanced degrees. Teaching absorbed 57 men with a strong probability that this figure will be increased considerably.

C. L. NORTON.

Director of Albert Farwell Bemis Foundation. The major work of the year has consisted of a clarification of suggestions for our future program. Many such suggestions had been collected from various authoritative sources and those which seemed valuable were studied in more detail to discover (1) the probable utility of each study; (2) the probability of finding adequate source material for the study; (3) the degree to which the facilities available were promising for such a study. This examination, involving experimental explorations of fragments of various fields, was summarized in a lengthy report made to the Advisory Committee in the spring.

The Advisory Committee constituted during the year consists of Alan C. Bemis; Miles L. Colean, Assistant Administrator, Federal Housing Administration, Washington; Andrew J. Eken, President, Starrett Brothers & Eken, Inc., New York;

O. M. W. Sprague, School of Business Administration, Harvard University; Rufus E. Zimmerman, Vice-President, United States Steel Corporation of Delaware, New York; President Karl T. Compton; Dean E. L. Moreland; Dean W. R. MacCornack; and J. R. Killian, Jr.

As a result of its consideration of the report, a specific program has been laid down for major emphasis for the time being. This program involves an objective study of the economies which result from various specific and actual changes in building techniques. Work will begin in the fall with the addition of two new research assistants.

The Foundation has continued the work of correlating and amplifying our records of efforts in prefabrication and of advancing to contemporary figures many of the more useful housing statistics originally published in 1934 in "The Evolving House," Volume II, and has continued studies of interpretation of the behavior of building materials with particular emphasis this year on synthetic resins, paints and light metals.

The Foundation has been able to answer, with the aid of colleagues in the Institute, a substantial number of questions directed to it by builders, architects, and business organizations. Major preliminary explorations have been carried on with each of three large corporations with a view to developing a possible program of coöperative research. One of these has definitely disappeared as a possibility, the other two are still pending.

On the pedagogical side, the Foundation has supplied a number of lectures in the Materials courses, five on prefabrication and five on resins and light metals; has collaborated with the School of Architecture in a major problem of house design offered in the fifth year; and has been able to act as adviser on a number of theses, principally in the School of Architecture but also extending to two students from Harvard University. Listeners at the prefabrication lectures numbered upwards of 100, and included students from the Schools of Architecture and Business Administration at Harvard, from the Smith College Graduate School of Architecture, and others. We have also worked very intimately with two graduate students in the School of Architecture, William W. Caudill and Lois W. Worley, on their entry in a national competition for Productive

Homes in which it was gratifying that these students won first prize for the region in which they competed. We coöperated with the School of Architecture in bringing Mr. Paul Nelson, of Paris, to lecture at the Institute.

The Director has served on the United States Chamber of Commerce sub-committee on Methods of Construction and Housing Research coöperating with the National Bureau of Standards in the latter's building research program, and as a member of the Modular Service Association, a non-profit organization seeking to develop standard dimensions for building materials through the coöperation of the American Standards Association and others. He has taken an active part from the platform in the deliberations of the Yale-Life Conference on House Building Technics, the New York University symposium on Modern Architecture, the National Association of Real Estate Boards meeting at New Haven, and the meeting of the Society for the Promotion of Engineering Education at State College, Pennsylvania. He has also lectured at Lehigh University, before the Combined Engineering Societies of the Lehigh Valley, and at Carnegie Institute of Technology.

As one of the members of the Interdepartmental Housing Committee, under the chairmanship of Professor Frederick J. Adams, the Director will next year be in administrative charge of the Graduate Seminar in Housing which will be given under the sponsorship of the Committee as a result of this year's deliberations.

JOHN E. BURCHARD.

Secretary of the Society of Arts. The subjects chosen this past year for the Popular Science Lectures illustrated fields of research in which the Institute is making important contributions. These lectures are not only stimulating to the imagination of young people who may be thinking of coming to the Institute, but they also offer the general public an opportunity of becoming acquainted with some of the recent developments of science and its applications.

The lectures were as usual very well attended, requests for tickets being far greater than the seating capacity of the large lecture hall.

The program for the year was as follows:

Friday, December 9; Saturday, December 10; Sunday, December 11
How a Pilot Navigates the Air by Charles S. Draper, Sc.D., Associate Professor of Aeronautical Engineering.

The lecture was illustrated by instruments, experiments, and slides showing how a modern airplane is navigated; the Wright Brothers Wind Tunnel was open for inspection after the lecture and visited by many in the audience.

Friday, January 13; Saturday, January 14; Sunday, January 15
The Approach to the Absolute Zero of Temperature by Frederick G. Keyes, Ph.D., Sc.D., Professor of Chemistry.

In this spectacular lecture, Professor Keyes demonstrated on the lecture table by means of apparatus devised by himself not only the liquification, but the solidification of hydrogen gas. Solid hydrogen has probably nowhere been seen by so many persons as here in Cambridge.

Friday, February 10; Saturday, February 11; Sunday, February 12
Rocks from the Sky, by Frederick K. Morris, Ph.D., Professor of Geology.

Professor Morris, just returned from a trip around the world, illustrated his delightful lecture by a very fine exhibit of meteorites and tectites, many of which he had himself collected in his travels.

Friday, March 10; Saturday, March 11; Sunday, March 12
Living Mechanisms and How the Exact Sciences Measure Their Functions by J. Warren Horton, ScD., Associate Professor of Biological Engineering.

In this lecture the various types of work being developed in the recently established Biological Engineering Laboratory were illustrated. These included methods and techniques of Physics and Electrical Engineering as applied to biological problems.

H. M. GOODWIN.

Chairman of Committee on the Museum. The outstanding addition to the Technology Museum during the year was the Dard Hunter Paper Museum, which was formally opened by a reception and tea on Alumni Day. The collections are complete and definitive in respect to the history and the

technology of handmade paper, and there are in addition exhibits pertaining to the craft of printing. The excellent arrangement of the material is due wholly to the efforts of Dr. Hunter and his son, Dard Hunter, Jr. The number of visitors from the outside has been most gratifying.

The Nautical Museum has received as a loan the large collection of half-models belonging to Professor Owen, most of these being the work of Professor Owen himself. Professor Jack has completed and presented to the Museum a model of a Norse-Icelandic trading ship, of the type used by Leif Ericsson on his voyage to America. This is Professor Jack's sixth model in his series of vessels pertaining to the history of the United States.

The corridor exhibits have been enlarged as follows: The Department of Business and Engineering Administration has a show-case for displays of packaging; the Department of Electrical Engineering has extended its telephone exhibit and its collection of vacuum tubes; the Textile Laboratory has an extensive display, using two show-windows and a multiplex display rack; the Physics Department has added two working exhibits to show the principles of reflection and of refraction; the Structures Laboratory has added two table show-cases for pictures and other flat material; the Chemistry Department has installed new show-cases for examples of glass-blowing and for exhibits of dyes. A diorama of an early nineteenth century pottery has been added to the Ceramics display, and a companion diorama, showing an early New England glass factory, will soon be completed.

Mr. G. A. Mower, of the Class of '81, has presented to the Institute two boat models, one of a Thames River punt and one of a Thames River single scull skiff, and also a model of an English locomotive with the date 1887. Mr. Mower has long been a resident of England, but it is most gratifying to note here that his interest in the Institute has not declined, as his many gifts over a period of several years bear witness. From the estate of Mr. George F. Quinby, of the class of '77, we received a model of a walking-beam engine made by B. F. and G. W. Quinby in Boston in 1858. Mr. John Fisher, Lowell Institute School, '05, presented several old-time electric lamps and sockets. A very old pair of rubbers was presented by Mr.

Alexander G. Meacham. Mrs. William H. Sage has lent a large number of native weapons collected by General William H. Sage during the Philippine Insurrection. The American Cyanamid Company presented a large exhibit of beetle, and the Shuron Optical Company an exhibit showing the manufacture of lenses.

The Committee was assigned the task of arranging exhibits to represent the Institute at the New York World's Fair. The National Cash Register Company offered the use of one of the windows in its building, and through the invaluable coöperation of Professor Edgerton we installed there a fountain playing under stroboscopic effects, along with photomurals depicting the activities of the Institute. Also, for display in the Massachusetts building, we sent a scale model of Professor Trump's X-ray generator that is to be installed in the Massachusetts General Hospital, a radiograph and balloon used in the Institute's meteorological work, the model of the Mayflower built by Professor Jack for the Nautical Museum, specimens showing the research of the Section of Ceramics, and photographs of Institute activities for use in a stereopticon display.

The Committee is expecting to utilize other means of sponsoring Institute exhibits outside of Cambridge. The model of the early New England pottery built in the Hobby Shop for the Ceramics exhibit was sent to Cooper Union for temporary showing. Also, the work of the Soil Mechanics Laboratory was shown, in the stereoscope built for the Mathematics Museum, at the convention of the American Society of Testing Materials in Atlantic City in July.

The Committee is preparing a leaflet, for distribution among visitors to the Institute, locating and describing the various exhibits.

The Visiting Committee for the Museum, formed within the year, held its first meeting in the spring. The many valuable suggestions made at the meeting and the promise of future coöperation will be of great service in the development of our activities.

The Hobby Shop has enjoyed a healthy expansion both in its facilities and in the attendance of students. During the year the group of students that started the shop put into effect an organization to perpetuate a form of student control. Many

students who have had no projects of their own have done considerable work in the construction of museum exhibits.

A. C. WATSON.

Medical Director. The year 1938–1939 has been the busiest one in the history of the Department as evidenced by the number of patients treated. At times during the winter we were forced to place patients in the physical examining rooms, the emergency ward and the solarium.

One hundred twenty-one cases of influenza and 14 cases of pneumonia were treated as bed patients. Only one death occurred during the year. Every pneumonia was of the virulent type but, with the exception of one case, responded well to treatment and the ultimate results were satisfactory.

One case of acute pulmonary hemorrhage occurred at the height of the grippe epidemic and made the situation most critical because of our crowded condition. The large number of bed patients and variety of conditions treated have necessitated a rearrangement of the rooms in order to accomplish better isolation of the contagious cases.

The following table indicates the number of cases treated per month throughout the year:

Outpatient Cases		*Infirmary Cases*	
July	618	July	53
August	586	August	46
September	2,453	September	100
October	3,757	October	166
November	2,022	November	146
December	1,840	December	113
January	1,992	January	135
February	2,300	February	188
March	2,987	March	265
April	2,335	April	147
May	2,087	May	156
June	812	June	82
	23,789		1,597
Total Number Visits			25,386

There were 522 bed cases treated in the Infirmary and the remaining number — 1,075 — were outpatients treated on the Infirmary floor after 5 p.m.

Two thousand two hundred nineteen more cases were treated this year than the previous year.

During the year 24 contagious cases were cared for and properly isolated. One thousand eighty-five complete physical examinations and 1,457 re-examinations were completed. These examinations revealed 638 physical defects which were constantly followed up and corrected as far as possible.

There were 1,097 x-rays of the chest made during this year. These x-rays showed two active cases of tuberculosis — one a member of the student body and the other a member of the instructing staff. The x-rays also revealed the presence of defective chest conditions in 30 students and these men were under continual observation the entire year. Two hundred sixty miscellaneous x-rays were also taken.

The pathological laboratory was extremely busy and there was a marked increase in the number of clinical and pathological examinations, there being 1,304 completed, including Widal, Hinton and Wasserman tests, blood sugar tests, sputum tests for tuberculosis, cultures for diphtheria, etc., smears for malarial parasites, stomach analyses, stool examinations, etc. The pathological laboratory is now located on the second floor, where there is ample room to carry on the work without overcrowding and interruptions.

Two hundred nine patients were referred to outside doctors and 35 to hospitals. The total number of days lost by the student body because of sickness was 2,303.

The chart below gives the average height and weight per class:

Class	*Height*	*Weight*
'42.....	68″	143
'41.....	69″	148
'40.....	69″	153
'39.....	69″	145
Graduates....	68″	148

A very pleasant feature of this year's work was the frequent presence of the patients' parents and their expressions of appreciation for and approval of the care given their sons.

GEORGE W. MORSE, M.D.

Director of News Service. The Institute's press relations have expanded in several directions during the year with an apparent general increase in the publication of science and educational news. The swift and highly organized transmission of news photographs by wire and radio has enlarged the possibilities of illustrating day by day developments and no doubt has been an influential factor in increasing public interest in technological progress.

The News Service made available to newspapers and journals in various fields of interest, as well as to the news departments of the radio systems, 1,871 official news releases, a substantial increase over last year. The subject matter included, in addition to news of scientific and engineering developments, a large number of individual articles on the academic activities and accomplishments of students and members of the staff. There was a notable increase in Institute news appearing in a selected group of influential industrial journals in the various fields covered by our professional departments.

Through direct distribution and by the various national press associations, Institute news reached more than 2,000 newspapers in the United States and a large group of foreign publications, chiefly in England, France, India, South Africa, Australia, and New Zealand. An increase in the national publication of Technology news was noted in the middle western states, as well as in the south and on the Pacific coast.

Published articles from various centers of this country and abroad indicated that during the year more than 1,500,000 words of Institute news was presented to the public.

The News Service also distributed photographs of the Institute's activities in various fields. Through the coöperation of the Photographic Service, the interest and news value of these photographs has been much improved.

The News Service has continued its pleasant association with the Technology Review in the publication of Institute news for the interest of our alumni. More than 50,000 words of this type of news was published.

With the very helpful coöperation of members of the staff, the News Service has continued to give assistance to authors, editors, and special writers in the gathering of authoritative

information on a wide variety of scientific and engineering subjects, a service which is greatly appreciated.

Coöperation with the radio broadcasting systems has increased and, with the assistance of several members of the faculty, it was possible during the past year to present several important programs for national and international transmissions. These ranged from the distribution of regular news bulletins to a series of lectures on special subjects, and a nation-wide broadcast to students of several thousand high schools throughout the country.

The Institute's technical films continue to be of great interest to schools, colleges, and technical organizations.

JOHN J. ROWLANDS.

SCHOOL OF ENGINEERING

Aeronautical Engineering. During the past year the new Wright Brothers Wind Tunnel has occupied the staff in connection with the testing of its equipment, regulation of the air stream, and the development of the necessary instruments for measurement. Power plant, cooling system, compression and evacuation tests have been satisfactorily completed. The degree of turbulence of the wind is satisfactory but adjustments are being made in an effort to improve the velocity distribution. The aerodynamic balance is being calibrated and its precision determined preparatory to undertaking the repetition of certain critical aerodynamic measurements made in other wind tunnels. During the coming year the wind tunnel will start on a research program supported by the Carnegie Corporation and will also be able to do a certain amount of model testing for the airplane industry.

Staff members have made numerous contributions to the literature of Aeronautical Engineering, including two papers read at the 5th International Congress for Applied Mechanics. Research projects, supported by outside agencies, were completed in the field of airplane structures, aerodynamics, instrumentation and engines with publication of the results. Professor R. H. Smith gave vocational guidance lectures in Maine and New Jersey and Professor S. Ober gave a survey of Aeronautical Engineering before the S. P. E. E. meeting in New

York. Professor Hunsaker lectured on Aeronautical Progress before ten chapters of Sigma Xi. Professors C. F. and E. S. Taylor have published their *Internal Combustion Engine*, providing for the first time a suitable text in this subject.

Space requirements continue to limit enrollment, although the growth of the aviation industry in the opinion of the Visiting Committee would justify a moderate increase. The entire top floor of Building 33 has had to be given over to the Meteorology Division due, in part, to the long-range weather forecasting research undertaken in coöperation with the Department of Agriculture. Pressure for space has been further accentuated by a marked increase in the number of students from other courses who elect internal combustion engine design.

The recommendation of last year's report is repeated: that the second floor of Building 33 be extended across the space now housing the old wind tunnel to provide the much needed drafting and class room space.

It would be highly desirable to move all internal combustion engine work out of Building 33 into an extension of the Sloan Automotive Laboratory. This would make possible the expansion of the automotive option in Course II, and at the same time give a closer connection between instruction and laboratory research in this field. Plans for such an extension have been made and are available for execution when funds are available. From the point of view of placement, a larger number of both mechanical and aeronautical engineers should be trained in internal combustion engines, a field in which the Institute occupies a leading position.

The coming year will be marked by Professor Rossby's leave of absence to serve as Assistant Chief of the United States Weather Bureau. Dr. Sverre Petterssen of the Bergen Geophysical Institute has come from Norway to act as his substitute in charge of the Division.

Curriculum changes in Course XVI have been slight except for an expansion of Professor Draper's courses in instrumentation, in response to an increasing demand from graduate students in many fields of research. In the first term he will offer a general course designed to provide the background for the more comprehensive laboratory and lecture courses in the second term.

It has been apparent for some time that our students of superior ability are not entering the Graduate School but are, on graduation, promptly absorbed by industry. On the other hand, some of mediocre ability enter the Graduate School with the justified hope that their employability will be thereby enhanced. Also, whether a student shall undertake graduate study is too often a question of his financial resources.

There is a growing need for engineers for design, research and development work with a higher type of scientific training and a more analytical approach to new problems than can be acquired in the normal four-year engineering course. Frequently, positions requiring such higher training are being filled by graduates of European schools.

The four-year undergraduate curriculum is designed to equip the average good student for useful service as a junior engineer. The professional courses are a superstructure built up from two years of mathematics and physics. This foundation is hardly adequate for advanced work, and a student electing a fifth year of graduate study usually finds it necessary to strengthen his foundations. A standardized five-year program for all engineering students would be unnecessary for the majority, since practical experience in industry is always the best means to acquire the special training needed by the average graduate.

For the student of superior ability, however, a fifth year of advanced studies would be highly desirable, but the standard four-year undergraduate curriculum does not furnish as extensive a scientific foundation as he will need. It therefore appears to be desirable for students of superior ability to be selected before their senior year and to be given special treatment if we and they are to make the most of our educational opportunity.

By vote of the Faculty, the Departments of Aeronautical Engineering and of Mechanical Engineering have been authorized to inaugurate special Honors Courses beginning in 1939–40 for students selected for superior ability. Six such students of the Class of 1940 were selected from Course XVI for whom Professor C. S. Draper will act as tutorial adviser. Each Honors student will follow a senior program designed to suit his own interest and aptitude, but primarily intended to provide a foundation for his fifth year of graduate study for the Master's

degree. He will also be required to spend one summer in suitable industrial employment. Honors students will receive a full scholarship for the graduate year, and as the Loan Fund is also available, it follows that no outstanding student need be barred by lack of funds from the opportunity for graduate study.

J. C. HUNSAKER.

Building Engineering and Construction. The course of study as amended last year has worked out quite satisfactorily and no changes were made during the year.

The first step to coördinate some of the work in the School of Architecture with that in Building Engineering and Construction was taken during the year. A joint problem on the design and construction of a "Faculty Club" was selected for this work. The graduate students in Architecture and the seniors in Building Engineering and Construction studied the architectural and structural design, the details of construction, the services and the economic feasibility of the project. This work was materially aided by the generous coöperation of outside commercial companies and members of the staffs of the Electrical and Mechanical Departments.

This plan will be continued during the coming year. In addition, it is planned to more closely coördinate the efforts of the undergraduate students in the School of Architecture and the second- and third-year students in Building Engineering and Construction by having the architectural students prepare the designs and working sketch plans for use in the courses in Building Construction. In this way the constructors will have an opportunity to see planning in its earlier stages and the architects will be appraised of the point of view of the builder.

Professor Burchard, director of the Bemis Foundation, gave a series of five lectures on "Prefabrication" to the students of Architecture and of Building Engineering and Construction and this work will be continued and expanded as occasion arises.

The Building Materials Research Laboratory was aided by a grant from the National Lime Association. This grant has been renewed for the coming year. The studies on the volume changes in mortars have been completed; a pilot series of tests on the effects of lime on concrete was made and will be studied

further this year; the extrusion-energy machine for testing the workability of mortars has proven its efficiency and the principle of its operation will be extended to a study of concrete; a "weatherometer," or device to expose masonry walls to controlled wind pressures and rainfalls, has been built and will be used to test various types of wall structures.

Professor Voss gave a paper at the regional meeting of the A. S. T. M. in March, and a paper at the Convention of the National Lime Association in June. Mr. H. R. Staley, who has been promoted to the rank of Assistant Professor, gave a paper at the Convention of the National Lime Association in June. Mr. Albert G. Dietz has continued his graduate study on metals and his fundamental study of wood structures. Mr. Donald Whiston will continue his laboratory work under the grant of the National Lime Association.

All of our graduates in the Class of 1939 were placed and with a few exceptions all of our alumni are employed in the field. Coöperative employment for undergraduates during the summer between the third and fourth year was started and two of the juniors are on such work with companies who have signified their willingness to coöperate with us. It is hoped to extend such arrangements so that all of the juniors will have an opportunity for this sort of employment.

Four evening dinner meetings were held, at which members of the staff from other departments and men from outside industrial interests were present and spoke. These meetings will be continued this year, as they stimulate acquaintance and interest among the students and give them an opportunity to meet their instructors and prominent men from the industry.

WALTER C. VOSS.

Business and Engineering Administration. Entrance upon the 25th year of the Course has justified a concentration of attention upon long-term trends and objectives.

Consideration of honors and coöperative plans occupied the attention of the senior members of the department staff in a series of weekly conferences and monthly departmental meetings during the fall term, culminating in a proposal covering a five-year experimental program which has been submitted to the administration for approval.

At the same time an extensive survey was conducted among employers of departmental graduates by the junior department staff members under the chairmanship of Professor Robnett. This investigation also incorporated a series of case studies of graduates, including an analysis of the employment and occupation of past students of the Course. The results of this survey led to a meeting of the Visiting Committee where further plans were developed for a more widespread expression of opinion from all departmental alumni.

Thereupon arrangements were made for an alumni convocation to be held in June. In the several weeks preceding this meeting, five special evening conferences were held with different alumni groups. A considerable body of data was also collected by correspondence reflecting the personal findings and recommendations of Course graduates. These preliminary activities enabled the organization of six formal conferences to which the afternoon of the convocation was devoted. A statement of alumni recommendations was summarized from the minutes of these meetings; presented at the final session of the convocation, and subsequently placed in the hands of all Course graduates and associate members, where it has received ratification.

As the assembly of recommendations from employers and from alumni is considered to be the most noteworthy accomplishment of the departmental year, the remainder of this report will be devoted to these findings.

Interviews with employers disclosed three important trends of attitude:

(1) Employers view with continuing and increasing favor the scientific and engineering training received by our students. The rigorousness of these disciplines is especially commended as well as the widening applicability of the analytic and objective method to the less technical aspects of business.

(2) Employers desire men broadly and yet basically educated in business fundamentals in contrast to men trained in industrial methods or for specific jobs. The latter facilities may be developed within the organization by means of company training programs. The professional approach to administration is, therefore, clearly commended.

(3) Employers reverse the ranking previously given per-

sonal qualities in relation to intellectual ability. Whereas in the past high scholastic standing was given heaviest weighting, it now is viewed as secondary in importance to such personal qualities as adaptability to other personalities, ability to gain coöperation as well as to command respect, willingness to take initiative and to assume responsibility. In a word, employers state that the promotion of the Course XV graduate to major executive responsibilities is dependent primarily upon the kind of man he is and only secondarily upon the extraordinary superiority of his intellect. This outspoken attitude is not interpreted to justify lower scholastic standing. Employers assume that high standards will continue essential to the granting of a Technology diploma. The change in emphasis results from changing conditions in industry where managerial relationships with employees, stockholders, customers and the public are demanding much more of personal qualities than heretofore.

Conversely it is stated with equal vigor that any unsatisfactory experiences with Course graduates almost never resulted from technical, professional or intellectual unfitness but from ineptitudes in human relationships.

Employers uniformly emphasized the difference between those personal qualities conducive to respect and loyalty and those more superficial and adroit. The latter they strongly disfavor. The depression years have forced sterner requirements upon successful management. To maintain the patronage of their customers, demands have increased upon executives. On the other hand, during the same period some collegiate institutions in order to hold their market may unfortunately have been tempted to make life easier and pleasanter for the students. The young man of superficial social characteristics is therefore regarded in industry with increasing hesitancy.

Ensuing conferences with the alumni group prior to and during the convocation revealed similar attitudes, the more important of which follow:

(*a*) The undergraduate course of study is held to be soundly based upon science and engineering and should remain so with no lessening of emphasis. The superstructure of economic and business subjects is deemed satisfactory. But upon these foundations there should be constructed a further service to our students,— a greater awareness of the problems

of human relationships. This need centers chiefly in the years of transition from Technology to industry. The alumni maintain that the Course graduate is trained adequately in the solution of industrial problems but is less facile in the gaining of the coöperation and support necessary to transform the solution into concrete results.

In attaining these ends the principle of learning by doing should be applied, though the place may not be the laboratory or the classroom, but the factory, the fraternity house, the committee room, the dormitory and the professor's study. Specific recommendations for the earlier years included summer employment at bench and machine, early introduction of industrial subjects, widening of interest in broader human concepts found in the social sciences and encouragement in extra-curricular campus activities. In the upper years the alumni urged closer relationships with business executives. Plant visitations, afternoon and evening meetings, were commended. Continuance of summer contacts and the use of thesis and written reports as agencies for further close acquaintanceship were stressed.

Wider human understanding was explicitly recommended in relation to distribution. Management problems should not be confined to the factory or the retail selling floor where understanding of the ultimate consumer himself is demanded. Alumni also would have graduates more generously aware of the practical problems confronting those who are engaged in the work of government. Understanding here is doubly difficult in the face of political predilection.

(*b*) Facility in the use of the spoken word was given heavy emphasis culminating in the alumni specification that intensive training in oral expression be required. To learn by doing was held to be the surest road to acquirement of verbal skill. Alumni insist that sound ideas are entitled to clear presentation; that to obtain for a new proposal the receptive hearing which it deserves is an inseparable responsibility.

(*c*) The student-teacher relationship was considered to be of profound significance in furthering the above objectives. Personal qualities are best bestirred through example. Humanness is reflected from humanness. Coöperation springs from its anticipation and anticipation springs from past experience.

When professors have been coöperative, students will respond to coöperation from executives and workmen.

Needless to say these expressions of attitude, opinions and convictions from employers and alumni require further consideration to determine practical means by which desired ends may be attained. The department wishes to express its gratitude to the many individuals who contributed of their time and thought to the end that these opportunities for added service to our students could be defined and their value outlined.

ERWIN H. SCHELL.

Chemical Engineering. Student demand for training in Chemical Engineering continues to grow, and constitutes a major problem of this department. The undergraduate trend is indicated by the selection of the Chemical Engineering course by nearly one-quarter of this year's freshman class, as contrasted with an estimated department capacity based on staff and facilities for only half this number. The Institute's Course Stabilization program is therefore proving an essential control for maintaining quality of professional undergraduate instruction. Applications for the Graduate School show the same tendency and have required that much care be given to the selection of candidates in an attempt to admit the most promising men and to keep within the quota of 130.

The department's Visiting Committee reviewed this situation and concluded that the present trends should be expected to continue. They advised that consideration be given to the construction of a new building to house the integrated activities of this department and to allow a moderate expansion of capacity for instruction and research. The Committee felt that pending such a move the present restrictions on enrollment should be maintained. The explanation of the movement of students toward this field apparently lies not only in the demand for strictly professional training but also in a growing belief that a Chemical Engineering course offers a satisfactorily broad preparation for a career of less technical nature in modern industry.

The rearrangement in sequence of undergraduate subjects of instruction reported two years ago is giving satisfactory

results, both in equalizing student load between Junior and Senior years and in securing the advantages of greater maturity and background on the part of the student in the subjects transferred to the fourth year. Definite progress was made during the year in the development of a more adequate program of graduate instruction in the field of Applied Chemistry, involving the introduction of laboratory instruction (still in an experimental stage) and the broadening in scope of classroom courses.

Publications on research have shown a gratifying increase, and three new books by staff members have appeared. General research activity has expanded, notably in the prosecution of new work on Solar Energy, in growth of the program in Colloid Chemistry and in the inception of research in Electrochemistry.

The School of Chemical Engineering Practice has had another year of successful operation at maximum capacity. This was the first full year at the new Parlin Station at Hercules Powder Company and the School has benefited by helpful company interest and coöperation in its technical problems. Many of the activities are along lines which are of direct significance to the plant: for example, student work on the disposal of acid wastes has led to promising developments which are being furthered by the plant organization.

Research on heat transfer has been extended to cover transmission into tubes through which a mixture of liquid and vapor is being forced; a condition frequently encountered in boilers, stills and heaters.

Work on the fundamentals of radiant heat transmission has been continued by extending and simplifying the problem of radiant heat transfer among surfaces forming an enclosure, and by an experimental study of radiation from ammonia vapor. In the program on fuel oil combustion, quantitative studies of atomization in liquids have indicated a general law of particle size distribution which should prove helpful in putting various reactions in a so-called "atomized cloud," such as combustion of oil, spray drying and spray absorption, on a more quantitative basis.

In connection with the Institute's program on the utilization of Solar Radiation, a project in this department is the

direct conversion of sunlight to heat for use in house heating, summer air conditioning by absorption refrigeration, and power generation. A building is under construction where such studies can be made and correlated with pyrheliometric records. To aid this program a government pyrheliometric substation has been established at the Institute.

The second fundamental investigation of eddy diffusion was completed and published during the year. These investigations have emphasized the applicability of the newer concepts in fluid dynamics to the chemical engineering operations of gas absorption, drying, and vaporization.

An experimental study of solvent extraction in towers packed with standard rings and saddles was completed and published. This field of research is of growing interest as methods of separation by solvent extraction gain headway in industry.

With the help of the research assistant plan, the first part of a broad program of research on gas absorption has been finished. A large amount of data, suitable for design purposes, has been obtained on the operation of standard absorption-tower packings used under conditions where liquid film is controlling. The value of the results was enhanced by the work of a number of associated masters' theses carried out under the immediate supervision of the research assistant in question.

Continuation of the work on volatile metallic chlorides has directed particular study to the recovery of titanium and titanium dioxide. The work on Beryllium has progressed to the stage where primary attention is being directed to recovering the metal from the chloride.

A new research on the properties and manufacture of high phosphorus glasses was initiated. Many of these phosphorus glasses show unusual properties, such as great chemical inertness and very low viscosity when in a molten state. A few of the first samples were given to the Physics Department for x-ray and other analysis. In the study of these glasses special attention is being directed to evaluating and developing suitable electrical characteristics.

A correlation of the effect of pressure on internal energy for many of the industrially important vapors for which

reliable data are available has been developed and will shortly be published.

A vital preliminary to the utilization of cracked gases produced in petroleum refineries for the synthesis of commercial products is the process of concentrating the olefins in these gases. Work along this line has dealt with three possible methods of concentration: high pressure fractionation, use of chemical absorbents and use of rubber diaphragms.

For the first, special apparatus has been developed to study vapor-liquid equilibria at high pressure and the enthalpy effects involved. New data have been secured on several different systems, which have enabled the development of a more significant method for correlating the results.

In the second, chemical absorbents, studies of cuprous salt solutions and of solid cuprous salts have indicated that these materials are excellent media for separating olefins from paraffins. Continuous operation in a tower of pilot-plant scale has shown that ethylene can easily be concentrated by cuprous salt solutions. Likewise, it has been found possible to separate butadiene from mono-olefins and saturated compounds. The latter work is of particular importance in the production of synthetic rubber from butadiene. Vapor-phase cracking of petroleum gives a cut containing from 20 to 50 per cent butadiene and rough estimates indicate some 500,000 pounds of butadiene are available at present in the cuts now produced. This quantity of butadiene, which could readily be produced, would make synthetic rubber equivalent to about 20 per cent of the United States requirements.

In connection with the third method, it has been found that rubber diaphragms may be used to separate the lower hydrocarbons. Olefins pass through the diaphragms much faster than the corresponding saturated compounds. It has also been found possible to separate saturated compounds of the same number of carbon atoms; thus n-butane was found to pass through a particular rubber diaphragm about five times as fast as isobutane.

Utilization of the lower petroleum hydrocarbons has been carried out in the following fields: hydration of olefins to alcohols and ethers, oxidation of hydrocarbons and polymerization of olefins to materials of high molecular weight.

Work was initiated on improving the process of purifying clays by electrodialysis which results from continuous flow of acid from cathode to anode. Direct electrodialysis is accompanied by such wide variations in electrical resistance that control of voltage and current is difficult and a satisfactory technique of continuous operation is almost impossible. It has already been demonstrated that properly controlled addition of acid can almost completely eliminate this difficulty and at the same time secure much more rapid purification at a relatively small increase in power consumption.

Study of the colloid chemistry of clays in general and of bentonite specifically has been continued. The development of "Alsifilm," the coherent, self-supporting film made from bentonite, has naturally taken first place in this program. Grants by the Research Corporation, to whom the Institute has assigned the patent rights, have promoted such work. A satisfactory insight into the structure of "Alsifilm" has resulted and this has permitted working out methods of making "Alsifilm" waterproof as well as flexible and materially improving the electrical insulating properties of this new product. Other research on clays has noticeably benefited from this work, and knowledge of the structure of clay and of it reactivity has been advanced.

The continuing research on the gelation and coagulation of colloidal systems resulted this year in a new and very promising theory of gelation and coagulation which apparently coördinates many experimental data.

Work on rubber vulcanization was extended by approaching the subject from new angles, such as the vulcanization of rubber under stretch and vulcanization in inert atmospheres. The results have materially enlarged our knowledge of the mechanism of vulcanization and of the structure of vulcanized rubber.

Surface tension research with the pendant drop method has continued, and valuable information on surface or interfacial tension changes with time and under varying atmospheres have been recorded. This work is part of an extensive program which will be actively prosecuted as soon as the new pendant drop apparatus is available.

A number of instruments which are important to research

and to the training of students in the field of applied colloid chemistry have been added, thereby increasing the effectiveness of laboratory courses in colloid chemistry and of lecture demonstrations.

One of the staff conducted a three-day symposium in Oklahoma on colloid chemistry in the petroleum industry early in March at the invitation of the University of Oklahoma. This symposium aroused interest among oil men of the southwest and brought a number of registrations from that section of the country for the summer course in colloid chemistry. This summer course, given for the fourth consecutive year, showed a record registration.

A start has been made this year towards research in the field of electrochemistry, and one new staff member has devoted his whole time to this field and the related one of corrosion. Preliminary results are promising, although several years will presumably be required to establish fully this new phase of activity.

WALTER G. WHITMAN.

Civil and Sanitary Engineering. Developments during the past year in the Department of Civil and Sanitary Engineering have been characterized by research work in various fields and by the application of research facilities to the educational program of the department.

In the Seismology Laboratory, Professor Ruge has continued his studies with electrical strain gages. This new type of gage is not only extremely sensitive, but may be placed in locations which are impractical for other types of strain gage devices. These gages were used in an investigation of shell stresses in elevated tanks supported on columns, models of which were subjected to dynamic loadings.

A speed governor has been developed for use on recording drums where precise drum speed is essential. A special low-power unit has been completed for use in seismograph stations which depend upon storage batteries for power.

Apparatus has been completed for analysis of earthquake motions by means of a photocell-controlled galvanometer which records the response of simple structures to earthquake motions.

This project is being carried out in coöperation with the United States Coast and Geodetic Survey.

Research in the Soil Mechanics Laboratory under the supervision of Professor Taylor had, as its most important aspect, further studies dealing with the consolidation of clays and the shearing strength of sands. The results of special studies of the effects of secondary compression were incorporated into the consolidation theory, producing better agreement between theory and laboratory tests. Comparative studies of the shearing strength of sand by direct shear tests and by compression tests on sand cylinders were proven to be consistent with each other. For the cylindrical compression tests a new apparatus, designed by Mr. Fidler, was built which gives very consistent results.

The research projects carried on in the Laboratory of Structural Analysis under the direction of Professor Wilbur included an experimental investigation of the elastic buckling of struts. The action of structural members stressed beyond their elastic limit was also studied experimentally. The distribution of stresses between the various rivets of a group was investigated by photoelastic methods and also by direct strain measurements.

Under Professor Reynolds, the River Hydraulic Laboratory has made progress in an extended investigation of flow through open channels. Relations between various degrees of roughness and velocity of flow, depth of flow and water temperature have been studied; the effect of roughness on transition regions from parallel-line to turbulent flow has also been considered.

In the Sanitary Engineering Laboratory, the effect of temperature and concentration of chemicals upon the formation of floc, and of orifices upon the destruction of floc particles have been studied. Experimental studies were made to determine the model law for use in obtaining similar flow patterns in mixing chambers. The theory of clarification by filtration through sand and the effect of grain shape upon the flow of clean water through clean sand were also investigated. Professor Camp was in charge of this work.

Laboratory facilities for cement and concrete research have been expanded. Coöperative projects in this field have

been undertaken with several commercial firms. A new and promising method of measuring the resistance of concrete to cracking has been an important accomplishment. Professor Carlson was the recipient of the Charles B. Dudley Medal which was awarded by the American Society for Testing Materials, for his paper: "Drying Shrinkage of Concrete as Affected by Many Factors."

A graduate course dealing with the analysis of stresses in structures by means of model studies was offered for the first time during the year, with experimental work conducted in the Laboratory of Structural Analysis.

A new course in Aerial Surveying was given by the Surveying Division. A modification of our course in Hydrology is being made, in which Hydrology and Meteorology will be correlated. Emphasis will be placed on long-time predictions as to flood flow.

As in the past, members of this department have been associated with engineering enterprises of both public and private nature. Professor Breed is serving the Commonwealth of Massachusetts as consultant in connection with the proposed abandonment of passenger service on the Old Colony Railroad. Professor Spofford was consultant to the Department of Public Works of the Commonwealth of Massachusetts and to several cities on structural problems, and was connected with various other structural projects. Professor Camp has acted as consultant to the City of Dover, New Hampshire, and to the City of Chelsea, Massachusetts, on sanitary and hydraulic problems. Professor Carlson has been consultant on the Mahoning Dam, the Hiwassee Dam, the Claytor Dam and the Ross Dam.

Several members of this department have contributed their services in the engineering aspects of the program for new athletic facilities at the Institute. In the River Hydraulic Laboratory, Dr. Reynolds carried on a model investigation of the proposed swimming pool for the gymnasium. This involved studying methods for quieting wave action in the pool and the proper design and location of inlets and outlets. Professor Camp, who coöperated in this latter phase, also designed the sanitary features of the pool. Professor Wilbur made the structural design for the main flocculation tank. Mr. Shea rendered professional assistance in laying out a new crew course

and in checking the length of the new track adjacent to Briggs Field House.

The policy adopted last year of permitting outstanding students in Civil Engineering from other colleges to attend the Summer Surveying Camp at East Machias, Maine, at the reduced rate which now applies to our own students, was repeated this year with continued success. An aerial survey of the camp and of the surrounding territory was correlated with ground surveying, providing new interest to the work.

An 18-inch precise tilting dumpy level was presented to the department by Louis H. and William A. Berger. The gift was made in memory of the late Professor G. L. Hosmer. A copy of the book, "Old Bridges of France," was presented to the department by one of its authors, Professor William Emerson. Mr. John B. Holmberg of the Holmberg Aerial Survey Company made an aerial survey of our Summer Surveying Camp at East Machias and presented the results as a gift to the Institute.

CHARLES B. BREED.

Electrical Engineering. During the past year the work of the Department of Electrical Engineering has shown continued development, primarily along previously designated lines but with certain important new lines appearing. For convenience in description, the instruction and research aspects of this work are distinguished, though both in guiding thought and in actual operation the two are closely interwoven and mutually helpful aspects of one educational program.

In the development of undergraduate instruction the curriculum-revision project involving the Basic Principles of Electrical Engineering series has been a major activity for several years. Most members of the staff have contributed to the planographed notes for this series which include many new ideas and methods of presentation built around the thought that the growing electrical field requires training both broader in its concept and more fundamental in its foundations than previously. Responsibility for the consolidation of these notes into a five-volume series has now been centered in a group of five-volume-editors, and publication of the first volume is expected in January 1940.

Because of continued conviction that the Honors Group plan, as at present conceived, produces valuable results, attention is being directed to the more effective application of the methods of instruction now used with the groups. A broad preliminary proposal for this purpose was presented to the Visiting Committee. One important offshoot of the Honors Group plan is the project-type of laboratory program now used by practically all electrical students in the department laboratories. This program is proving increasingly effective in stimulating serious independent thought in students.

In the Coöperative Courses, full works schedules were in effect during the spring and summer of 1939, though restricted schedules obtained earlier. Notable is the fact that over the depression years about 40 per cent of the full schedule of coöperative work was maintained.

The modified sophomore orientation program including elementary laboratory work, described in last year's report, proved successful and is being continued with minor changes.

Among student honors is the Rhodes Scholarship awarded to Vernon Lippitt, Course VI-A, 1939. In the Stratton Prize Contest, electrical engineering students took second and third prizes this year, perhaps reflecting the increasing emphasis being given in the department to effective expression in both oral and written English.

A particularly active group of students this year secured the installation in the department on April 15, 1939, of a Chapter of Eta Kappa Nu, national honorary electrical engineering fraternity whose purpose is to aid its members in becoming better men in their profession and as citizens. Careful investigation prior to approving the formation of this Chapter indicated the likelihood of its continued vitality.

In graduate work several points are worth mention. The demand for men with advanced degrees this year exceeded the number available, indicating the value placed on such training by industry. Graduate subjects offered for the first time this year included: Radio Lines, Antennas and Propagation by Professor W. L. Barrow; Patents and their Relation to Science and Engineering by Professor E. L. Bowles; and Engineering Applications of Static Field Theory by Professor P. Moon, all of which attracted substantial numbers of students. Next

year, work on the principles of automatic control by Professor G. S. Brown promises to be of widespread interest. This will be part of a program specially set up by the department for a group of experienced graduate United States Naval Officers.

The past year has been one of marked research activity in the department. While sponsored largely by outside funds, the researches are practically all on a non-confidential basis and have contributed to the educational program both directly and indirectly. Space permits mention of only a few high points.

The Instrument Landing Research for the Civil Aeronautics Authority has been carried to a successful conclusion. In it the applicability of the Barrow horn radiators for producing radio beams and the first application of centimeter waves to the problem have been demonstrated. Ingenious adaptation of the aeroplane gyro by Professor Hall simplified the instrument aspect of the problem. The first application of the Stanford new ultrahigh-frequency generator, the Klystron, was made here in this research through the courtesy of Stanford University, the Sperry Gyroscope Company and the United States Army. This project has, in fact, shown the benefit derivable from coöperation between departments within the Institute, and between the Institute and industry, and the Army.

As a result of its advantageous position in the ultrahigh-frequency field and the outstanding importance of the subject, the department, through a grant from the Executive Committee is now to develop an ultrahigh-frequency laboratory. The department is also fortunate to be enabled to collaborate with the Loomis Laboratory at Tuxedo Park and with Professor Stratton of the Department of Physics in a research on the propagation of ultrahigh-frequency waves, and to undertake two other researches in the ultrahigh-frequency field, one sponsored by the International Telephone and Telegraph Company and the other by the Sperry Gyroscope Company. Both this and the related Instrument Landing Research are directed by Professor Bowles.

During the past year the original Differential Analyzer was used for problems in a number of widely scattered fields by Institute Staff and students, and by persons from two other institutions and from a commercial organization.

The new Differential Analyzer, developed and built during the past three years with the support of the Rockefeller Foundation, is now scheduled for completion about December 1, 1939, all major designs having been completed, and all critical components tested in experimental form by July 1939.

Recently the Carnegie Corporation granted to the Institute the sum of $45,000 for the establishment, and support for a two-year period, of a Center of Analysis whose program contemplates making the Institute's advanced mechanical facilities for analysis and computation, including a skilled operating personnel, available to scientific workers without regard to institutional connection. Professor S. H. Caldwell will direct the Center.

Support received through the Research Corporation has accelerated the development of the function-generating unit, originally planned as a part of the new Differential Analyzer. An experimental unit is now in production. Similarly supported is the development of an extremely rapid numerical computing machine.

The development of the Rapid Library Selector, originated by Dr. Bush, was started last summer with the coöperation, through the Research Corporation, of the Eastman Kodak Company and the National Cash Register Company. The critical phases of this development are nearing completion and assembly of a working model is expected soon. Mr. John H. Howard is in immediate charge of this project.

A major extension of the department's high-voltage X-ray development for medical use is again supported by the Godfrey M. Hyams Trust through a grant to the Institute for the construction of a three-million-volt X-ray and cathode-ray generator and suitable housing for it on Institute property. The initial one-million-volt X-ray unit has been in continuous use for cancer therapy at the Huntington Memorial Hospital in Boston for over two years, while a second, pressure-insulated unit, operating up to 1.5 million volts is being used here for X-ray and cathode-ray studies pending its installation in the George Robert White Memorial building now under construction at the Massachusetts General Hospital. Professor Trump is in charge of this development, Professor Van de Graaff, of the Department of Physics, collaborating.

Important scientific contributions continue from the electrical insulating oil research directed by Professor Balsbaugh and sponsored by the Utilities Coördinated Research, Inc. of the Association of Edison Illiuminating Companies. On September 1, 1939, support of this research was taken over by the Engineering Foundation, with supervision by the Committee on Research of the American Institute of Electrical Engineers, the funds being supplied by groups of utility, oil and electrical manufacturing companies, the Engineering Foundation and the A. I. E. E.

Activity in the Insulation Laboratory directed by Professor A. von Hippel included development of equipment; research on gaseous, liquid, and solid insulators, and semiconductors; and studies on the blocking layer photo-effect in collaboration with the Solar Energy Committee. This laboratory will also carry on the portion of the ultrahigh-frequency research program pertaining to properties of dielectric materials.

A comprehensive group of papers published this year together with additional papers now in preparation constitute a major contribution to the knowledge of fog — its physical properties and their measurement, its dissipation and its action on radiation in the visible and near-visible spectrum — as the results of the extended Round Hill Fog Research program under the direction of Professor Bowles.

Under Professor Edgerton's leadership stroboscopic light sources and photography have been further improved in apparatus and technique, and numerous important applications developed. Such equipment was applied this year, for example, to the Bush Library Selector; to the Pelton wheel and the propeller tunnel in the Mechanical Engineering Laboratory; to two exhibits at the World's Fair in New York; and to the study of muscle-fiber contraction and of fractures of glass, both using polarized light.

Numerous other research activities achieved significant results of which only a few are mentioned. The Cinema Integraph was further developed and applied to the solution of a number of significant problems. Methods for measuring the attenuation of sound in ducts and pipes with high precision have been developed and applied. The high-frequency research in coöperation with the General Radio Company has yielded

useful laboratory power sources and has advanced the technique of measurements in the frequency range involved. The Network Analyzer was in use a major portion of the time for student instruction and research, and for commercial problems. Professor Moon has published results of a number of illumination researches. Mr. John L. C. Löf received the national prize award of the A. I. E. E. for a student-branch paper. The Staff Colloquia in which various research activities are described showed continued interest in its second year.

A new method of treating reprints of periodical publications originating in the department was inaugurated, in which a Research Publications Bulletin is sent out periodically, listing with a semi-technical 100-word abstract, all recent publications and Doctors' theses. Reprints of papers are available upon request. Opinions thus far received indicate that this procedure gives more useful information on the department's extensive research activity than the previous scheme of sending out only selected bound reprints.

HAROLD L. HAZEN.

Mechanical Engineering. With extensive naval ship building combined with the program of the Maritime Commission for building some 500 merchant ships in the next ten years, an acute shortage of marine engineers in this country has become evident. The Institute has long enjoyed close relations with the Navy Yard at Charlestown, the Bethlehem Shipbuilding Company at Quincy, and the turbine and gear works of the General Electric Company at Lynn. On our faculty there are several men experienced in the problems of Marine Engineering.

At the request of the Navy, the Department of Naval Architecture and Marine Engineering and the Department of Mechanical Engineering have organized a special one-year graduate course in Marine Engineering, to begin in 1939–40.

Beginning with the Class of 1940, a special Honors Course has been inaugurated for students of superior ability. An initial group of eight students was selected from Course II juniors for whom Professor Keenan will act as tutorial adviser. Each Honors student will follow a senior program of studies,

designed to suit his own interest and aptitude but primarily intended to provide a broader foundation for a fifth year of graduate study for the Master's degree. Honors students will receive a full scholarship for the graduate year and will be required to spend one summer in suitable industrial employment.

The reasons for inaugurating this special treatment for students of superior ability have been discussed previously in the report from the Department of Aeronautical Engineering, where the same plan has been put into effect.

Aside from the inauguration of the Honors Course, the regular undergraduate curriculum has not been changed to any important extent. Course II-A, in coöperation with the General Electric Company, is working satisfactorily but the numbers selected this year have been sharply reduced in order to facilitate assignment to industrial work regardless of the employment situation. This sort of coöperative course can only be successful when the program can be followed without interruption.

Attention has been devoted to reorganization of the second-year Machine Drawing. Primary emphasis has been shifted from training in routine drafting technique to utilization of Machine Drawing as a transitional medium between first-year drawing, and Machine Design of the third and fourth years. The objective is to show machine detailing as the connecting link between original design and production. Through the coöperation of manufacturers of small machinery, who have loaned both design and production drawings, as well as small machines, problems typifying current industrial practices have been introduced.

The senior option, designated Materials and Design, has been improved by additions to Dr. Murray's photoelastic and fatigue testing apparatus from funds collected for industrial testing under a scheme brought into effect two years ago. In class exercises the new apparatus will enable two-dimensional photoelastic problems under dynamic conditions to be studied and the fatigue equipment, when completed, will provide means for studying mass and form effects.

The research on the effects of combined stress on the strength of metals undertaken by Professors Lessells and

MacGregor has made progress. Preliminary results have been published during the year and will be reflected in the undergraduate work connected with Testing Materials.

New equipment for studying foundry sands has been acquired to extend the scope of research in connection with foundry problems. A meeting of the New England Foundrymen's Association was again held in April under the department's sponsorship, devoted as before to a discussion of foundry materials and processes.

The Air Conditioning Laboratory has received as gifts during the past year a Freon compressor for use with one of our present cooling units and four fin tube cooling coils for thesis work. New equipment is being assembled to meet the increasing demand for thesis work in this field. Coöperation with other departments on various air conditioning problems has continued.

The Machine Tool Laboratory has had an especially busy year with registration so heavy that extra sections had to be provided. New courses to meet the needs of experimental physicists and marine engineers have been added. There has been an unusual amount of thesis apparatus constructed in the laboratory during the past term. As many as 25 men at a time have been using machinery and equipment.

Research projects carried out by Professor MacGregor in the field of plastic flow include the following: Stress-Reduction in Area Experiments on Notched and Tapered Specimens; Direct Verification of Assumptions in Plastic Torsion Theory; Stress-Reduction in Area Relations Determined from Creep Tests on Lead; Design of a Testing Machine for the Plastiscope. In addition, a special type of tube furnace with temperature controls was constructed for the study of the relaxation of stresses in various fitted connections when subjected to high temperature.

Additional combined stress tests have been made in which tubes were subjected to combined axial load and internal pressure. A new hydraulic lateral extensometer was constructed and successfully used in these tests.

Professor Keenan's work on the performance of metering nozzles in terms of the Reynolds Number and the degree of compressibility has been extended to the sharp-edged orifice.

The discharge coefficient of such an orifice was determined with steam over a moderate range of turbulent conditions and over a wide range of compressibility. The flow of metastable liquid water has been observed over a range of pressures in an exploratory undergraduate thesis, and the way is now prepared for a more careful investigation. Preliminary work has also been done on the measurement of friction coefficients in flow at velocities above the velocity of sound.

The Heat Measurements Laboratory moved into its new quarters in the fall and much of the year was devoted to installation of equipment, with research, consequently, nearly at a standstill. The main improvements include means for calibration of temperature measuring devices, the latest type of optical pyrometer, a new low-temperature room with automatic control, and improved high-temperature furnace facilities. The better facilities and more convenient location is reflected in the increased use of the laboratory by students not taking regular courses. For the fifth consecutive year there has been a material increase in the number of students attending regular courses.

Professor Buckingham has recently completed an analysis of the influence of elasticity and errors on the strength of screw threads, which indicates that errors in lead may be very detrimental. The A. S. M. E. Committee for the Standardization of Screw Threads has requested a series of tests on bolts and nuts to obtain quantitative experimental data to check this analysis and to form a basis for the revision of the present standard. Companies represented on this committee will supply funds for special testing equipment.

An unusually large number of students registered for the automotive courses this year. Class room, drafting room and laboratory facilities were overcrowded, and it is hoped that better accommodations can be provided in the near future. The first phase of the research for the National Advisory Committee for Aeronautics on "The Charging Process in a Two-Stroke Cylinder" was completed and a report published. A report was also published by the N. A. C. A. covering our work of the past two years on the fundamentals of the charging process in a four-stroke cylinder. The work on alcohol-gasoline blends, financed by the Chemical Foundation, was completed.

A high-speed, eddy-current brake was completed during the year. This adds a piece of apparatus that is very useful in testing small high-speed engines.

An important project has been undertaken in the Sloan Automotive Laboratory for the Wright Aeronautical Corporation on the efficiency of aircraft engines, which is expected to continue into next year. Another new project, started this year for the N. A. C. A., is a fundamental study of factors controlling detonation. A report on the second phase of the two-stroke engine research for the N. A. C. A. is in process of preparation. These projects, together with the usual number of student theses and several projects for the Division of Industrial Coöperation, kept the laboratory staff and facilities operating to full capacity.

Rearrangement of the Textile Laboratories under Professor Schwarz, incident to the construction of the new Rogers Building, is complete and, with the addition of specially designed equipment, our facilities for fundamental research in textile technology are unusually good. Important work in the field of plastic and elastic properties of textile fibres has been undertaken under the auspices of the Textile Foundation together with a basic study of the measurement of molecular orientation of textile fibres and its relationship to their physical properties. The latter work is being undertaken by means of an optical approach through the measurement, by greatly improved methods, of the specific indices of birefringence of fibres both normal and after known treatments.

The American Association of Textile Chemists and Colorists has instituted a long-term program of research on the measurement of the "handle" of fabrics (flexural rigidity, torsional rigidity, bending moduli, softness, drape, and bending length) which is underway in the Textile Laboratory and is correlated with a similar program under the direction of the American Society for Testing Materials.

Capacity classes of millmen and research directors were conducted in special week-end courses during the year and demand for this type of instruction continues.

The Western Electric Company presented the department with an Olsen-Lundgren Static Balancing Machine which has been set up in the Power Measurements Laboratory.

The registration for Engineering Laboratory was larger this year than for several years. Three hundred and fifty students per week during the second term were handled in groups averaging less than six students.

During the course of the year Professor de Forest has perfected a three-element, high-speed, cathode-ray oscillograph to permit the study of high-speed stress conditions. This equipment makes possible the study of longitudinal and circumferencial stresses in gun barrels and was used for this purpose in an extensive study of the behavior of thirty-caliber rifles. Work for the N. A. C. A. was continued on the development of resistance strain gages, particularly the type making use of the change in electrical resistance of fine wire. The brittle varnish method of investigating strain distribution has been carried forward with increasing success. Better types of brittle coating have been developed and much experience has been gained in this type of stress analysis. A research project has been started for the Bureau of Construction and Repair of the Navy, involving a study of impact strains and the impact strength of materials. A Research Assistant has been assigned by the Navy to this work.

The Refrigeration Laboratory has been moved from Building 46 to the basement of the new Rogers Building. A constant temperature room has been installed to maintain any temperature between 80° and 100° F. for testing small refrigerating machines such as household refrigerators. Later, this room can be equipped to maintain temperatures down to zero.

A four-element motor-driven centrifuge, a flash-point tester and a seven-element cloud and pour-point tester have been added to the Lubrication Laboratory during the year. The double cone vistometer has been further refined. The apparatus added, which complies with A. S. T. M. standards, will facilitate the present investigation of the effect of filtering materials on general oil properties.

In coöperation with the Department of Metallurgy a comprehensive investigation has been undertaken for the Chrysler Corporation on the nature and properties of the surface finish of metals, with particular reference to wear and friction.

J. C. HUNSAKER.

Metallurgy. The Department of Metallurgy has had a successful year both with regard to effectiveness in undergraduate instruction and with respect to research. The physical changes referred to in last year's report have been found most satisfactory and have more than doubled the student capacity of the metallographic laboratories with no increase in the staff. The curriculum has been further simplified and at the same time made more elastic by the combination of several short courses with longer ones and by the introduction of elective time in the fourth year. There has been a gratifying increase in the number of students from other departments who are electing metallurgical subjects and in the number of doctor's candidates from other departments who have chosen Metallurgy as a minor field.

Professor Williams spoke before the New Haven chapter of the American Society for Metals, before the New England Association of Chemistry Teachers, and has contributed articles to *Mining and Metallurgy* and to *The Tech Engineering News*. With Professor Homerberg he has completed a revision of "Principles of Metallography" for the fourth edition of this text.

Professor Waterhouse has continued his activities in the professional societies as a Trustee of the American Society for Metals and a Director of the American Institute of Mining and Metallurgical Engineers and has lectured before both societies. He was honored by the request to give a series of lectures on "Recent Developments in Steel Metallurgy" at Jamshedpur, India. These lectures are given as a memorial to Dr. C. P. Perin, founder of the great steel plant at Jamshedpur.

Professor Thompson has completed the third edition of "Theoretical and Applied Electrochemistry" and presented a paper on "The Mechanism of the Reaction of the Lead Storage Cell" before the American Electrochemical Society.

Professor Chipman's new laboratories are in constant use and excellent progress has been made along various lines. Several papers are in preparation and will be published shortly. The lines of research are mainly (1) in the reactions of liquid iron with slags of various compositions and (2) studies of the solubilities of gases in steel. Professor Chipman presented a paper, with Dr. Hayes of the American Rolling Mill Company, on "The Mechanism of Solidification and Segregation in a

Rimming Steel Ingot." He organized and conducted a round table discussion on "Experimental Methods in the Study of Steelmaking" at the annual meeting of the Institute of Mining and Metallurgical Engineers, and attended two conferences on Open Hearth Steel, speaking at the first on the "M. I. T. Research Program in Steel Making" and at the second on "The Oxidizing Power of Open Hearth Slags." Dr. Chipman also received the Robert W. Hunt Award of the A. I. M. E. for a paper (presented with K. C. McCutcheon) on the "Evolution of Gases from Rimming Steel Ingots."

Professor Hayward has continued his research on the melting and casting of copper in controlled atmospheres with interesting and valuable results. He also contributed the chapter on Copper to the new and important work, "Reine Metalle," a recent German publication. The revision of his "Outline of Metallurgical Practice" has been completed and the new edition will appear shortly.

Professor Homerberg has continued his researches on the general subject of "Nitriding" with special attention to the relations between nitriding and fatigue and protection against nitriding. He has prepared a comprehensive booklet on "Nitriding" and has completed a revision of the "Principles of Metallography" with Professor Williams.

In the field of Radiography substantial progress has been made by Professor J. T. Norton and his associates in their studies of the scattered radiations occurring in the X-ray examination of thick metal sections. The reduction of scattering by filters is of primary importance as it will make possible the detection of much smaller defects than is now possible. In the diffraction field the principal interest is centered on the problem of the direct measurement of internal stresses in metals. A new diffraction apparatus purchased during the year has given some important results. Professor Norton has continued his activities in the study of internal friction in metals (damping) and has greatly increased the sensitivity of his instrument.

Professors Bitter and Kaufmann have spent much of the year in completing the large magnet laboratory. This is now in perfect running order and is being used by Professor Harrison in his spectroscopic researches and by Professor Keyes in his low temperature studies. Professor Bitter's own work on the

application of powerful magnetic fields to fundamental researches in metallurgy is also progressing satisfactorily. Two papers were presented before the American Physical Society and several others are about to be published. Professors Bitter and Kaufmann are also developing a laboratory course which will deal with applications of certain physical methods to metallurgy.

Professor Cohen has completed a two-year research program on the age-hardening of duralumin, the results of which were presented before the A. I. M. E. Doctor Cohen will present a joint paper with Dr. R. B. Gordon on the "Age-hardening of a Copper-Cobalt and a Copper-Iron Alloy" before the American Society for Metals. Various researches dealing with certain phases of "age-hardening"are in progress. A two-year program on the "Tempering of High Speed Steel" has just been finished and the results are to be presented before the American Society for Metals as a joint contribution from Doctor Cohen and Dr. P. K. Koh, a graduate student in the department. The work on "High Speed Steel" is being continued. Professor Cohen has continued his evening course for the University Extension and the interest in this work is indicated by an increase in the enrollment from 15 in 1936 to 74 in 1938. He also spoke before the annual meeting of the New England Association of Chemistry Teachers on "The Study of Metals and Alloys" and led a discussion on "The Teaching of Metallurgy in the Secondary Schools."

Although Professor Wulff has been giving only part of his time to the department this year, he has been actively engaged in three general lines of research (1) corrosion resistant alloys, (2) powder metallurgy and (3) surface structure and friction. The work on the pit corrosion of stainless steel has been continued as an Institute project and a number of papers have been published. The new course in Powder Metallurgy has attracted wide attention and favorable comment and the methods have made possible the development of new materials which are in use in researches in spectroscopy, nuclear physics, surgery and engineering. In collaboration with the Department of Mechanical Engineering, important studies are in progress on the structural analysis of steel surfaces by electron diffraction and the determination of the coefficients of static and

dynamic friction as related to surface conditions. Dr. Wulff has published two technical papers and two of a semi-popular type.

The Division of Ceramics has been greatly strengthened by the addition of a full-time Instructor to the staff. This change has not only made the undergraduate instruction more effective but has made more research possible. Professor F. H. Norton directed the Glaze Symposium at the meeting of the American Ceramic Society and presented a paper before the Refractories Division of the same society on "The Load Testing of Fire Brick." The number of applications for men trained in the fundamentals of the ceramic industry is greater than the number available and serious efforts should be made to attract graduate students into this field.

The most serious need of the department is additional space both for undergraduate instruction and for research. A marked increase in the number of students from other departments has overcrowded several of the laboratories.

ROBERT S. WILLIAMS.

Mining Engineering. With the discontinuance of Course III definitely set for 1940, the work of the department has been gradually tapering off and during the coming year it will remain for the skeleton staff to wind up the mining courses for senior and graduate students.

The loss, on account of poor health, of the services of Professor Hutchinson as head of the department and leader of the instruction in mining is a severe handicap for the remaining year. He came to us ripe from years of practical mining experience and for seventeen years gave his students an exceptional training in the problems and economics of mining which he was so well qualified to impart. His courses will be carried through by Professor Bugbee. Another serious loss is Professor Mann who is going to another institution. He has been responsible for the development of the petroleum engineering division on a high plane which has particularly attracted a number of graduate students. His work will be handled by Dr. W. L. Whitehead. By special arrangement, Professor Foster will remain and will divide his time between the Mining Department and the Division of Industrial Coöperation. It is a matter

of congratulation that arrangements for the year have worked out so well.

Although the volume of work is decreasing, the departmental activities have been carried on energetically. This is particularly true in ore dressing and, especially, in the field of physical fundamentals of flotation. Certain basic relations of conditions in the flotation machine to the variables expressing flotation results have been formulated and confirmed experimentally by Dr. R. Schuhmann, Jr. to supplement the empirical operating rules previously used. One project has been completed and another is still in progress on the general problem of relating flotation behavior to particle size and particle size distribution. Useful by-products of this work are a new apparatus based on the sedimentation balance principle for determining size distribution, and an accurate graphical method for calculating size distribution from the sedimentation data. An experimental study of the flotation of galena demonstrated the great deleterious effect of calcite slimes (which are very frequently present in commercial galena flotation), and in continuation of this work chemical methods of overcoming this deleterious effect are now being investigated.

The existence of a basic error in the standard method of calculating analyses from statistical microscopic counts on briquettes of elutriated fractions of fine ore dressing products has been demonstrated. The correction which should be applied to this method has been derived mathematically and justified experimentally for several artificial mineral mixtures.

Professor Locke has completed the manuscript for an entirely revised edition of the Textbook of Ore Dressing, which is due to appear in the fall. Professor Bugbee is similarly engaged in the revision of his book on fire assaying for a third edition.

The announcement of the discontinuance of Course III has resulted in the receipt of expressions of regret from many graduates of the department who have held the course in high esteem. As one of the original departments of the Institute, Course III has had a long, continuous and notable record of turning out broadly trained men who have achieved high standing in the profession of mining and metallurgy. Times are changing and methods of education progress. The method of teaching mining has been from the viewpoint of giving the

student a wide, practical and technical knowledge of the subject to enable him to enter the operating field immediately. A new field opening up is for broad training in the fundamentals of science and engineering, coupled with special instruction in the business and economic side of mining rather than the purely operating side.

One phase of mining is ore dressing or, as it is now frequently termed in a broader sense, mineral dressing. Under Professor Richards, Technology became one of the leaders in the teaching of ore dressing. This work will be carried on in a most active and progressive way and the department will be strengthened by the coming of Professor A. M. Gaudin, who is generally regarded as the leading specialist in flotation. Professor Gaudin started his work in the fall of 1939, as Richards Professor of Mineral Dressing, so that when the announced transfer of this division to Metallurgy is made in 1940, Professor Gaudin will have become well oriented in his work here and mineral dressing will become an important division of metallurgy. At the same time, it is planned that a new course in mine valuation and economic aspects of mining will be given by a member of the staff of the Geology Department.

May we not look forward to a new period of mineral instruction at Technology in which the Institute will take the lead in training young men for executive and business positions in the mining field with the expectation that just as in the period now drawing to a close outstanding men have been developed who have achieved success in mine operation? With such training men may go out from here to become leaders in the business of mining and, at the same time, other men will be going out with a special training in mineral dressing and both groups will later on be added to the list of Technology graduates who have become notable figures in the mining profession. The opportunities for graduates in mining, and particularly for men to enter the business side of mining, are still great. One needs only to survey the mineral production of the northeastern portion of the United States to realize these opportunities. It is true that this mineral production is not mainly of metals, but covers a great variety of non-metallic products including even stone, crushed rock, sand and gravel. Many of these non-metallic operations have not progressed technically

as they should, and it is believed that in almost every one of them there is an excellent chance for professionally trained men to become associated with the enterprise and bring about marked improvements in technique and economies in management. In fact, there are already several instances where Technology mining men have done exactly this.

CHARLES E. LOCKE.

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 another officer of the United States Coast Guard, and by nine officers of the Brazilian Navy. The quota of student officers in the Construction Corps of the United States Navy has been increased also by four men. A new drafting room has been provided for the Brazilian naval officers.

Five members of the Senior class in the five-year course in Marine Transportation have gone to sea as student observers or cadets on vessels of the American Republics Line, Grace Line, and Isthmian Steamship Line for the year of sea duty required as a part of their course.

A graduate course of one year in Naval Engineering for student officers of the United States Navy has been established with the approval of the Navy Department, and nine officers in the Navy and one in the Coast Guard have been ordered here for the coming year. This course is also open to a small selected group of civilians, and through the efforts of Mr. Joseph W. Powell three scholarships at $1,000 each have been provided. Six others have been sponsored by the Institute, the Society of Naval Architects and Marine Engineers, the United States Maritime Commission, and the Newport News Shipbuilding Company. A new drafting room has been provided for the student naval engineers.

The propeller testing tunnel referred to in last year's report is practically completed, and it is expected that some prelimi-

nary testing and research work on propellers can be undertaken during the coming year. The small towing tank for the department is still a subject of further investigation.

The Society of Naval Architects and Marine Engineers held its annual spring meeting here in May 1939 and papers were read by Professor F. M. Lewis and Professor C. R. Soderberg of the Institute's staff. The meeting was attended by about 150 members and included a trip through the Institute's laboratories and other outstanding points of interest.

HENRY H. W. KEITH.

SCHOOL OF SCIENCE

Biology and Public Health. This department, which a generation ago was one of the smallest in the Institute, has within this period grown constantly not only in numbers, but especially in the scope and significance of its work, and in the professional quality of its instruction. When the Institute moved to Cambridge in 1916 the space allotment to the department seemed ample for its future needs. Today it is probably the most crowded department in the school, and its development and usefulness are seriously hampered by lack of space and equipment. This statement regarding congestion, which was mentioned last year, is again reiterated because of the distressing situation. This fact has already been emphasized in the report of the Corporation Committee on the department.

Educationally, two important steps have been taken during the year. One of these, — the establishment of the four-year program in Food Technology and Industrial Microbiology as an independent division under the designation Course VII-B — has important educational and industrial implications since it has raised this course of instruction from a minor optional grouping to the dignity of a professional course especially adapted for the production of a new type of scientifically trained worker, the Food Technologist. The very rapidly growing food manufacturing industry has heartily approved the aims of this course of study. Briefly it is designed to give fundamental training in the combination of basic sciences, chemistry, physics, and biology (especially microbiology) and associates with these the principles of the technology of

handling and transformation of materials. In this type of training the department has been the pioneer and several other institutions are at present taking steps to organize somewhat similar courses of study.

A second advance in educational procedure has been the organization of a graduate program in public health engineering whereby suitably trained graduates in civil and structural engineering can broaden their training on the public health side and secure a Master's degree in Public Health Engineering in a year or year and a half of graduate work. This program has been developed especially with the approbation of chief engineers of health departments who wish to find opportunity for their junior engineers to broaden their professional training in sanitation and public health administration. Under the provisions of the Social Security Act such competent juniors with engineering degrees can receive an additional year of training at federal expense, and if well prepared, can gain a Master's degree in Public Health Engineering. Possibly this work in Public Health Engineering, which includes special training in sanitation and in public health administration coupled with engineering, may be the Institute's most valuable contribution to public health training, and especially advantageous in future years, because of the strong tendency on the part of the Medical profession to demand that other administrative positions in health departments should require an M.D. degree.

Undergraduate programs have remained practically unchanged although constant scrutiny is maintained to modify a few professional subjects and improve them to meet the changing conditions of current needs. The content of graduate courses has also undergone constant revision and extension in order to keep pace with the scientific developments in many fields such as biochemistry, vitamin synthesis, food technology and bacteriology.

The work in Biological Engineering is developing strongly and satisfactorily. Our first graduates from this division were quickly employed by research departments of companies who recognized the special qualifications of the men who had completed this five-year program. The significance of this field of work has been recognized by other institutions. Professor I. R. Taylor of Brown University was a guest of the department

during the first term, and Dr. H. D. Green of Western Reserve University will spend the next academic year in research here while on sabbatical leave.

Work in health education has continued to go forward. Former students at the Institute in this field are directing health education in the national government of eight countries, in state departments of ten states, and in a large number of local agencies, both volunteer and governmental. Under the exchange arrangement with Harvard University, courses in health education have welcomed students from the Harvard School of Public Health for seventeen years. Last year the Institute was the host to the first New England Health Education Conference of over 500 professional workers. This conference was under the chairmanship of Professor Turner. It was developed coöperatively by state departments of health and of education and by State Tuberculosis Associations. A gift of $6,000 has just been received by the Health Education Research Laboratory from the Charles H. Hood Educational Trust for the study of administrative coördination in health education.

A second Food Technology Conference sponsored by the department was held at the end of June. This was attended by over 500 representatives of the food industries. These included not only directors, chemists and microbiologists, but many officers of important companies. The Conference had the coöperation of the American Institute of Baking, the American Society of Bakery Engineers, the American Society of Refrigerating Engineers, and several foundations. The Presidents of the American Can Company and the General Foods Corporation made notable addresses. Men from many other large companies concerned with various branches of food technology presented valuable papers. More than a score of states and foreign countries were represented.

At the conclusion of the Conference there took place the organization of a new professional society, the Institute of Food Technologists, of which Professor Prescott was elected the first President. The technical qualifications for membership in this society are of high order. It is gratifying to know that this new group, which is more than national in scope, has come into existence as a result of the high quality of the Conferences which the Institute has sponsored and arranged.

In connection with the work in Food Technology announcement may be made of a fellowship for research in foods which has been established here this year by the American Institute of Baking. One of our Teaching Fellows of last year, Mr. Henry J. Rugo, candidate for the Ph.D. degree, has been appointed as the first holder of this fellowship.

The research activity of the department has been highly satisfactory, and all members of the staff have the belief that research and teaching should be inseparable. There is need for a larger number of research assistants to aid in this aspect of the departmental work.

It has been necessary, for reason of lack of space and facilities to limit the number of graduate students which can be taken, and a number of applicants have had to be refused admission.

Professors Bunker and Harris have published a number of papers on the vitamin researches of the past two years. It may be of special interest to report that they are supervising and working out the nutritional problems connected with the Byrd Antarctic Expedition, on which Dr. E. E. Lockhart (Ph.D. 1938) will be a member of the scientific staff as biochemist and nutrition expert. Professor Horton is engaged on biological engineering investigations of special importance in connection with hospitals, but which are not yet ready to be made public.

Professor Proctor has organized and is supervising investigations in food technology especially in connection with the aging and oxidation of foods under specialized refrigeration conditions. Professors Gould and Sizer have continued their researches in enzyme chemistry, with important publications. Professor Williams has published several papers resulting from his investigations of pathogenic fungi, and Professor Blake has been doing fruitful research in economic entomology.

The department acknowledges with gratitude the gift of a laboratory model from the International Filter Company, the provision of refrigeration equipment by the Frigidaire Division of the General Motors Company and of other equipment for use in Food Technology by the Dewey and Almy Chemical Company. It also acknowledges with deep appreciation the fine service rendered by our special lecturers.

SAMUEL C. PRESCOTT.

Chemistry. The largest first-year class since 1931 received instruction in elementary chemistry although 650 entering students taxed severely the available facilities in this most important subject. The student group was of higher intellectual level than heretofore, and exhibited fewer failures; teaching was also more effective and stimulating. An indication of the improvement in the effectiveness of instructional effort in this subject was evident in the summer course in qualitative analysis, which is required for this group. The first-year staff are continuing their efforts to improve first-year chemistry by discussing and testing modifications of teaching procedures and the selection of subject matter, with results which are increasingly evident in the upper years.

The number of students attending the required summer school in qualitative analysis was larger than ever (137 first session).* This is, however, only one indication of a general trend, for the November 1938 registration numbers show that 23⅓ per cent of the total of students registered at the Institute were in chemistry and chemical engineering, while of the total of graduate students these courses represented 33 per cent. Under the pressure of increasing numbers of students a carefully considered quota system must be practiced in order that improvement in the quality of instruction may continue.

The report of the previous year stated the need for increasing laboratory space, mostly by rearrangement, and additional equipment, to care for the increased numbers of students in physical and organic chemistry. Part of the plan prepared two years ago included a special laboratory for thesis students in all branches of chemistry. In the spring the administration allocated the funds for the realization of this laboratory, thereby marking a definite advance in improving conditions for promoting that very useful kind of education — self-education. The space which thesis students formerly occupied in the general organic chemistry laboratory is now released for the use of the increasing number of students for whom the subject is required or elected. Should present trends continue additional laboratory space will be imperative. The need for rearrangement of

* Thirty more were unable to attend because of finances. They will be given special instruction in the fall.

the physico-chemical laboratory will be intensified during the forthcoming year.

The subject of physical chemistry was, thirty years ago, generally regarded among chemists, excepting possibly physical chemists, as a desirable but scarcely necessary adjunct in the chemical curricula. The rapid advances of science as a whole have made it evident that physical chemistry bears the same relation to the broad field of chemistry that mathematical or theoretical physics bears to the world of physical phenomena. We have in fact arrived at a point where students of chemical science in every branch regard physical chemistry and its accompanying discipline in applied mathematics as an indispensable part of their serious studies.

The practical effect of the change in viewpoint has been a continuing increase in the number of students taking the subject, and the need for a modified course in addition to the excellent course in chemical principles developed by Professors A. A. Noyes and M. S. Sherrill and further perfected by the latter, became evident. The department Visiting Committee accordingly selected the subject of the teaching of physical chemistry for review and invited several friends and distinguished former members of the staff to join in the conference. No meeting in years has been more stimulating to the whole staff. The importance of the subject was confirmed and many suggestions growing out of the discussion are being considered for incorporation in our procedure. No fundamental changes in the present schedule of physical chemistry courses was recommended.

An interesting discussion arose in the course of the Visiting Committee meeting regarding the opportunities for our students to become acquainted with the chemistry of plastics. Only one member of the staff, Professor Morton, has carried on research in this and related fields, and a course will be offered in 1939–40. Another topic discussed was the importance of a general knowledge of patent law,* particularly by those students whose aim is industrial applications. These suggestions are being discussed further by a committee of the staff.

The teaching fellowship plan has been in effect three years,

* A course of this kind should be given outside this department in view of its nature and general importance.

and it has proved entirely satisfactory. The Fellows have rated exceptionally well in their courses and research, while their contacts with undergraduates in laboratory instruction have been all that could be desired. As the fellowship plan was originally outlined summer research work was proposed; the final year of graduate study to be entirely free for concentrated effort on the research. The need of more scholarships carrying about $1,000 each is imperative to free the student financially in his final year of study. In recognition of this general need Doctor Compton has already established several such fellowships, and it is earnestly hoped that the importance of the fellowships will prompt donation of funds to increase their number.

The Department of Chemistry is the only one known which offers advanced research opportunities in all three of the major branches of chemical science,— Inorganic, Organic and Physical. The applications for admission to the graduate school of chemistry were well over 100, but only about one in seven could be accepted last spring, the quota even then being exceeded. A procedure which will discover the most talented young men among such a large number of applicants is exceedingly difficult to formulate in view of the poor correspondence between ability and material resources. The staff is, however striving to make the selections with attention to a rational balance of qualities in the candidates selected.

A number of summer graduate courses were offered in 1939 intended for students entering upon graduate study. One purpose of the courses is to make possible an earlier beginning of the research project. The advance of science has made the classical three-year period for the doctorate far too short, and the research, which provides the principal evidence of creative ability, does not receive the time and sustained study it should to produce a really competent and publishable contribution. The existing situation can be materially improved by placing the graduate school on a twelve-months' schedule as has been repeatedly suggested in these reports.

The belief, some dozen years ago, that inorganic chemistry research would discover in this neglected field much of value to science and its applications has been confirmed. The projects formulated years ago by Professor Schumb and his group have

been followed and are now providing a good yield of very satisfying results. Some of the topics under investigation are as follows:

(1) use of the property of induced radioactivity to follow the details of chemical interactions, using synthetic isotopes,

(2) the direct measurements of hitherto inaccessible physical properties by means of induced radioactivity,

(3) chemistry of the rare earth elements,

(4) study of possible sources of the missing elements,

(5) application of electron diffraction methods for the determination of details of the structure of inorganic compounds,

(6) chemical reactions in the solid state, and

(7) development of concepts of polymorphisms.

The Research Laboratory of Organic Chemistry is exceptionally well equipped with physical apparatus used in measuring the physical constants of all pure organic compounds encountered in research. A Pulfrich refractometer with accessories has been acquired during the year, the principal use for which is in promoting the identification of carbohydrates. Additional equipment has also been installed by Professor Morton for fractionation and distillation. The laboratory is now exceptionally well provided for purifying organic compounds, an item of increasing importance.

A series of conferences by the organic group was held during the year for the purpose of examining the present schedule of graduate study in organic chemistry. The effort will be continued with the expectation of making more effective use of the time of students and staff in this section of the graduate school. The total number of students in the subject was 49, and the demand for graduates with the doctorate in all branches exceeded the number graduating.

Professor Beattie and his principal co-workers, Doctors Blaisdell and Kaye, spent a considerable part of the year reducing some five years' observations on gas thermometry. The data provide the means of establishing on the thermodynamic scale the temperature of ice in equilibrium with water under the pressure of one atmosphere of air, and also the relation between the scale of the platinum electrical resistance thermometer and the thermodynamic scales. The values obtained by the group for steam, mercury, and sulphur normal boiling points were incorporated by the National Bureau of

Standards in its recommendations to the International Committee meeting in Paris in July. Another United States committee is also recommending a value for the ice-point temperature based on the work of Professor Beattie and his colleagues.

Professor Collins, and Doctor Jacobs, Lalor Fellow for 1938–1939, devoted a portion of the year to an experimental determination of the effectiveness of a number of types of heat interchangers for use with the low temperature engine. It is desired to produce a quantity of refrigeration mechanically at the thermodynamic temperature 10°, and a critical item is the requirement of a very highly effective interchanger. Success rewarded the effort to produce a satisfactory interchanger, and it is hoped the remaining obstacles to a successfully operating engine will be surmounted during the coming year. The result will be a means of producing refrigeration for the cryogenic program entirely free from the hazards involved in using hydrogen.

The American Chemical Society preparations for the Boston convention from September 11 to September 15 required much of the time of our staff, particularly Professor Huntress, Chairman of the Northeastern Section, and Professors Hamilton, Millard, A. R. Davis, Ashdown and R. C. Young. A symposium on cryogenic research was organized and held September 11 in the Eastman Laboratories. A special lecture of a semi-popular kind on the properties of matter at low temperatures was requested of the department as a feature of the convention.

The department acknowledges with gratitude the gift of a quantity of dehydroandrosterone from the Schering Corporation of New Jersey, for promoting Professor Milas' research on hormones. Merck & Co., Inc., kindly loaned the department an exhibit of organic chemical substances and also one of inorganic substances for use at lectures in the first year.

The graduate fellowship provided through the generosity of the Polymerization Process Corporation was renewed for the current year.

FREDERICK G. KEYES.

General Science and General Engineering. The question is often raised as to the field of activity with which

graduates of the courses in General Science and General Engineering finally become connected. A survey has been made of those graduates from 1920 to 1934 who have given sufficient information for definite classification.

Nearly half (48 per cent) of the graduates are engaged in business, 37 per cent in engineering or research, 11 per cent in teaching, 2 per cent in medicine, and 2 per cent in law. The period covered by the survey may be regarded as modern but not so close to graduation as to include temporary connections.

Among those engaged in business 22 per cent are either president or general manager of their respective companies, 8 per cent are associated with insurance and 9 per cent with banking.

In the engineering and research group 34 per cent are associated with mechanical engineering, 20 per cent with electrical engineering, 13 per cent with aeronautical engineering and 11 per cent with chemical engineering.

RALPH G. HUDSON.

Geology. This year has been a very satisfactory one in the department from the standpoint of undergraduate and graduate enrollment and accomplishments in research. Much attention has been given to improvements in instruction, but no important changes in subjects or curricula were made. In addition to their routine teaching and research activities the members of the staff have been occupied as follows:

Professor Shimer and Professor Shrock are engaged in a revision of Professor Shimer's important work on North American Index Fossils which has been out of print for some time. This revised work is to be published by the Institute. In addition to this, Professor Shrock carried on investigations in sedimentation. Professor Slichter continued his seismic investigation of the earth's crust in New England. During the year five large quarry blasts were observed and records obtained at thirty-two widely distributed points. The most distant station at which a record was obtained was 350 kilometers from the blast. Data of excellent precision were obtained concerning seismic wave velocities in the deep crust in New England and values for the depths to several pronounced transitions were obtained.

Professor Newhouse has devoted considerable time to editorial work on a symposium which deals with the relations of ore deposits to geologic structures. Work has been completed on a summary chapter in which an attempt has been made to bring together the data contained in the work submitted by about seventy contributors to the volume. This volume, which will be published at an early date, will be of outstanding importance to the mining industry.

Professor Buerger is continuing work on a book on crystal pattern analysis, which is now nearing completion. During the year he made a study of the crystal structure of gudmundite (FeSbS), which turned out to be the key to the field of existence of the arsenopyrite crystal structure type.

Professor Morris continued the studies begun in his sabbatical journey of 1937–38, preparing papers on the Pacific Ocean Basin, the peninsular gneisses of India, and the granites of Aswan. He has also done considerable work on various problems related to mineral industries in New England. Professor Fairbairn made an investigation of the relation of breaking and gliding effects in quartz to its crystal structure. During the summer he has been engaged in geological work in the Sudbury Basin of Ontario for the Provincial Geological Survey.

Professor Mead has been engaged in various problems in engineering and mining geology and spent the summer months in geological studies in the interior of Alaska.

Dr. Waldemar Lindgren terminated his editorship of the Annotated Bibliography of Economic Geology and has been seriously ill since midyear.

WARREN J. MEAD.

Mathematics. To provide more adequately for students interested in applied mathematics, Course XVIII was divided into three options during the year. The first of these options is designed for students intending to take graduate work and enter upon a career of research and teaching. The second is arranged for students interested in technical applications and the third for those preparing for industrial statistical work and the actuarial profession.

In September 1938 the Departments of Mathematics and

Economics and Social Science held a two-day conference on engineering and industrial statistics attended by representatives of about one hundred industrial concerns. In June 1939 the same departments coöperated in giving a two-week course in industrial statistics for the benefit of junior executives concerned with the application of statistical methods for quality control.

During the year an extensive program of research in pure and applied mathematics and mathematical statistics was carried on by members of the department. Professor Wiener and Brockway McMillan investigated fundamental questions of statistical mechanics which one meets in the study of gases and liquids. For this purpose they used a new technique invented by Professor Wiener which greatly simplifies the mathematical handling of such problems. Professor Crout developed a new method for the approximate solution of linear integral equations using a table for LaGrange interpolation which he and Professor Rutledge have recently computed. Professor Wadsworth and Harold A. Freeman of the Economics Department coöperated in a number of statistical investigations for industrial concerns. Professor Franklin continued his work on the four-color problem. Professor Struik made further investigation of the algebraic properties of tensors and the application of tensors to Riemannian manifolds. Professor Cameron is working on integral equations and he and Professor Martin are applying analytic Fourier-Stieltjes transforms to integral and difference equations. Professor Levinson is writing a book on gap and density theorems for the colloquium series published by the American Mathematical Society. Doctor Clifford is investigating partially ordered abelian groups.

H. B. PHILLIPS.

Physics. The freshman instruction in physics, under Professor Boyce, has followed along the same lines developed in previous years. A number of staff members are being trained as lecturers for this course, so as to allow greater flexibility and to handle more adequately any cases of sickness or absence of lecturers. The sophomore instruction is likewise unchanged in its fundamentals. Professor Frank has taken over the direc-

tion of the special group for electrical engineers and physicists, relieving Professor Wulff, who transfers at the end of the year to Metallurgy. Professor L. C. Van Atta has taken charge of the laboratory, and is making improvements in equipment which have been needed for some time. The undergraduate schedule of Course VIII has received only minor alterations. The course in Applied Physics, instituted in the year 1936–37, has proved very successful, and about half the undergraduates in Course VIII are now electing this option.

Construction of the cyclotron, funds for which were given by the John and Mary R. Markle Foundation, as reported last year, has been largely carried out during the year. The Institute contributed $15,000, from the Pierre du Pont Special Fund, for the construction of a small building to house it, and the building was completed during the fall of 1938. Since then the cyclotron has been constructed and installed, and while it is not yet in operation, only minor adjustments remain to be made. In the design of the cyclotron, full use has been made of the coöperation of the engineering departments of the Institute, and both in design and in the speed and efficiency of its construction, it is outstanding among the cyclotrons of the same size recently built in this country.

The table of 100,000 most important spectral lines of the elements, mentioned in last year's report, has been published during the year, forming an important concrete result of the spectroscopic project being carried on with assistance from the Works Progress Administration. This table contains many more lines than any previous compilation of the sort, measured with much greater accuracy, and constitutes an important milestone in spectroscopic research. Another important advance during the year has been the installation and operation of the large electromagnet for studying the Zeeman effect, designed by Professor Bitter of the Department of Metallurgy. This magnet is far more powerful than any previously used for continuous spectroscopic investigation, and it is greatly increasing the usefulness of the spectroscopy laboratory for fundamental research in spectroscopy.

The high voltage laboratory has been used during the year for the development of ion sources and discharge tubes for the acceleration of positive ions. Considerable success has been

achieved in this difficult field, ion currents of upwards of a hundred microamperes having been accelerated down the tube at voltages of the order of two million, a much larger current than has been obtained in other laboratories with similar equipment. Believing that further development of ion sources has now been shown to be necessary, such development will be carried on in a separate apparatus during the coming year, and the high voltage outfit is being adapted again for the acceleration of electrons.

The other research of the department has progressed steadily during the year. Professor Mueller has made interesting discoveries relating to the scattering of light. Professor Hardy has completed the construction of a new color analyzer, which is now in operation. The work of Doctors Cartwright and Turner in reducing the reflecting power of glass has created wide interest. Researches in X-rays, electronics, theoretical physics, and other fields have shown valuable progress.

The electronics conference and the spectroscopy conference have been successful, as usual. There have been a number of distinguished guest speakers in various colloquia before the department, including Professor N. F. Mott of the University of Bristol, Dr. A. W. Hull of the General Electric Co., Professor J. E. Lennard-Jones of Cambridge University, and Professor L. Brillouin of the College de France.

JOHN C. SLATER.

SCHOOL OF ARCHITECTURE

Architecture. The goodwill and coöperation with which the School of Architecture was welcomed to its new quarters in Cambridge soon banished the last lingering vestige of regret over leaving the spacious halls and much-loved associations of the old Rogers Building. Staff and students alike quickly settled into their new accommodations, and no sooner were they settled than the advantages of closer association with the facilities of the Institute brought added impetus to the work of the School.

Perhaps of all our many advantages the Library is particularly appreciated. Its convenient arrangement and perfect lighting, not to mention the ease and courtesy of its operation,

has won recognition from students both within and without the School.

Carrying out the recommendations made last year by the committee appointed to study means of broadening the scope of our graduate study, seminars were planned in coöperation with Professors Voss, Moon, and Burchard, that gave our advanced students opportunities for specialized study in the technical aspects of the design of a Faculty Club. These seminars, under the direction of some one of the above experts in conjunction with Professors Anderson or Reid, brought the advantages of the School's location in Cambridge significantly to the attention of all concerned. The students who were already familiar with the essential design aspects of their problem, were able to turn their attention to the related fields of construction, materials, or lighting, to their great benefit. It is planned to continue and extend this feature of our graduate study in the coming year.

Another undertaking that produced excellent results was the study of a small housing development on a piece of property, within easy reach of Cambridge, for which four presumed householders lent themselves and their time as clients so that before graduation the students might learn from actual experience how various and varying are the demands of different individuals for houses of relatively similar accommodations.

The attempt to secure the coöperation of groups of architects, contractors, and the manufacturers of building materials to provide opportunities in their offices during the summer months for some of our undergraduates was pushed further. Progress was necessarily limited by the unsatisfactory economic conditions prevailing throughout the country, but the idea wins approval, and we hope that the coming year may bring positive results.

Thanks to the interested coöperation of the Treasurer and the Administration, the hoped for facilities of a student shop are being provided in the space originally set aside for this use. At the same time the ample fourth floor corridors are being utilized for an exhibition of building materials. These two features of our new quarters will, we believe, give our students a realizing sense of the effect of materials upon design in a direct and forceful manner.

From the point of view of public recognition of the ability of our students and recent graduates, the School has had one of the most successful years in its history. Among specific recognitions may be mentioned the following:

Emerson Prize — open to all students in the United States — for An Entrance Gateway and Inclosure to a Museum, won by A. Sweeney, Jr.; W. W. Caudill placed second.

Boston Society of Architects Prize — offered to the best design submitted by a student at Harvard, Technology, or the Boston Architectural Club — for a Dance Pavilion in a Municipal Park, won by J. G. Kelley. (Fourth year in succession.)

Rotch Travelling Scholarship — for two years of foreign travel, won by W. E. Hartmann.

Productive Home Competition — open to architects throughout the United States. In three of the five regions into which the country was divided our students were successful: for the Northeast, A. Dukelski, '28; for the Middle West, H. Weese, '38; and for the Southwest, L. W. Worley and W. W. Caudill, '38–'39 graduate students.

Glass House Competition — open to architects throughout the country, won by H. Kemp, '37 Grad.; W. Kaeser, '32, placed third.

Friends of the School have been most generous in their gifts of books and periodicals to the Library, a list of which follows:

Albert Farwell Bemis Foundation, Prof. John E. Burchard, Director — Collection of approximately 200 reports and pamphlets on Housing.

Mrs. Henry G. Chamberlain — All numbers since 1925 and subscription to "Old Time New England," Bulletin of the Society for the Preservation of New England Antiquities.

William Emerson — Approximately 350 books, plates, clippings, and periodicals.

Massachusetts State Planning Board — 400 pamphlets, periodicals, etc., on Housing and City Planning.

Mrs. Arthur W. Rice — 245 Architectural books dealing mainly with the Renaissance.

Mr. W. A. Rowlands, University of Wisconsin — Approximately 30 pamphlets on Wisconsin Planning and Housing.

Mr. Everitt Kilburn Taylor — Three volumes 1737 Blondel and two volumes of Daviler "Cours d'Architecture . . ." 1720.

In addition, Mr. Alfred Loomis has given to the School his Sunlight Analysis Machine which has already been conspicuously useful to students in both City Planning and Architecture.

No chronicle of the year's events should close without a tribute of gratitude and thanks to the Corporation and the

Administration for the generous and hospitable Reception and Welcome extended in the nature of a house-warming to the Dean and staff of the School of Architecture in their new quarters on December 12, 1938.

The most important event in the School's year was the appointment of Walter R. MacCornack of Cleveland, Ohio, to succeed William Emerson as Dean. He brings to his task the respect of the entire profession, earned by years of valued service to the schools of Cleveland and more recently to the housing problems of that city. As a graduate of this School and as a member of its Advisory Committee for eight years past he has acquired an understanding of the School's needs and a sympathy with its policies that assure a continuance of those qualities that have marked the seventy-three years of the School's existence. He enters upon his new responsibilities not only with the enthusiastic backing of his predecessor, but with the assured coöperation and goodwill of the entire staff.

WILLIAM EMERSON.

City Planning. The most important development during the year was the inauguration of a research program in the field of housing, with particular emphasis on those aspects closely related to community planning. The objective of this program, which was made possible by the appointment of a full-time research associate and three part-time graduate research assistants, is the development of improved procedures and criteria for use in the selection of areas for residential purposes, with particular emphasis on the proper relationship of such areas to places of employment and to facilities for transportation and recreation. Effective use has been made of opportunities for coöperation with the United States Housing Authority, the National Recreation Association, and the Committee on the Hygiene of Housing of the American Public Health Association. Considerable progress has already been made on the program under the direction of Mr. Victor Martin, Research Associate, and arrangements for its continuance during the coming year have been completed.

In the curriculum of the city planning course the policy of including a number of lectures by visiting experts was contin-

ued, and a collaborative problem in design was successfully carried out between groups of advanced students in architecture and city planning.

In March the instructing staff lost the services of Mr. J. Ross McKeever, instructor in city planning since 1936, who resigned to accept an appointment in the Technical Division of the United States Housing Authority.

In June of this year, together with Dr. C.-E. A. Winslow, '98, Professor Adams represented the Committee on the Hygiene of Housing at a meeting of the Housing Commission of the League of Nations at Geneva, Switzerland, attended by six members of the Commission and ten experts in city planning, housing, and public health from the United States, Great Britain, France, Holland, Poland, and Sweden. Professor Adams was appointed chairman of the drafting Committee on Town and Country Planning and presided at the first day's meeting, which took up problems of the planning of space in relation to health.

That a real need exists for men with professional training in the fields of city planning and housing is indicated by the results of a questionnaire sent in May of this year to all former students of Course IV-B. Thirty-four questionnaires were sent out and thirty-three replies received, a tabulation of the latter showing that 67 per cent of former students were professionally employed in the fields of planning or housing; 30 per cent were employed in allied fields; and only one former student was unemployed. Nine of those who replied were devoting either full-time or part-time to teaching city planning or architecture at the following institutions: M. I. T., Columbia, Cornell, Pennsylvania State College, Western Reserve University, University of Utah, University of Oregon, and the Architectural Association School in London, England.

A new course in Planning Legislation, given by Professor Flavel Shurtleff, was added to the curriculum of the summer program in Planning given this year at the Institute for the second time in coöperation with the American Planning and Civic Association. Details of the program will be found in the report of the chairman of the committee on the Summer Session.

FREDERICK J. ADAMS.

Drawing. The wide diversity of training in Drawing which students have received before entering the Institute, has long imposed difficulties on the Section of Drawing, detracting from the ultimate results obtainable in the one year of Drawing given here.

Believing that this is primarily due to the lack of uniformity both in secondary school courses and in the training of secondary school teachers, the Section established this year a summer course in Graphics for such teachers. It is hoped that over a period of years this course will have a strong influence toward unifying secondary school courses throughout the country both by improving the teacher's understanding of the fundamentals of his subject and by informing him of the training that universities would consider ideal for entering students. Thus ultimately the Institute should be able to greatly expand and improve the content of its own course by receiving students already competent in much of the ground work now consuming a considerable part of the time allotted to the subject.

In May the first lectures using projected three-dimensional drawings as a teaching tool, were delivered in the form of a review of the course in Descriptive Geometry. Such lectures will hereafter be considered a regular feature.

Lectures on the making of stereoscopic drawings were also delivered to the New England Association of Mechanical Drawing Teachers and the Drawing Division of the S. P. E. E.

The value of this new drawing tool is convincingly demonstrated by the interest shown by other universities and by the number of them that are now planning to start investigations in this field.

JOHN T. RULE.

DIVISION OF HUMANITIES

Economics and Social Science. No major changes in the curriculum have been made this year. Our efforts have been directed toward improving the content of courses and methods of teaching, especially in the fields of Labor Relations, Sociology and Psychology. We are attempting to correlate the subject matter in these areas with a view to restricting the number of different subjects offered. This has necessitated close collaboration among the various instructors concerned.

The first result of these efforts was a general course in social science offered the past year as a graduate subject. We are planning to make similar adjustments in the undergraduate program.

Some members of the department have been active in research or writing for publications; others have spoken on the radio and before various civic organizations. We have continued our monthly book reviews in Mechanical Engineering; and progress is being made in a thorough revision of our textbook in general economics. In June three excellent students were graduated from the five-year course in Economics and Engineering. The increase in graduate instruction because of the Sloan fellowships, has been handled satisfactorily and the presence of these excellent students has provided a valuable stimulus to members of the staff.

The Industrial Relations Section has made continued progress along its major lines of activity. Material is constantly being added to the Library, and increasing use of this information is being made not only by students but also by persons outside of the Institute. A conference, with the discussions centering about the general topic of the Process of Collective Bargaining, was held last November and was attended by more than 100 business executives, personnel administrators, and representatives of labor. Plans are now being laid for a second conference to be held this November. Several research projects are being actively pursued, among them a study of wages and employment in a New England manufacturing community, an intensive study of industrial relations in a manufacturing firm, and, in coöperation with the Bureau of Labor Statistics, exploratory inquiries into wage movements and technical changes in selected industries.

In conjunction with the Department of Mathematics we offered during the summer of 1939 a two-week course for statistical workers in industry to enable them to acquire the rudiments of modern statistical technique as applied to the control of quality of industrial products. This technique was applied to practical problems brought to the course by those attending and to problems analyzed at the Institute during the past several years. Twenty-one attended the course and eighteen companies were represented. RALPH E. FREEMAN.

English and History. Our efforts this year have again been directed toward improving the organization and presentation of the several options offered by the department. Oral presentation was given special emphasis during the second term of the freshman work. The generous coöperation of the Department of Electrical Engineering made it possible for us to record, for the first time, two talks by each student taking the General Study in Public Speaking. We hope to continue the recordings next year under conditions which duplicate a little more faithfully those experienced by a person speaking before an audience.

In an attempt to provide further instruction for juniors and seniors who have unusual difficulty with composition, we organized a small group which met throughout the second term. No credit was received for the work; instruction was for the most part given in individual conferences; and a student was allowed to leave the group as soon as he had demonstrated his ability to recognize and correct his mistakes. Many upperclassmen also took advantage of a consultation service offered by the department and brought papers and reports written in their professional courses to be discussed with an instructor in English from the standpoints of organization and presentation. The indications point to an increase in the opportunities for this type of instruction.

Under an arrangement for an exchange of professors, Mr. Sterling Lanier was able to spend the year in Cleveland at the Case School of Applied Science, while Professor Robert L. Shurter spent the year as a member of our staff. The experience proved to be agreeable and worthwhile for both men, and this department profited by it in terms of new ideas.

HOWARD R. BARTLETT.

General Studies. During the past year the contents of some of the General Studies have been revised, a few changes have been made in the hours assigned, and two new subjects, "Comparative Economic Systems," and "The United States and Latin America" have been added to the list. Though further thought has been given to the problems raised in last year's report, no action has been taken. Dean Caldwell now takes over the supervision of this important part of our educa-

tional program, and we may be sure that his broad experience and sound judgment will manifest themselves in a sound policy of development for General Studies.

RALPH E. FREEMAN.

Military Science and Tactics. A plan was put into effect this year to give a more equitable distribution of the students in the second term, sophomore year, to the five branch units of the R. O. T. C. at the Institute. At the close of the first term each student submitted his first and second choice of branch, and assignments were made to fill quotas on the basis of class standing in Military Science subjects. However, in cases where students had a strong preference for a single branch, they were permitted to join this branch regardless of class standing.

Several changes were made in the Sophomore lecture courses with a view to giving more balanced instruction in the basic military subjects. The number of lectures in the subjects of Defense Against Chemical Warfare, Signal Communications, and Map Reading were reduced by a total of eight lectures, and these periods were taken up with lectures on the Arms and Services, Mechanization, and Military History and Policy.

There was a further increase in the number of applicants for the advanced R. O. T. C. courses. An increase in the War Department quota from 285 to 320 for the coming year was requested and has been approved.

The rifle team again had a successful season, winning 13 of its 17 matches, and winning first place in the Hearst Trophy match. Facilities for rifle practice are still very limited, but this difficulty should disappear with the completion of the new gymnasium.

As usual, all units of the department were rated as excellent by the Corps Area inspectors.

The War Department has offered to supply certain modern equipment, such as one of the latest 3" A. A. guns, provided suitable storage space can be made available by the Institute. So far it has not been possible to take advantage of this offer because the necessary space cannot be found.

C. THOMAS-STAHLE.

Modern Languages. During the year there was a slight increase in the numbers taking foreign languages, a total of 390 as compared with 360. Of these, 290 were in German, 81 in French, 16 in Spanish; 39 were graduate students. In the second term a brief course in Italian was given, providing sufficient training to enable a student to read scientific Italian with accuracy and reasonable ease. Although French as a required language does not occupy a large place in the Institute its popularity as an elective is proved by the relatively large number (19 in the second term) taking the French Literature General Study.

At the beginning of the year the department's headquarters were moved from Building 2 to the new offices and classrooms in Buildings 7 and 5, a more central location offering many advantages, the greatest of which, perhaps, being the proximity of the Phonograph Room to the departmental offices; formerly it was a long distance away on the top floor. This change has greatly stimulated the use of the phonograph service and made easier its control. In this connection we would again emphasize the fact that the facilities of our phonograph service, with its records in four languages, are open to all students and members of the staff.

Our main teaching problem remains practically unchanged. As the majority of our students take a foreign language for only one college year, and as our avowed main objective is the attainment of a reading knowledge of the foreign language, the emphasis is placed on training in reading based on a thorough mastery of the essentials of grammar and vocabulary. Easy reading is introduced very early in the course. In the middle of the second term of the first year of language each student is required to select from the French or German scientific journals some article of special interest to himself and prepare a written translation of several pages from it. His translation is then carefully gone over with his instructor in private conference. In the second year of the language this policy of individual "projects" of study and translation is begun early and continued along with the regular program.

This system had been under experimentation on a moderate scale in the department for two years before its general adoption last year. It has created great interest. Its practical advantages

are evident. It introduces the student very early to foreign language journals and the important research work being done abroad, besides giving him the most effective practice in reading in his own field, but it draws very heavily on the instructors' time as it involves over 300 different studies in one year in the various fields of science and engineering.

In extra-curricular activities the Cercle Français continued its programs of French moving pictures, lectures and recitations in French, dramatic readings. An especially brilliant lecture entitled "*Qu'est-ce qu'un Français?*" was given by Professor André Morize of Harvard. Although the number of students taking Spanish at the Institute is rather small there is with us a large group coming from countries of Spanish speech. To bring these together a series of Spanish meetings was arranged by Mr. Koch under the name of *El Grupo de Habla Espanola*, the programs of which included the following lectures in Spanish: one on Cuba by Dr. Gustavo A. de Aragón, one on the Colombian poet J. A. Silva by Dr. Eduardo Gómez-Durán, Colombian Consul at Boston; and one on the progress of aeronautics in the United States by Señor Heraclio Alfaro. The department also coöperated in the French Table which met each week at the Walker Memorial.

For several years the examinations in foreign languages required of candidates for the doctorate have been given to each student separately after personal consultation and advice. This system had many advantages but was a heavy, constant drain on the department's time as it involved two examinations each (French and German) for about 200 men in one year, a total of 400 written tests of about two hours each, given at times largely determined by convenience to the student. In response to a vote of the Graduate School Committee, with a view to economy of time and effort, we shall change our system, offering this coming year three general examinations for this purpose, in October, February, and May. Whether this arrangement will work better than the former one remains to be seen.

The only change in the staff was the appointment of Dr. Friedrich W. Grob, doctor of law of the University of Berne, as part-time instructor in German. Unfortunately, Dr. Grob is prevented from returning to his duties owing to the mobilization of the Swiss army.

Last spring Mr. Koch gave a short-wave broadcast in Spanish to Spanish America dealing briefly with the history and aims of the Institute. Professor Langley spent most of the summer in Mexico.

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, 1939, as well as the financial transactions during the fiscal year ended on that date.

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

Capital Gifts

Coleman duPont Estate (additional)	$5,397.93
A. F. Bemis Charity Trust, for Research	385,483.42
Estate of Marcella B. Upham for Thomas Upham Fund	302,794.00
Curtis-Wright Corp., for Wright Memorial Wind Tunnel	7,500.00
S. Slater & Sons, Inc., for Wright Memorial Wind Tunnel	2,500.00
Contributions to Alumni Fund	89,319.40
Contributions to Emerson Prize Fund	2,059.00
Elizabeth R. Stevens Estate (additional)	4,100.00
Estate of Francis H. Williams (additional)	24,695.68
Estate of Stephen L. Bartlett, for Endowment	306,747.40
Estate of James W. Henry (additional)	172.71
Estate of Emerette O. Patch (additional)	740.84
	$1,131,510.38

Miscellaneous Gifts

Contributions of Research Associates 1939–40	$1,250.00
Contributions of Research Associates 1938–39	32,700.00
Contributions to Industrial Relations Fund	35,150.00
Anonymous for Albert Fund	1,000.00
Anonymous for Tuition	600.00
Anonymous for Schwarz Memorial Fund	1,221.86
Textile Foundation for Research	5,000.00
American Institute of Baking, for Fellowship	750.00
Contributions, Bursar's, Dean's and Tech Loan Funds	625.00
American Institute of Mining and Metallurgy Engineering, Inc., for Research	500.00
Association of Manufacturers of Chilled Car Wheels, for Metallurgy Chilled Iron Fellowship	2,000.00
American Philosophical Society, for Research	3,000.00
Carnegie Institution of Washington, for Research	3,000.00
Carnegie Corporation, for New Wind Tunnel Equipment	15,000.00
Carnegie Corp. of N. Y., for Aerodynamic Research	9.000.00
Carnegie Corp. of N. Y., for Research Center of Analysis	30,000.00
Alfred L. Loomis, for President's Special Fund	5,000.00
Harold K. Hochchild, for Research	500.00

Research Corporation, for Research	$31,730.00
Professor and Mrs. William Emerson, for City Planning	725.00
E. I. duPont de Nemours Co., for Fellowship	750.00
Alfred P. Sloan Foundation, for Fellowships	15,000.00
Alfred P. Sloan, Jr., for Fellowship	1,000.00
L. J. and M. E. Horowitz, for Building Construction Course	6,000.00
Rockefeller Foundation, for Salaries and Research	4,500.00
Contributions to Glass Fracture Research	2,500.00
Milton Fund of Harvard, for Iodine Research	3,300.00
Contributions to Glass Industry Research	1,000.00
Geological Society of America, for Salaries and Research	6,644.75
G. M. Hyams Trust, for Research	4,000.00
National Research Council, for Research	1,000.00
C. Lillian Moore Estate, for Grimmons Fund	1,785.10
Contribution, Friends of the Library	250.00
Contributions to Research, Business and Engineering Administration	150.00
Alan C. Bemis, for Meteorology Department	100.00
Contribution to Sailing Pavilion	100.00
William Lowell Putnam, for Prize Fund	300.00
James C. Melvin Trust, for Scholarships	3,250.00
Eddy-Rucker-Nickels Co., for Mathematics	500.00
	$230,881.71
Total Capital and Miscellaneous Gifts	$1,362,392.09

PLANT

The educational plant assets passed the $16,000,000 mark during the year with the completion of the new addition and entrance to the Main Building on Massachusetts Avenue, the Wright Memorial Wind Tunnel, the Magnetic Substation, the transfer of the Athletic Field to the land west of Massachusetts Avenue, the building of the new Briggs Field House and the Cyclotron Building.

Excavation has started on the first of the Alumni Gymnasium Units — the Swimming Pool — which will be ready next summer. There is also a new laboratory under construction for the Solar Energy Research Project.

The Graduate House (former Riverbank Court Hotel), operated as an investment, was fully occupied during the year and additional accommodations are being provided for the coming year.

Bexley Hall, an apartment house opposite the Institute containing 48 housekeeping suites, has been purchased as an investment. Extensive renovations are being made and provision is thus made for a limited number of married staff members and graduate students.

OPERATION

SUMMARY OF OPERATING INCOME AND EXPENSE

(Schedule B)	*1937–1938*	*Per Cent of Total*	*1938–39*	*Per Cent of Total*
Income from Students	$1,505,400	50%	$1,840,000	58%
Income from Investments	1,284,300	43	1,126,400	35
Income from Other Sources	218,800	7	236,900	7
	$3,008,500	100%	$3,203,300	100%
(Schedule C)				
Academic Expenses	$2,035,900	67%	$2,141,500	67%
Administration Expenses	323,500	11	361,700	11
Plant Expenses	337,600	11	345,700	11
Miscellaneous Expenses	319,900	11	359,500	11
	$3,016,900	100%	$3,208.400	100%

The sum of $25,000 was required of the Income Equalization Reserve Fund to meet budgeted expenditures — considerably less than expected. Total budgeted expenses exceeded income by $5,100, the latter largely offset by credits from previous years' operations. The current surplus stands at $516.85.

ENDOWMENT FUNDS

Book Value of the Endowment Funds increased approximately $660,000, to $36,230,000. Capital gifts, principally the Bemis, Upham and Bartlett Funds, total $1,131,500. Withdrawals from funds for new building construction and other projects and purposes account for the net increase indicated above.

INVESTMENTS

Our General Investment List shows a decline of approximately 8 per cent in Bonds, mostly Public Utilities and a corresponding increase in Common Stocks and Mortgages. Government bond holdings are maintained and our real estate holdings are somewhat increased.

SUMMARY OF INVESTMENTS, JUNE 30, 1939

General Investments	*Book Value*	*Market Value*	*Per Cent at Market*
Bonds — U. S. Government	$4,870,000	$4,966,800	14.9
Canadian Government	909,546	969,200	2.9
Industrial	629,142	598,400	1.8
Public Utility	3,275,318	3,549,900	10.7
Railroad	2,944,947	2,457,300	7.4
Other	995,876	875,700	2.6
	$13,624,829	$13,417,300	40.3
Preferred Stocks — Industrial	$787,192	$791,700	2.4
Public Utility	988,195	1,014,300	3.
Railroad	80,024	23,000	...
	$1,855,411	$1,829,000	5.4
Common Stocks — Industrial	$10,525,221	$11,646,600	35.
Public Utility	2,000,007	2,011,000	6.
Railroad	374,390	224,400	.7
Bank	1,776,792	1,243,200	3.7
Insurance	444,379	466,200	1.4
Other	346,662	258,100	.8
	$15,467,451	$15,849,500	47.6
Mortgages	$484,300	$434,300	1.3
Real Estate	1,806,341	1,806,341	5.4
	$2,290,641	$2,240,641	6.7
Total — General Investments	$33,238,332	$33,336,441	100
Total — Special Investments	$2,677,647	$2,368,750	...
(*a*) Total Investments (Schedule H)	$35,915,979	$35,705,191	...

(*a*) Investments of Agency Funds not included (Schedule D).

INVESTMENT INCOME

There was a further reduction in the General Investment Income distributable to the pooled funds. This year the allocation was 4.02 per cent contrasting with 4.55 per cent last year and 5 per cent the year previous. The yield on all investments based on Market Value as of June 30, 1939 was 3.89 per cent (4.45 per cent last year).

TECHNOLOGY LOAN FUND COMMITTEE

Executive Committee
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Sirs:

There is submitted herewith a report of the Technology Loan Fund showing the balance sheet as of June 30, 1939, together with

a statement of receipts and disbursements for the past year. All transactions for the year have been covered by the regular Institute audit.

Respectfully submitted,

TECHNOLOGY LOAN FUND COMMITTEE

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

TECHNOLOGY LOAN FUND — BALANCE SHEET

Assets	*June 30, 1938*		*June 30, 1939*	
Cash	$14,390.90		$5,158.14	
Investments (Schedule H)	957,166.15	$971,557.05	924,520.15	$929,678.29
Student Notes Receivable (Schedule P)				
Loans (1930 to date)	$1,152,967.40		$1,320,140.40	
*Less repayments (1930 to date)	394,317.99	758,649.41	495,953.32	824,187.08
Total Assets		$1,730,206.46		$1,753,865.37
Liabilities				
Total Subscriptions (1930 to date)		$1,435,720.18		$1,435,735.18
Net Profit a/c sales of securities (1930 to date)		24,281.87		7,781.89
Income from Investments (1930 to date) (net)		194,622.69		226,878.66
Interest from Student Loans (1930 to date)		77,809.07		93,037.91
Less: Profit and Loss (deceased borrowers and life ins. premiums)		(2,227.35)		(9,568.27)
Total Fund		$1,730,206.46		$1,753,865.37

* Includes write-off, $2,227.35

RECEIPTS AND EXPENDITURES FOR 1938–1939

Receipts		
Income from Investments (net)	$32,255.97	
Interest from Student Loans	15,228.84	
Gift	15.00	
Total Receipts		$47,499.81
Expenditures		
Loans made during year	$167,173.00	
Less repayments	101,635.33	
		$65,537.67
Net Loss a/c sale of securities	$16,499.98	
John Hancock Mut. Life Ins. Co. Group Life Premium	7,340.92	23,840.90
Total Expenditures		$89,378.57
Net Decrease in Cash and Investments (above)		$41,878.76

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

Assets	*June 30, 1938*	*June 30, 1939*
Cash	$42,476.22	$49,193.89
Investments (Schedule H-1)	1,202,052.09	[1]1,283,741.71
Total	$1,244,528.31	$1,332,935.60

[1] Market Value June 30, 1939, $1,239,500.00.

Liabilities	*June 30, 1938*	*June 30, 1939*
Teachers' Annuity Fund (5% Salary deduction, plus interest)	$679,293.37	$737,393.89
*M. I. T. Pension Fund (3% appropriation, plus interest)	436,087.78	471,865.19
Special Reserves for Annuity Payments	104,966.15	102,038.78
Total Liabilities	$1,220,347.30	$1,311,297.86
Reserve Fund (surplus less Income overdraft)	24,181.01	21,637.74
Total	$1,244,528.31	$1,332,935.60

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

RECEIPTS AND EXPENDITURES FOR 1938–1939

Receipts	
5 per cent Salary deductions added to Teachers' Annuity Fund.	$75,630.79
3 per cent appropriations added to M.I.T. Pension Fund	45,586.05
Income from Investments	46,111.39
Profits of Sales of Securities	8,885.05
Total Receipts	$176,213.28
Expenditures	
Refunded to members withdrawing from M.I.T.	$17,015.35
Used to purchase annuities for retiring members	55,404.88
Pensions paid directly to former retired members	9,994.90
Amortization of Bond Premiums	5,390.86
Total Expenditures	$87,805.99
Net Increase of Ledger Assets	$88,407.29

CHARLES B. BREED
KARL T. COMPTON
HORACE S. FORD
RALPH E. FREEMAN
PHILIP STOCKTON
Trustees.

Respectfully submitted,

HORACE S. FORD,
Treasurer.

August 22, 1939

SCHEDULE A

FINANCIAL RESULT OF OPERATION FOR YEAR ENDED JUNE 30, 1939

	Operating — Budget	*Other — Non-Budget*	*Total*
Total Income and Receipts (Schedule B)	$3,203,335.54	$2,370,272.68	$5,573,608.22
Total Expenditures (Schedule C)	3,208,418.25	1,780,089.60	4,988,507.85
Excess Expense, Budget Operation	$5,082.71		
Excess Income and Receipts, Non-Budget Operation — Added to Funds		$590,183.08	
Net Excess Income and Receipts Total Operation			$585,100.37
Profit and Loss balance from previous years' operation (Schedule S), Gain	4,240.53		
Net Decrease of Current Surplus (Schedule S)	$842.18		

SCHEDULE B

INCOME AND RECEIPTS FOR YEAR 1938–1939

	Operating Income Budget	*Other Income and Receipts Non-Budget*	*Total*
INCOME FROM STUDENTS:			
(*a*) Tuition Fees	$1,791,998.85		
Locker, Examinations and Other Fees	8,153.17		
(*b*) Dormitories (Net), Schedule B-1	39,843.08		
	$1,839,995.10	.....	$1,839,995.10
INCOME FROM INVESTMENTS:			
Total (Schedule M)	$1,126,446.83	$264,957.81	$1,391,404.64
INCOME FROM OTHER SOURCES:			
Federal Aid from Acts, 1862–90	$22,088.35		
Contributions (Schedule B-3)	8,225.00		
Miscellaneous (Schedule B-4)	40,565.69		
Appropriations (Schedule B-5)	166,014.57		
	$236,893.61	.....	$236,893.61
CURRENT FUNDS INCOME:			
Total (Schedule R)	.....	$405,171.02	$405,171.02
ENDOWMENT FUNDS ADDITIONS:			
Total (Schedule M)	.....	$1,700,143.85	$1,700,143.85
TOTALS (Schedule A)	$3,203,335.54	$2,370,272.68	$5,573,608.22

(*a*) TUITION FEES — Cash, Institute Year 1938–39		$1,321,264.83
	Cash, Summer Session 1938	116,867.60
	Fees Receivable	1,704.67
	Accounts Receivable (U. S. Gov't)	1,162.50
	Undergraduate Scholarships	91,834.00
	Graduate Scholarships and Awards	107,566.25
	Technology Loan Fund, Loans	147,199.00
	Emerson Fund, Awards	4,400.00
Total		$1,791,998.85

(*b*) Excluding Graduate House Operation (see Schedule B-2)

SCHEDULE C

EXPENDITURES FOR YEAR 1938–1939

	Operating Expense Budget	*Other Expenditures Non-Budget*	*Total*
ACADEMIC EXPENSES:			
Salaries of Teachers (C-1)	$1,709,727.89		
Accessory to Teaching (C-1)	70,990.97		
Laboratory Service (C-1)	145,381.27		
Department Expenses (C-2)	146,363.20		
General Library (C-3)	69,012.67		
	$2,141,476.00	.....	$2,141,476.00
ADMINISTRATION EXPENSES:			
Salaries, Officers	$113,966.58		
Clerical Staff (C-4)	82,602.19		
Expenses, Offices (C-5)	39,806.56		
Bulletins and Publicity (C-6)	22,637.52		
General Expense (C-7)	102,705.96		
	$361,718.81	.....	$361,718.81
PLANT EXPENSES:			
Building Service (C-8)	$125,123.68		
Power Plant Operation (C-9)	97,819.07		
Fire Insurance (Net)	2,442.59		
Repairs and Alterations (C-10)	120,339.17		
	$345,724.51	.....	$345,724.51
MISCELLANEOUS EXPENSES:			
Department of Hygiene (C-11)	$54,827.05		
Camps 1938 (C-12 and C-13)	6,418.93		
*Undergraduate Budget Board Operations (Schedule C-14)	79,291.34		
Special Appropriations (C-17)	218,961.61		
	$359,498.93	.....	$359,498.93
CURRENT FUNDS; EXPENDITURES:			
Total (Schedule R)	.....	$477,123.94	477,123.94
ENDOWMENT FUNDS; EXPENDITURES:			
Total (Schedule C-18)	.....	1,302,965.66	1,302,965.66
TOTALS (Schedule A)	$3,208,418.25	$1,780,089.60	$4,988,507.85

* Not including Dining Services (see Schedule C-15 and C-16).

SCHEDULE B-1

UNDERGRADUATE DORMITORY OPERATION (Net)

Income:			
Rentals		$152,297.30	
Miscellaneous		1,869.88	
			$154,167.18
Less Refunds	$7,526.44		
Dormitory Tax Allowance	3,022.50		
			10,548.94
			$143,618.24
Expense:			
Salaries		$49,017.31	
Laundry		3,378.69	
Light, Heat, Power and Water		17,786.21	
Repairs		17,873.99	
Supplies (less inventory $2,885.35)		2,496.63	
Printing, Adm., Telephone, etc.		2,617.11	
New furniture and equipment		4,605.22	
Interest on Mortgage Loan (M.I.T.)		6,000.00	
			103,775.16
Net Income, Schedule B			$39,843.08

SCHEDULE B-2

GRADUATE HOUSE OPERATION (Net)

Income:			
Rentals		$68,230.50	
Miscellaneous		2,181.63	
			$70,412.13
Less Refunds		$1,053.50	
Graduate House Tax Allowance		1,732.00	
			2,785.50
			$67,626.63
Expense:			
Salaries		$41,262.04	
Real Estate Tax		13,238.90	
Laundry		1,465.51	
Light, Heat, Power and Water		7,706.53	
Repairs		1,597.90	
Supplies (less inventory $4,163.58)		1,503.18	
Administration, Insurance, etc.		4,282.43	
New Equipment		1,225.19	
Total Operating Expense			$72,281.68
Less — Excess expense charged to General Investment Income			4,655.05
			$67,626.63

SCHEDULE B-3

CONTRIBUTIONS FOR TEACHING AND RESEARCH

L. J. & M. E. Horowitz Foundation for Building Constructing Course	$6,000.00
Mr. and Mrs. William Emerson for City Planning Course	725.00
For Displaced German Scholars for Electrical Engineering	1,000.00
Eddy-Rucker-Nickels Co. for Mathematics	500.00
	$8,225.00

SCHEDULE B-4

MISCELLANEOUS INCOME

From Income Equalization Reserve Fund	$25,000.00
Division of Laboratory Supplies	5,004.17
From Trustees H. C. Frick Estate	3,506.52
Miscellaneous	85.00
General Electric Co. for Course VI-A	3,750.00
Boston Edison Co. for Course VI-A	2,500.00
Anonymous for Chemical Engineering	720.00
	$40,565.69

SCHEDULE B-5

APPROPRIATIONS FROM FUNDS FOR TEACHING AND RESEARCH BY DEPARTMENTS

Aeronautical Engineering				$4,600.00
Bureau of Agri.	$2,600.00	Detonation Res.	2,000.00	
Architecture				1,800.00
City Planning	$1,800.00			
Biology				16,005.00
Genradco	$5,500.00	Health Educ.	405.00	
Sedgwick Fund	7,000.00	Food Research	1,450.00	
E.C. in aid D.F.P.	1,650.00			
Chemistry				17,404.16
Richards Fund	$600.00	A. D. Little Fund	2,137.50	
Chem. Found.	11,000.00	Res. Corp. Vit.		
Solar Energy	3,000.00	A & D	666.66	
Chemical Engineering				6,833.30
Richardson Fund	$2,000.00	Solar Energy	833.30	
A. D. Little Fund	1,500.00	Cabot Fund	2,500.00	
Civil Engineering				2,800.00
Whitney Fund	$2,800.00			
Economics				9,900.00
Indus. Rela. Fund	$9,900.00			
Electrical Engineering				34,068.19
Blind Landing Res.	$2,660.00	Solar Energy	300.00	
Fog Research	1,050.00	Function Unit Res.	1,064.00	
Assoc. Ed.Co.Acct.	7,903.43	Genradco Trust	1,800.00	
Rock.Diff.Analy.	6,100.00	Network Analy.	1,416.32	
Glass Fracture Res.	1,020.00	Rapid Selection	4,234.44	
Hyams Res.	1,820.00	No. 1219	3,500.00	
Arith. Mach. Res.	1,200.00			
English				1,000.00
Teachers Fund	$1,000.00			
Geology				10,500.00
Whitney Fund	$6,000.00	Geol. Soc. of Am.	3,000.00	
242–38 Acct.	700.00	Spectrograph Fund	800.00	
Humanics				5,354.11
Nickerson Fund	$5,354.11			
Library				3,066.50
Vail Fund	$2,400.00	Cilley Fund	666.50	
Mechanical Engineering				12,870.00
Industrial Fund	$5,750.00	Textile Res.	3,750.00	
N. A. W. 567	870.00	1254 Acct.	2,300.00	
Textile Res. School	200.00			
Metallurgy				5,380.00
Penrose Fund	$600.00	No. 1337	3,680.00	
Chilled Iron Res.	1,000.00	Nitralloy Corp.	100.00	
Naval Architecture				1,000.00
Teachers Fund	$1,000.00			
Physics				13,483.31
Age of Earth Res.	$1,800.00	Rockefeller Res.	2,250.00	
Glass Indus.	1,250.00	Nuclear Res.	1,083.31	
Milton Iodine Res.	2,200.00	No. 1288	800.00	
Markle Cyclotron	3,300.00	Solar Energy Res.	800.00	
Research Associates Fund to Various Departments				19,950.00
Total, Schedule B				$166,014.57

SCHEDULE C-1

SALARIES OF TEACHERS, ACCESSORY TO TEACHING AND LABORATORY SERVICE

Department	*Teachers Salaries*	*Wages Accessory to Teaching*	*Wages Laboratory Service*
Summer Session 1938	$72,369.04	.....	.....
Aeronautical Engineering	82,000.00	$3,442.17	$6,312.88
Architecture	63,084.50	5,598.67	1,696.00
Biology and Public Health	63,534.10	1,557.00	2,720.00
Business and Eng. Administration	55,587.81	4,545.97	.....
Chemistry	181,827.56	7,082.52	16,322.20
Chemical Engineering	86,853.30	4,137.00	4,928.80
Chemical Engineering Practice School	13,580.00	.....	.....
Civil Engineering	106,855.33	4,088.26	4,658.42
Division of Laboratory Supplies	.....	.....	22,808.12
Drawing	24,350.00	684.00	.....
Economics	53,950.00	2,940.00	.....
Electrical Engineering	184,606.19	9,509.97	17,318.00
English and History	58,350.00	1,006.97	.....
Gen. Eng. and General Science	1,500.00	1,200.00	.....
General Studies	2,150.00	*.....	.....
Geology	56,750.00	2,254.17	2,445.95
Humanics	5,000.00	*.....	.....
Lantern Operation	.....	.....	1,716.47
Mathematics	67,400.00	985.00	.....
Mechanical Engineering	198,570.00	8,628.13	21,524.04
Metallurgy	76,380.00	2,340.00	8,470.21
Military Science	7,570.00	1,153.34	.....
Mining	30,240.50	2,658.51	.....
Modern Languages	18,200.00	311.75	.....
Naval Architecture	41,525.00	1,593.68	1,893.80
Physics	157,494.56	5,273.86	32,566.38
Totals (Schedule G)	$1,709,727.89	$70,990.97	$145,381.27

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

SCHEDULE C-2

DEPARTMENT EXPENSES (Net)

Department	
Aeronautics	* $5,000.00
Architecture	* 7,583.72
Biology	* 3,277.66
Business and Engineering Administration	5,152.49
Chemistry	18,200.00
Chemical Engineering	* 8,900.00
Chemical Engineering Practice School	8,356.43
Civil Engineering	* 4,361.93
Drawing	423.09
Economics	1,698.50
Electrical Engineering	* 18,950.00
English and History	427.55
General Engineering and General Science	94.96
General Studies	229.24
Geology	* 3,000.00
Humanics	354.11
Mathematics	* 745.00
Mechanical Engineering	* 17,400.00
Metallurgy	* 5,064.00
Military Science	1,497.47
Mining	2,000.00
Modern Languages	297.43
Naval Architecture	878.94
Physics	* 32,000.00
United States Army and Navy Officers	470.68
Total (Schedule C)	$146,363.20

SCHEDULE C-3

GENERAL LIBRARY

Salaries of Officers	$14,794.00
Wages, Office and Clerical	35,839.86
Expenses	* 18,378.81
Total (Schedule C)	$69,012.67

* Certain special appropriations not included (see Schedule C-17).

SCHEDULE C-4

WAGES, CLERICAL STAFF, ADMINISTRATION OFFICES

President	$5,962.75
Dean of Engineering	974.98
Dean of Science	1,038.00
Dean of Students	2,040.00
Registrar	26,389.04
Director of Admissions	10,295.02
Treasurer and Bursar	20,652.98
Superintendent	8,220.40
*News Service	1,044.20
Undergraduate Scholarship and Loan Fund Board	5,984.82
Total (Schedule C)	$82,602.19

SCHEDULE C-5

EXPENSES, ADMINISTRATION OFFICES

President	$2,730.02
Dean of Engineering	318.72
Dean of Science	138.09
Dean of Students	625.02
Registrar	10,950.95
Director of Admissions	3,529.79
Bursar	5,743.12
Treasurer	2,080.94
Superintendent	2,028.65
*Register of Former Students	4,235.46
News Service	1,206.56
Undergraduate Scholarship and Loan Fund Board	3,764.48
Graduate School and Scholarship Committee	357.23
New Student Publicity Account	2,097.53
Total (Schedule C)	$39,806.56

SCHEDULE C-6

BULLETINS AND PUBLICITY

Printing — President's and Treasurer's Reports	$1,277.00	
Directory	845.00	
Summer Session 1939	3,127.13	
General Catalogue	7,873.43	
		$13,122.56
Publicity:		
Honoraria	$1,000.00	
Tech Review to Schools and Clubs	2,060.00	
Alumni Day	1,000.00	
Research Reports	1,634.04	
Summer Session 1938	354.46	
Spectroscopy Conference	2,000.00	
News Bulletin in Review	655.00	
President's Letter	811.46	
		9,514.96
Total (Schedule C)		$22,637.52

* Certain special appropriations not included (see Schedule C–17).

SCHEDULE C-7
GENERAL EXPENSE

Allowances	$19,500.00
Pensions	15,640.00
Workmen's Compensation and General Liability Insurance, etc.	7,164.87
Taxes, Cambridge	7,662.58
Auditing	1,700.00
Dues, Fees, etc.	3,367.56
Receptions, Graduation	7,653.04
Trucking of Mail	1,027.43
Travel	9,117.45
Telephone Service	25,147.69
Graduate House Dining Service Deficit	2,609.73
M. I. T. Service Accounts (Net)	2,115.61
Total (Schedule C)	$102,705.96

SCHEDULE C-8
BUILDING SERVICE

Shop Foreman (net)	$3,243.37
Janitors: Supervisory and Staff	42,049.07
Night Cleaners	36,628.70
Watchmen (including Cambridge Police)	12,818.69
Window Cleaning	8,100.02
Heating and Ventilation	10,321.73
Mail, Elevators, Shipper, Stock Room, Matron, Messenger	11,962.10
Total (Schedule C)	$125,123.68

SCHEDULE C-9
POWER PLANT OPERATION

Fuel Oil	$47,039.28
Cambridge Electric Light Co., Power	48,008.24
Water	1,891.10
Supplies	2,493.67
Repairs	6,462.83
Salaries	18,149.15
Total	$124,044.27
Less Transfers and Credits	26,225.20
Total (Schedule C)	$97,819.07

SCHEDULE C-10

REPAIRS, ALTERATIONS AND MAINTENANCE

Buildings 1, 2, 3, 4, 5, 6, 7, 8, 10, 11	$49,045.67
Buildings No. 30, 31, 33, 35, 36, 38, 46 and all others	5,896.16
President's House	6,415.11
Furniture	4,308.58
Elevators	2,718.68
Mains and Conduits	9,896.69
Water	8,727.83
Gas	2,215.06
Grounds, Roads, Tennis Courts, etc.	26,134.19
Building Protection	1,508.89
Rubbish	2,440.73
Undistributed (net)	1,031.58
Total (Schedule C)	$120,339.17

SCHEDULE C-11

DEPARTMENT OF HYGIENE

Salaries, Staff		$21,350.00
Expense, Clinic:		
Salaries	$8,513.22	
Medical and Other Supplies	2,360.61	
Office Supplies	228.56	
X-Ray Operation	2,488.68	
Repairs	193.41	
Physical Examinations	3,993.85	
		17,778.33
Expense, Infirmary:		
Salaries	$8,720.25	
Extra Nursing	2,009.50	
Equipment	1,256.01	
Food (net)	1,253.96	
Laundry	2,302.01	
		15,541.73
Miscellaneous		156.99
Total (Schedule C)		$54,827.05

SCHEDULE C-12

CIVIL ENGINEERING SUMMER CAMP (1938)
TECHNOLOGY, MAINE

*Income from Students, Staff and miscellaneous ...		$3,761.55	
**Expense:*			
Caretaker	$1,440.00		
Repairs and Equipment	1,475.18		
Administration Taxes, Insurance, Travel	2,428.48		
Wages, Provisions and Supplies, Operating	3,646.06		
		8,989.72	
Net Expense			$5,228.17

SCHEDULE C-13

MINING ENGINEERING SUMMER CAMP (1938)

*Income from Students and Staff		$527.08	
**Expense:*			
Administration, Repairs and Equipment	$830.76		
Caretaker	360.00		
Provisions and Supplies, Operating	527.08		
		1,717.84	
Net Expense			1,190.76
Total Expense of Camps (Schedule C)			$6,418.93

SCHEDULE C-14

UNDERGRADUATE BUDGET BOARD OPERATIONS

Sailing Pavilion and Activities	$5,837.70
Boathouse, Maintenance	5,504.68
Launches, Maintenance	2,090.05
Athletic Field, Maintenance	8,646.68
Walker Memorial (excluding Dining Service) (Net)	18,776.15
Undergraduate Dues	21,126.00
Athletic Coaches Salaries	15,500.00
Publicity — Undergraduate Publications	815.75
Administration Expense	469.33
Musical Clubs	525.00
	$79,291.34

* Tuition Receipts and Staff Salary Payments included in Summer Session, pp. 151 and 156.

SCHEDULE C-15

WALKER DINING SERVICE

Inventory, June 30, 1938		$7,857.81
Expenses:		
Food	$80,614.89	
Salaries	48,306.79	
Light, Heat, Power, Water	3,965.55	
Laundry	3,063.63	
Equipment	1,805.15	
Repairs	1,198.05	
Printing, Administration, Insurance	3,552.27	
Occupancy	2,500.00	
Carried to Dining Service Reserve	3,054.95	
		148,061.28
Total Expense		$155,919.09
Income		$149,470.69
Sale of Coupon Books (Net)	$78,718.60	
Cash	70,752.09	
Inventory, June 30, 1939		6,448.40
		$155,919.09

SCHEDULE C-16

GRADUATE HOUSE DINING SERVICE

Expenses:		
Food	$34,091.94	
Salaries	21,140.13	
Light, Heat, Power, Water	1,083.07	
Laundry	1,224.53	
Equipment	7,043.37	
Repairs	666.57	
Administration	1,379.58	
		$66,629.19
Income:		
Cash	$57,297.33	
From General Expense to Balance	2,609.73	
		$59,907.06
Inventory, June 30, 1939		6,722.13
		$66,629.19

SCHEDULE C-17

SPECIAL APPROPRIATIONS

Staff Tuition Awards		$34,875.00
Pension and Insurance Plan — Staff		75,833.14
Annuity and Insurance Plans — Employees		36,371.63
Society of Arts		2,227.29
President's Fund		1,500.00
Nos. 1479, 1438 and 1531 Honoraria		4,050.00
New Equipment		2,000.54
Museum Committee		7,700.00
Paper Museum		7,500.00
No. 1496 New York World Fair Exhibit		1,200.00
No. 1463 Foreign Student Contribution		693.00
No. 1454 Visiting Committee Reports		300.00
New Register of Former Students		2,000.00
News Service Assistant		125.00
Aeronautical Engineering		2,843.53
Shop Course	400.00	
Hurricane Research	1,500.00	
Flying Instruction	493.53	
No. 1447 Drafting Tables	450.00	
Architecture		2,395.28
Special No. 1455 Reception.		
Biology and Public Health		5,700.00
Food Research	2,200.00	
Biological Engineering	2,000.00	
Vitamin Research	1,500.00	
Chemical Engineering		2,300.00
1449 Mechanic and Secretarial Services.		

SCHEDULE C-17 — (*Continued*)
SPECIAL APPROPRIATIONS

Civil Engineering		$3,750.00
Soil Mechanics Laboratory	1,000.00	
Structural Laboratory	1,200.00	
Cement Research	1,250.00	
River Hydraulic Laboratory	300.00	
Electrical Engineering		11,524.02
No. 1434	500.00	
Course VI-A Travel	1,000.00	
Diff. Analyzer	3,524.02	
No. 1450 Sound Proofing	2,000.00	
1435 Radio Survey Research	500.00	
von Hippel Research	4,000.00	
Geology		900.00
No. 1451 Microscope		
Library		1,228.18
No. 1445 Bus. and Eng. and Economics Library		
Mathematics		1,390.00
No. 1474 Journal of Mathematics	800.00	
No. 1506 Computing Machines	590.00	
Mechanical Engineering		3,500.00
No. 1525 de Forest Research	1,000.00	
Int. Cong. App. Mechanics	1,500.00	
Vibration Research	500.00	
1412 Moving Expense (Staff)	500.00	
Metallurgy		6,655.00
Magnetic Research	3,480.00	
Chipman Research	1,675.00	
No. 1480 Evaporating Vacuum Tank—Wulff	1,500.00	
Physics		400.00
1493 Cyclotron		
TOTAL SPECIAL APPROPRIATIONS (Schedule C)		$218,961.61

SCHEDULE C-18

[1] ENDOWMENT FUNDS, EXPENDITURES

General, Restricted		$85,388.92
Eben S. Draper, for Expenses	948.00	
Eastman Building Fund, for New Construction	[2]*43,616.95*	
M.I.T. Alumni Fund, for New Construction	122,000.00	
Edwin A. Wyeth, for Annuity, Taxes, and Expenses	6,057.87	
General, Unrestricted		97,991.74
Stephen L. Bartlett, for Research, etc.	25,008.12	
Frederick W. Emery, Taxes, etc.	250.00	
Pierre du Pont, for Research	20,000.00	
George Wyman Hamilton, for Equipment	133.85	
James W. Henry, for Equipment and Research	8,398.79	
Abby W. Hunt, for Equipment	4,000.00	
Industrial, for Research and Placement Bureau	26,737.99	
H. H. Logan, for Equipment	5,622.21	
Emerette O. Patch, for Equip. and N.Y. Exhibit	3,000.00	
Charles O. Prescott, for Equipment	4,840.78	
Special Deposit and Agency Funds		585,733.33
[3]Endowment Reserve, for care, losses, and premium amortization account of securities	486,787.91	
Income Equalization Reserve, for Current Income	25,000.00	
Albert, for Student House Expense	1,885.85	
Class Funds ('23–'26) for Ins. Premiums, etc.	608.94	
Industrial Relations, for Research	23,000.00	
M. I. T. Teachers Ins. for Ins. Premiums, etc.	29,230.40	
M. I. T. Teachers Ins. Special, for Annuities	6,612.88	
M. I. T. Employees Fund, for Relief	522.86	
Schwarz Memorial, for Map Room	54.37	
Lillie C. Smith, for Student Aid	46.05	
Technology Matrons Teas, for Teas	400.40	
Undergraduate Pub. Trust, for Expense	1,400.00	
Ednah Dow Cheney, for Margaret Cheney Room	183.67	
Cosmic Terrestrial Research, for Research	10,000.00	
Library Funds		8,700.76
Walter S. Barker, for Books	1,067.46	
Frank Harvey Cilley, for Walker Library	3,966.50	
Charles Lewis Flint, for Books	143.37	
William Hall Kerr, for Books	71.73	
George A. Osborne, for Books	340.19	
Arthur Rotch Architectural, for Books	610.10	
John Hume Tod, for Books	101.41	
Theodore N. Vail, for Vail Library	2,400.00	

[1] Other than Transfer of Income for Current Purposes.
[2] Credit—Net return to fund account of new architectural building and Wright Memorial Wind Tunnel construction costs.
Gross gains a/c sales of securities $301,908.35 (page 182).

SCHEDULE C-18 — (*Continued*)

[1] ENDOWMENT FUNDS, EXPENDITURES

Department Funds		$21,538.49
Frank Walter Boles Memorial, for Arch	$522.79	
A. D. Little Memorial (Trans. of Income)	1,873.32	
Metallurgy, for Research	1,020.00	
Forris Jewett Moore, for Chemistry	[2]*458.54*	
William E. Nickerson, for Humanics	5,354.11	
Pratt Naval Arch., for Nautical Museum and Annuities	2,653.97	
W. T. Sedgwick, for Biology	7,000.00	
Edmund K. Turner, for Annuity and Taxes	2,072.84	
William Lyman Underwood, for Biology	1,500.00	
Research Funds		124,811.53
Albert Farwell Bemis, for Research and Expenses	17,199.73	
Samuel Cabot, for Chemical Engineering	2,500.00	
Ellen H. Richards, for Chemistry	630.16	
Charlotte B. Richardson, for Chem. Eng.	2,000.00	
Solar Energy, for Research	16,683.30	
Edward Whitney, for Civ. Eng. & Geology	8,800.00	
Textile Research, for M. E. Dept.	4,750.00	
Wright Memorial Wind Tunnel, for New Construction	72,248.34	
Fellowship Funds		12,534.00
For Fellowships	9,950.00	
For Expenses	2,584.00	
Scholarship Funds		69,420.98
For Scholarships and Loans	69,374.00	
For Expenses	46.98	
Prize Funds		753.50
For Prizes	753.50	
Relief Funds		296,092.41
Edward Austin, for Graduate Scholarships	22,500.00	
Miscellaneous Funds, for Undergraduate Sch.	22,360.00	
Jonathan Whitney, for Graduate Scholarships	35,342.25	
Jonathan Whitney, for T. C. A.	1,500.00	
Jonathan Whitney, for Expenses	4,659.40	
Tech Loan Fund, for Loans and Expense	193,061.76	
Coffin Memorial, for Expenses	101.00	
J. A. Grimmons, for Elec. Eng.	3,300.00	
Frances and William Emerson, for Student Aid.	4,400.00	
Deans, for Student Loans and Award	1,460.00	
Bursar's, for Student Loans	1,175.00	
W. B. Rogers, for Special Awards	1,800.00	
Teachers Fund, for Retiring Allowances	4,433.00	
Total (Schedule C)		$1,302,965.66

[1] Other than Transfer of Income for Current Purposes
[2] Credit — Adjustment 1937–38 account.

SCHEDULE D
TREASURER'S BALANCE SHEET
JUNE 30, 1939

ENDOWMENT FUNDS, ASSETS

Securities and Real Estate (Schedule H)	$35,915,978.63
Cash: For Investment (Schedule D-4)	313,996.85
Total	$36,229,975.48

STUDENT LOAN ASSETS

Notes Receivable (Schedule P)	$852,338.98
Total	$852,338.98

CURRENT ASSETS

Cash: For General Purposes (Schedule D-4)	$106,858.92
Accounts Receivable (Schedule D-1)	80,197.18
Students' Fees and Deposits, Receivable	1,805.51
Deposit on Fire Insurance Account	45,083.25
Advances and Inventories for 1939–40 (Schedule D-2)	108,017.78
Advances, Research in Progress (Schedule D-3)	18,923.30
Total	$360,885.94

EDUCATIONAL PLANT ASSETS

Land, Buildings and Equipment (Schedule J)	$15,996,465.10
Cash: for New Construction (Schedule D-4)	4,524.52
Total	$16,000,989.62

Total Assets	$53,444,190.02

AGENCY FUNDS, ASSETS

Securities, Hewett Fund (Schedule H-1)	$207,413.67
Cash: Hewett Fund	2,484.78
Securities, M. I. T. Pension Association (Schedule H-1)	1,283,741.71
Cash: M. I. T. Pension Association	49,193.89
Securities, George S. Witmer Fund (Schedule H-1)	30,000.00
[1]Cash: Student Deposits	32,128.44
	$1,604,962.49

[1]Held for safekeeping only.

SCHEDULE D
TREASURER'S BALANCE SHEET
JUNE 30, 1939

ENDOWMENT FUNDS, CAPITAL

Endowment Funds (Schedule M)	$36,229,975.48
Total	$36,229,975.48

STUDENT LOAN CAPITAL

Total (Schedule P)	$852,338.98
Total	$852,338.98

CURRENT LIABILITIES

Current Funds (Schedule R)	$254,932.78
Accounts Payable	5,263.28
Students' Fees and Deposits (Schedule D-5)	97,228.35
Civil Engineering Camp 1939	2,944.68
Current Surplus (Schedule S)	516.85
Total	$360,885.94

EDUCATIONAL PLANT CAPITAL

Endowment for Educational Plant	$16,000,989.62
Total (Schedule K)	$16,000,989.62

Total Capital and Liabilities	$53,444,190.02

AGENCY FUNDS, CAPITAL

Joseph Hewett Fund	$209,898.45
M. I. T. Pension Association (see page 8)	1,332,935.60
George S. Witmer Fund	30,000.00
[1]Student Deposits	32,128.44
	$1,604,962.49

[1] Held for safekeeping only.

SCHEDULE D-1

DETAIL OF ACCOUNTS RECEIVABLE

Chemical Foundation, a/c Div. Ind. Coöperation	$18,000.00
Chemical Foundation, a/c Cellulose Research	39,376.20
Utilities Coördinated Research, A. E. I. C. Research	3,833.80
General Electric Company, Course VI-A	3,750.00
U. S. Government, Tuitions	1,162.50
Division of Industrial Coöperation Accounts	9,765.73
Miscellaneous Accounts	4,308.95
Total (Schedule D)	$80,197.18

SCHEDULE D-2

DETAIL OF ADVANCES AND INVENTORIES FOR 1939–1940

Summer Session Salaries and Expenses Advanced	$6,465.07
Salaries Advanced, 1939–40	1,848.00
Civil Engineering Summer Camp 1939, Advanced	8,081.03
Carnegie Foundation Pension Account	4,350.29
Sloan Fellowships 1939–40	5,759.46
Department Overdrafts	991.73
Premiums Paid on Unexpired Insurance	5,185.83
President's Fund Overdraft	521.75
Cash Register Advances — Walker Dining Service	100.00
Graduate House (Dining Service)	80.00
Graduate House (Operation)	80.00
Walker Games Department	60.00
Inventories — Notes held by Coöperative Society and M.I.T.	2,512.30
Dormitory Supplies	2,885.35
Walker Dining Service, Food, Utensils	6,348.40
Fuel Oil	1,475.28
Graduate House Dining Service, Food and Utensils	6,642.13
Graduate House Supplies	4,163.58
Walker Memorial Games, Candy, Cigars	323.21
Letter Shop Supplies	464.93
Postage Stamps	295.68
Building and Janitors' Supplies	2,160.87
Stock Room: Pipe, Fittings, Lumber, Hardware, Paint, Oil, Glass and Miscellaneous Supplies	13,161.79
Photographic Service, Supplies	1,750.00
Division of Laboratory Supplies: Chemicals, Glassware, Platinum, etc., also Office Supplies	32,256.51
Civil Engineering Camp Supplies	54.59
Total (Schedule D)	$108,017.78

SCHEDULE D-3

RESEARCH IN PROGRESS

Aeronautical Engineering — Bur. of Agri. Research	$694.07
Aeronautical Engineering — Spec. 500-762. Acct.	598.62
Electrical Engineering — Blind Landing Research	11,828.17
Hyams X-ray Research	477.42
Hyams Radiation Project	3.92
Mechanical Engineering — N. A. W. No. 550	653.04
Mechanical Engineering — N. A. W. No. 563	1,232.94
Mechanical Engineering — N. A. W. No. 566	819.73
Mechanical Engineering — N. A. W. No. 567	1,523.20
Nuclear Research	739.96
Special Appro. No. 1546	161.86
Special Appro. No. 1547	26.22
Special Appro. No. 1548	164.15
	$18,923.30

SCHEDULE D-4

[1]TOTAL CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR

Total Cash Receipts	$11,265,121.17
Total Cash Disbursements	12,024,740.73
Excess of Disbursements	$759,619.56
Cash, June 30, 1938	1,184,999.85
Cash, June 30, 1939 (as below)	$425,380.29

[1]CASH BALANCE

Cash for Investment — on Deposit (Schedule D)		$313,996.85
Cash for New Construction — on Deposit (Schedule D)		4,524.52
Cash for Current Purposes (Schedule D)		
On Deposit	$104,760.66	
In Office	2,098.26	
		106,858.92
Total Cash		$425,380.29

SCHEDULE D-5

STUDENTS' FEES IN ADVANCE, AND DEPOSITS RETURNABLE

Tuition Fees, 1939–40	$300.00
Tuition Fees, Summer Session 1939	75,867.25
Students' Deposits Returnable	4,841.62
Students' Deposits, Summer Session 1939	6,455.13
Dormitory Rentals, Summer Session 1939	4,732.00
Graduate House Rentals, Summer Session, 1939	5,032.35
Total (Schedule D)	$97,228.35

[1] Exclusive of Agency Funds.

SCHEDULE H

INVESTMENTS — GENERAL

Par Value				*Book Value*	*Net Income*
	U. S. GOVERNMENT BONDS				
$ 500,000	U. S. Treasury	1¾s	1942	$516,000.00	$1,728.25
1,000,000	U. S. Treasury	3¼s	1941	1,050 000.00	32,500.00
1,000,000	U. S. Treasury	3¼s	1945–43	1 060,000.00	32,500.00
750,000	U. S. Treasury	3⅜s	1943–40	773,000.00	25,312.50
1,000,000	U. S. Treasury	3⅜s	1943–41	1,047,000.00	33,750.00
400,000	U. S. Treasury	3⅜s	1947–43	424,000.00	13,500.00
	Income from bonds sold or matured				9,902.03
Total U. S. Government Bonds				$4,870,000.00	$149,192.78
	CANADIAN GOVERNMENT BONDS				
$250,000	Canada	2¼s	1944	$249,322.50	$5,625.00
220,000	Canada	5s	1952	218,740.82	11,000.00
100,000	Montreal	4¼s	1941	100,875.00	861.81
150,000	Ontario	5s	1942	150,000.00	7,500.00
50,000	Ontario	6s	1943	50,500.00	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
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
	Income from bonds matured				30.00
Total Canadian Government Bonds				$909,546.37	$35,050.13
	INDUSTRIAL BONDS				
$50,000	American Radiator	4½s	1947	$48,000.00	$2,250.00
43,000	Anaconda Copper	4½s	1950	42,445.74	1,933.00
150,000	Eastern Gas and Fuel	4s	1956	142,875.00	6,000.00
197,000	National Dairy	3¾s	1951	198,990.90	7,387.50
17,000	Smith & Wesson	5½s	1948	16,830.00	935.00
180,000	United States Steel	3¼s	1948	180,000.00	5,850.00
	Income from bonds sold or called				5,574.72
Total Industrial Bonds				$629,141.64	$29,930.22
Shares	INDUSTRIAL PREFERRED STOCKS				
1,225	American Sugar, Cum. Pfd.			$124,049.50	$4,900.00
500	American Tobacco, Pfd.			69,405.80	3,000.00
500	Bausch & Lomb, Cum. Conv. Pfd.			50,000.00	2,500.00
1,000	duPont de Nemours, Cum. Deb.			130,226.50	6,000.00
1,500	General Motors, Pfd.			181,251.37	7,500.00
500	Liggett & Myers, Pfd.			82,246.24	3,500.00
466	A. D. Little Inc., Pfd.			46,600.00	2,796.00
1,000	U. S. Steel, Pfd.			103,412.85	7,000.00
	Income from stocks sold				8,500.00
	Total Industrial Preferred Stocks			$787,192.26	$45,696.00

Schedule H (*Continued*)

Shares		*Book Value*	*Net Income*
	INDUSTRIAL COMMON STOCKS		
5,500	Air Reduction	$235,099.17	$6,875.00
250	Algonquin Printing	67,500.00	1,000.00
1,700	Allied Chemical and Dye	302,480.66	10,200.00
2,320	American Can	244,088.47	9,200.00
1,095	Anaconda Copper	30,294.00	808.75
1,000	Beechnut Packing	85,876.05	6,475.00
3,000	Borden	67,775.35	2,600.00
6,000	Borg Warner	216,251.72	3,000.00
2,000	Caterpillar Tractor	92,194.13	4,000.00
6,000	Central Aguirre Associates	158,208.85	9,000.00
500	Chrysler	30,087.63	2,000.00
2,700	Continental Can	144,344.59	5,400.00
2,500	Dow Chemical	328,661.71	5,700.00
2,200	Draper Corp.	101,780.20	8,758.75
2,644	du Pont de Nemours	317,526.04	8,709.00
19,000	Eastman Kodak	1,668,051.13	115,500.00
10,775	General Electric	245,891.60	7,360.00
5,176	General Motors	181,138.96	12,940.00
400	Hazel Atlas Glass	43,192.27	.....
3,000	Hecker Products	34,729.00	400.00
7,500	Humble Oil & Refining	486,789.80	7,000.00
2,500	Inland Steel	276,325.32	5,000.00
625	International Business Machines	89,865.24	2,287.50
3,100	International Harvester	123,863.98	5,270.00
10,000	International Nickel, Canada	404,397.44	12,411.75
712	Island Creek Coal	13,528.00	.....
1,000	Johns Manville	127,451.87	500.00
7,000	Kennecott Copper	302,827.04	4,750.00
1,500	Libbey-Owens-Ford	104,047.84	2,625.00
1,000	Minneapolis-Honeywell	27,250.57	1,750.00
2,522	Monsanto Chemical	162,791.44	5,044.00
1,700	Montgomery Ward	106,518.64	2,125.00
6,000	National Biscuit	187,106.54	9,600.00
2,000	National Lead	65,726.17	1,000.00
3,000	National Steel	230,901.41	3,900.00
2,000	Owens Illinois Glass	133,706.48	.....
2,500	J. C. Penney	225,238.84	10,000.00
2,500	Pittsburgh Plate Glass	117,865.55	5,625.00
4,553	Procter & Gamble	200,002.46	10,945.31
2,012	Pullman	128,025.84	2,250.38
4,500	St. Joseph Lead	204,159.79	1,875.00
4,000	Sears Roebuck	307,386.51	7,950.00
1,000	Sherwin Williams	100,988.10	2,000.00
2½	Simpson's Spring	1,000.00	.....
4,000	Standard Oil, Cal.	137,724.21	5,200.00
11,099	Standard Oil, N. J.	506,247.03	7,439.50
1,321	Texas Corp.	46,442.34	2,000.00
1,500	Timken Roller Bearing	106,312.70	1,500.00
6,000	Union Carbide & Carbon	348,182.66	7,165.00

Schedule H (*Continued*)

Shares				*Book Value*	*Net Income*
	INDUSTRIAL COMMON STOCKS (*Continued*)				
2,000	United Carbon			$137,565.94	$6,000.00
6,100	United Fruit			274,252.80	19,600.00
3,560	United Shoe Machinery			245,556.58	14,000.00
	Income from stocks written off				1,950.00
	Total Industrial Common Stocks			$10,525,220.66	$388,689.94
Par Value					
	PUBLIC UTILITY BONDS				
$200,000	Alabama Power	5s	1946	$191,501.25	$10,000.00
100,000	Arkansas Power & Light	5s	1956	101,000.00	5,000.00
150,000	Bell Tel. of Penn	5s	1948	160,000.00	7,500.00
290,000	Cedars Rapids Mfg.& Pr.	5s	1953	276,853.85	14,500.00
100,000	Columbia Gas & Elec.	5s	1952	95,914.50	5,000.00
33,000	Conn. Light & Power	7s	1951	31,080.57	2,310.00
100,000	Cons. Edison, N. Y.	3¼s	1946	101,000.00	3,250.00
94,000	Dayton Pr. & Lt.	3½s	1960	95,800.00	3,290.00
100,000	Detroit Edison, D.	4½s	1961	100,000.00	4,500.00
50,000	Gatineau Power	3¾s	1969	49,125.00	*192.71*
104,000	Georgia Power	5s	1967	91,803.41	5,078.33
50,000	Jersey Central Pr. & Lt.	5s	1947	50,750.00	2,500.00
100,000	Memphis Pr. & Lt.	5s	1948	94,720.49	5,000.00
107,000	Miss. River Power	5s	1951	99,621.70	5,350.00
100,000	N. E. Power Assoc.	5s	1948	94,750.00	944.44
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
80,000	North American	3½s	1949	81,000.00	*38.00*
100,000	North Boston Ltg.	3½s	1947	100,000.00	3,500.00
$100,000	Penn. Power & Light	4½s	1981	96,250.00	4,500.00
75,000	Providence Gas	4s	1963	74,437.50	3,000.00
200,000	Shawinigan Water & Pr.	4½s	1967	202,000.00	9,000.00
50,000	Sierra Pacific Pr.	5½s	1957	44,875.00	2,750.00
60,000	Southern Cal. Edison	3¾s	1945	59,812.50	2,250.00
100,000	Southeastern Pr. & Lt.	6s	2025	104,000.00	*256.15*
100,000	Southern Cal. Gas	4½s	1961	89,250.00	4,500.00
50,000	Syracuse Lighting	5s	1951	53,000.00	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	181,000.00	8,750.00
100,000	West Penn. Power	5s	1963	93,482.50	5,000.00
100,000	Western Mass.	3¼s	1946	100,500.00	3,250.00
	Income from bonds sold, called or matured				90,348.29
	Total Public Utility Bonds			$3,275,317.64	$230,084.20

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

Schedule H (*Continued*)

Shares				*Book Value*	*Net Income*
	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	9,000.00
2,500	Public Service N. J., 5%, Pfd.			254,816.98	12,500.00
191	Railway & Lgt. Sec., Pfd.			16,064.00	1,146.00
3,000	United Corp., Pref.			139,276.75	5,250.00
900	West Penn. Power, 6%, Pfd.			90,934.90	5,400.00
	Total Public Utility Preferred Stocks			$988,195.25	$48,296.00
	PUBLIC UTILITY COMMON STOCKS				
5,000	Am. Gas & Elec.			$203,626.96	$2,000.00
5,000	American Tel. & Tel.			649,627.24	34,002.00
3,100	Boston Edison			447,958.55	17,752.00
10,000	Commonwealth Edison			285,340.24	9,562.50
1,500	Cons. Gas, El. Lgt. & Pr. Balt.			132,250.73	5,400.00
1,700	Detroit Edison			251,695.77	14,900.00
1,000	Stone & Webster			29,507.65	.....
	Total Public Utility Common Stocks			$2,000,007.14	$83,616.50
Par Value	RAILROAD BONDS				
$100,000	Albany & Susquehanna	3½s	1946	$70,000.00	$3,500.00
100,000	Atch. Top. & Santa Fe	4½s	1948	106,000.00	4,500.00
100,000	Atch.Top.& Santa Fe C&A	4½s	1962	99,956.25	4,500.00
150,000	Atch. Top. & Santa Fe	4s	1995	148,970.00	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	Conadian 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	59,000.00	2,950.00
100,000	Chic.J.Rwys.&Un.Stk.Yds.	4s	1940	94,250.00	4,000.00
75,000	Chic.J.Rwys.&Un.Stk.Yds.	5s	1940	74,143.75	3,750.00
100,000	Chicago & N. W.	4s	1987	96,500.00	.....
100,000	Chicago Union Sta.	3¾s	1963	104,000.00	3,750.00
100,000	Missouri Pacific	5s	1977	99,750.00	.....
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	193,000.00	10,920.00
100,000	Oreg. R.R. & Navigation	4s	1946	99,410.83	4,000.00
100,000	Pennsylvania	4½s	1960	114,600.00	4,500.00
100,000	Pennsylvania	4½s	1965	100,500.00	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

Schedule H (*Continued*)

Par Value				*Book Value*	*Net Income*
	RAILROAD BONDS (*Continued*)				
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	100,000.00	4,000.00
75,000	Washington Term.....	3½s	1945	68,196.37	2,625.00
100,000	Washington Term.....	4s	1945	107,300.00	755.56
	Income from bonds sold or called				9,616.67
	Total Railroad Bonds.....			$2,944,947.42	$124,982.23
Shares	RAILROAD PREFERRED STOCKS				
1,000	Pere Marquette, Pr. Pref.....			$80,024.40	.....
	Total Railroad Preferred Stocks.....			$80,024.40	.....
	RAILROAD COMMON STOCKS				
800	Atch. Top. & S. Fe.....			$110,175.00	.....
2,000	Chesapeake & Ohio.....			97,840.60	$3,000.00
400	Norfolk & Western.....			58,542.78	3,625.00
800	Union Pacific.....			107,831.90	4,800.00
	Total Railroad Common Stocks.....			$374,390.28	$11,425.00
Par Value	OTHER BONDS				
$200,000	Adams Express.....	4¼s	1946	$199,388.81	$8,500.00
100,000	Aldred Invest. Trust....	4½s	1967	108,000.00	4,500.00
47,000	Equit. Office Bldg.....	5s	1952	47,000.00	2,350.00
252,000	Gen. Motors Acc. Corp..	3s	1946	256,000.00	7,560.00
100,000	Lawyers Mtge. Inv. Corp.	5½s	1940	99,705.89	3,000.00
200,000	Niagara Shares Corp. ...	5½s	1950	195,780.81	11,000.00
70,000	Railway Express Agency	1s	1940	70,000.00	295.80
20,000	Railway Express Agency	⅞s	1940	20,000.00	74.00
	Income from bonds, sold, called or matured				5,051.60
	Total Other Bonds.....			$995,875.51	$42,331.40
Shares	BANK STOCKS				
2,600	Bankers Trust, N. Y.....			$162,550.00	$5,000.00
1,600	Central Hanover Bk. & Tr., N. Y....			194,225.00	6,000.00
5,000	Chase National, N. Y.....			261,212.50	7,000.00
2,700	Chemical Bank & Trust, N. Y.....			177,343.75	4,500.00
4,891	First National, Boston.....			295,984.96	9,644.00
80	First National, N. Y.....			172,170.60	8,000.00
725	Guaranty Trust, N. Y.....			239,093.04	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
	Total Bank Stocks.....			$1,776,792.35	$56,544.00

Schedule H (*Continued*)

Shares		*Book Value*	*Net Income*
	INSURANCE STOCKS		
275	Boston	$180,786.00	$3,465.00
2,500	Hartford	156,168.76	5,000.00
1,500	Phoenix	107,424.50	3,750.00
	Total Insurance Stocks	$444,379.26	$12,215.00
	OTHER STOCKS		
680	Boston R. E. Trust	$71,661.64	$1,190.00
100	Christiana Securities	250,000.00	8,800.00
200	Christiana Sècurities, Pfd.	25,000.00	1,400.00
	Income from stocks written off		588.00
	Total Other Stocks	$346,661.64	$11,978.00
Par Value	MORTGAGE NOTES		
$52,000	Edw. Babb & Co	$52,000.00	$1,181.25
8,200	S. C. Babbitt	8,200.00	315.00
3,500	Beta Nu House Corp	3,500.00	87.50
17,000	Beta Theta Pi	17,000.00	747.50
4,300	Bigelow	4,300.00	215.00
31,000	Delta Kappa Epsilon	31,000.00	387.51
15,250	Gamma Pi Corp	15,250.00	793.89
60,000	Martin	60,000.00	600.00
2,950	McKenzie	2,950.00	194.55
15,000	Palfrey, J. G.	15,000.00	.....
150,000	M. I. T. Dormitory	150,000.00	6,000.00
2,225	Orlogski	2,225.00	112.82
3,750	Phi Beta Epsilon Corp (partial)	3,750.00	243.33
9,250	Phi Delta Theta	9,250.00	448.97
13,250	Phi Gamma Delta	13,250.00	.....
9,000	Phi Kappa Sigma Trust	9,000.00	498.51
6,625	Phi Mu Delta	6,625.00	346.89
11,000	Theta Chi Trust	11,000.00	568.75
70,000	Walton Trust	70,000.00	3,500.00
	Total Mortgage Notes	$484,300.00	$16,241.47
	REAL ESTATE		
	Avon Street, Boston	$205,632.55	$625.95
	Broad and High Streets, Boston	100,000.00	5,107.84
	Franklin Street, Boston	385,364.53	*499.59*
	Memorial Drive, Cambridge	40,000.00	**1,414.50*
	Graduate House, Cambridge	644,037.07	**4,655.05*
	Bexley Hall, Cambridge	99,920.55	4,935.02
	Main Street, Worcester	224,887.28	9,011.71
	Taunton, Mass.	3,300.00	.....
	Willimantic, Conn.	103,199.08	.....
	Total Real Estate	$1,806,341.06	$13,111.38

* Expense.

Schedule H (*Continued*)

	Book Value	*Net Income*
RECAPITULATION, GENERAL INVESTMENTS		
U. S. Gov. Bonds	$4,870,000.00	$149,192.78
Canadian Gov. Bonds	909,546.37	35,050.13
Industrial Bonds	629,141.64	29,930.22
Industrial Preferred Stocks	787,192.26	45,696.00
Industrial Common Stocks	10,525,220.66	388,689.94
Public Utility Bonds	3,275,317.64	230.084.20
Public Utility Preferred Stocks	988,195.25	48,296.00
Public Utility Common Stocks	2,000,007.14	83,616.50
Railroad Bonds	2,944,947.42	124,982.23
Railroad Preferred Stocks	80,024.40	.....
Railroad Common Stocks	374,390.28	11,425.00
Other Bonds	995,875.51	42,331.40
Bank Stocks	1,776,792.35	56,544.00
Insurance Stocks	444,379.26	12,215.00
Other Stocks	346,661.64	11,978.00
Mortgage Notes	484,300.00	16,241.47
Real Estate	1,806,341.06	13,111.38
Total General Investments	$33,238,332.88	$1,299,384.25

INVESTMENTS — SPECIAL

Par Value or Shares					
	INVESTMENTS BABSON FUND				
950	American Public Welfare Trust			$10,000.00	$237.50
	INVESTMENTS, (Real Estate) ALBERT FARWELL BEMIS FUND				
	Miscellaneous building lots and land in Wellesley, Weston and Dedham, carried at			$72,950.00	.....
	INVESTMENTS, MALCOLM COTTON BROWN FUND				
$25,000	Met. West Side	4s	1938	$10,850.00	.....
2,000	U. S. Treasury	3¼s	1945	2,000.00	$65.00
	Total Brown Fund			$12,850.00	$65.00
	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	6,200.00	180.00
	Total Coffin Fund			$42,173.04	$2,330.00

Schedule H (*Continued*)

Par Value or Shares				*Book Value*	*Net Income*
	INVESTMENTS, DRAPER FUND				
$12,000	U. S. Treasury	3¼s	1945	$12,400.00	$390.00
5,000	U. S. Treasury	3⅜s	1947–43	5,200.00	168.75
22,000	Ontario	5s	1959	21,890.00	1,100.00
8,000	Cons. Edison, N. Y.	3¼s	1946	8,200.00	260.00
10,000	Detroit Edison, D.	4½s	1961	11,200.00	450.00
20,000	New York Tel.	4½s	1939	19,395.00	900.00
13,000	Ohio Power	3¼s	1968	13,700.00	77.46
10,000	Texas Power & Light	5s	1956	10,400.00	500.00
	Income from bonds called				315.00
	Total Draper Fund			$102,385.00	$4,161.21
	INVESTMENTS, RICHARD LEE RUSSELL FUND				
$3,000	Mortgage Note (participation)			$3,000.00	$37.92
	INVESTMENTS, SOLAR ENERGY FUND				
100	Godfrey L. Cabot, Inc.			$647,700.00	$16,000.00
	INVESTMENTS, SUSAN H. SWETT FUND				
	Merged with General Investments, Dec. 1938, Income from securities sold or transferred			.....	$254.42
	INVESTMENTS, FRANCES E. WESTON FUNDS				
$8,950	Mortgage Note, Bartlett			$8,950.00	$358.97
	INVESTMENTS, JONATHAN WHITNEY FUND				
$41,000	U. S. Treasury	3¼s	1945	$42,500.00	$1,332.50
50,000	U. S. Treasury	4s	1954–44	54,000.00	2,000.00
46,000	U. S. Treasury	3⅜s	1947–43	48,500.00	1,552.51
40,000	Canada	5s	1952	44,000.00	2,000.00
42,000	Anaconda Copper	4½s	1950	44,000.00	1,890.00
50,000	Appalachian Electric	4s	1963	49,375.00	2,000.00
25,000	Bangor Hydro. Elec.	3¾s	1966	26,000.00	937.50
25,000	Detroit Edison, D.	4½s	1961	28,500.00	1,125.00
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
19,000	Niagara Falls Pr.	3½s	1966	20,300.00	665.00
25,000	Pacific Gas & Elec.	3¾s	1961	25,600.00	937.50
25,000	So. Cal. Edison	3¾s	1960	24,760.00	937.50
25,000	Va. Elec. Power	3½s	1968	26,600.00	260.07
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	25,500.00	937.50
	Income from bonds called				772.50
	Total Whitney Fund			$599,722.48	$23,847.58

Schedule H (*Continued*)

Par Value or Shares				*Book Value*	*Net Income*
	INVESTMENTS, TECHNOLOGY LOAN FUND				
$55,000	U. S. Treasury	3⅜s	1947–43	$58,600.00	$1,856.25
50,000	U. S. Treasury	4s	1954–44	54,300.00	2,000.00
50,000	Am. International	5½s	1949	52,200.00	2,750.00
50,000	Am. Power & Light	6s	2016	50,300.00	3,000.00
180,000	Brook.-Man. Tr.	4½s	1966	186,075.00	8,100.00
100,000	Eastern Gas & Fuel	4s	1956	93,496.00	4,000.00
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
14,000	Pac. Gas & Elec.	3¾s	1961	15,000.00	455.00
195	Cons. Gas. El. Lgt. & Pr. Balt.			25,000.00	702.00
500	International Power Securities, Pfd.			17,250.00	1,250.00
1,000	North American			36,796.89	1,200.00
1,250	Stone & Webster			36,698.75	.....
50,000	Baltimore & Ohio	4½s	1960	50,000.00	1,458.50
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				2,907.08
	Total Technology Loan Fund			$924,520.15	$34,303.83
	INVESTMENTS, EDWIN A. WYETH FUND				
$10,000	U. S. Treasury	2¾s	1965	$10,000.00	$137.50
22,000	U. S. Treasury	3s	1948–46	22,400.00	660.00
25,000	U. S. Treasury	4s	1954–44	27,000.00	1,000.00
10,000	U. S. Treasury	3⅛s	1952	10,400.00	312.50
100	American Can			11,944.73	400.00
250	General Motors			8,500.00	625.00
250	Pullman			11,750.00	281.25
101	Standard Oil, N. J.			5,903.32	100.00
100	Union Carbide and Carbon			4,640.00	170.00
100	United Shoe Machinery			8,941.25	400.00
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	10,500.00	375.00
9,000	Columbia Gas & Elec.	5s	1952	8,310.78	450.00
10,000	Cons. Edison, N. Y.	3⅛s	1946	10,100.00	325.00
14,000	Miss. River Power	5s	1951	14,500.00	700.00
16,000	So. Cal., Edison	3¾s	1960	15,880.00	600.00
10,000	Texas Pr. & Lgt.	5s	1956	10,400.00	500.00
15,000	Balt. & Ohio	4s	1948	15,000.00	600.00
5,000	Can. Pac. Eq. Tr.	5s	1944	5,100.00	250.00
10,000	Kansas City Term.	4s	1960	10,300.00	400.00
10,000	Union Pacific	4s	1947	10,400.00	400.00
	Income from bonds matured				112.71
	Total Wyeth Fund			$253,395.08	$10,423.96
	Grand Total All Investments			$35,915,978.63	$1,391,404.64
				(Schedule D)	(Schedule B)

SCHEDULE H-1

AGENCY FUNDS

Par Value or Shares				*Book Value*	*Net Income*
	INVESTMENTS, HEWETT FUND				
$15,000	U. S. Treasury	3¼s	1941	$15,300.00	$487.50
23,000	U. S. Treasury	4s	1954–44	24,800.00	920.00
12,000	Adams Express	4¼s	1946	12,300.00	*49.59*
8,000	Scoville Mfg. Co.	5½s	1945	7,920.00	440.00
20,000	United Biscuit	5s	1950	20,181.82	1,100.00
15,000	Alabama Power	5s	1951	13,425.00	750.00
15,000	Cent. N. Y. Power	3¾s	1962	15,700.00	562.50
15,000	Georgia Power	5s	1967	15,300.00	6.26
17,000	N. Y. Power & Light	4½s	1967	15,999.35	765.00
25,000	Texas Power & Light	5s	1956	25,900.00	1,250.00
20,000	Atch. Top. & S. Fe	4½s	1948	21,700.00	900.00
15,000	Can. Nat. Ry.	5s	1969	14,887.50	750.00
4,000	Can. Pac. Ry.	5s	1944	4,000.00	200.00
	Income from bonds called				1,497.92
	Total Hewett Fund			$207,413.67	$9,579.59
				(Schedule D)	
	INVESTMENTS, M.I.T. PENSION ASSOCIATION				
$100,000	U. S. Treasury	3¼s	1945–43	$105,956.00	$3,250.00
100,000	U. S. Treasury	4s	1954–44	110,184.00	4,000.00
10,000	U. S. Treasury	3s	1948–46	10,422.80	300.00
40,000	Montreal, Canada	4¼s	1941	40,700.00	344.72
16,000	Scovill Mfg.	5½s	1945	15,840.00	880.00
35,000	Alabama Power	5s	1946	35,950.00	1,750.00
50,000	Appalachian Elec.	4s	1963	49,375.00	2,000.00
30,000	Bell. Tel. of Pa.	5s	1948	31,628.00	1,500.00
10,000	Cedars Rapids M.&P.	5s	1953	10,000.00	500.00
50,000	Central N.Y. Power	3¾s	1962	50,057.00	1,875.00
50,000	Detroit Edison	4s	1965	53,802.00	2,000.00
29,000	Miss. River Power	5s	1951	29,308.00	1,450.00
40,000	N.Y. Power & Lt.	4½s	1967	39,499.62	1,800.00
50,000	Atch. Top.& S. Fe	4½s	1948	54,346.00	2,250.00
25,000	Atlantic Coast Line	4s	1952	24,753.15	1,000.00
25,000	Balt. & Ohio	4s	1948	25,178.00	1,000.00
25,000	Can. Pacific Eq.	5s	1944	25,238.00	1,250.00
50,000	Chicago Union Sta.	3¾s	1963	52,709.00	1,875.00
50,000	Kansas City Term.	4s	1960	52,448.47	1,780.00

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

Schedule H-1 (*Continued*)

Par Value or Shares				*Book Value*	*Net Income*
$50,000	Penn. Co.	4s	1963	$50,698.00	$1,720.00
35,000	Southern Pacific	4s	1955	33,638.79	1,400.00
Shares					
300	American Can			29,254.76	400.00
200	Eastman Kodak			28,500.00	.....
600	General Motors			29,332.24	1,200.00
800	General Electric Co.			42,462.59	510.00
505	Standard Oil, N. J.			29,893.60	400.00
155	Int. Business Machine			26,292.86	307.50
800	National Biscuit			21,220.31	640.00
400	Sears Roebuck			29,391.89	750.00
300	Union Carbide & Carbon			27,360.28	340.00
400	United Fruit			31,355.21	1,050.00
300	United Shoe Mach.			24,986.88	800.00
200	Am. Tel. & Tel. Co.			34,459.26	1,350.00
500	First National Bank, Boston			27,500.00	1,000.00
	Income from bonds sold				3,439.17
	Total Pension Association			$1,283,741.71	$46,111.39
				(Schedule D)	

INVESTMENT, WITMER FUND

$30,000	Mortgage Notes, Washington, D.C.			$30,000.00	$750.00
	Total Witmer Fund			$30,000.00	$750.00
				(Schedule D)	

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	5,633,099.43
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	206,725.75
Magnetic Substation	75,933.60
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
Cyclotron Research Building	20,247.92
Educational Equipment	2,039,953.60
Steam and Electrical Distribution System	138,975.19
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[1]	1,308,923.79
Boathouse	54,244.13
Barbour Field House and Squash Courts	84,042.54
Sailing Pavilion	28,849.09
Briggs Field House and Track	110,178.75
Camp, East Machias, Maine	120,558.00
Camp, Dover, New Jersey	35,000.00
Miscellaneous	314,827.59
Total June 30, 1939 (Schedule D)	$15,996,465.10

[1] Not including Graduate House (see Investments page 176).

SCHEDULE K

PRINCIPAL GIFTS AND APPROPRIATIONS FOR EDUCATIONAL PLANT

George Eastman for Buildings	$5,434,017.30
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 and Buildings	269,080.60
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
Caroline L. W. 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	261,192.55
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
Wright Memorial Wind Tunnel Fund, for Wind Tunnel	93,295.00
Alumni Fund, for Equipment, Dormitories, Walker, Briggs Field House and Track	744,119.38
Other Funds, Donations, Appropriations	2,515,025.75
Total, June 30, 1939 (Schedule D)	$16,000,989.62

SCHEDULE M

[1]ENDOWMENT FUNDS FOR GENERAL PURPOSES

No.	Restricted Funds	Funds, June 30, 1938	Investment Income	Other Receipts	Expended or Transferred	Funds, June 30 1939
101	George Robert Armstrong ..	$5,000.00	$201.00	.....	$201.00	$5,000.00
103	George Blackburn Mem. ...	907,654.36	36,489.54	.....	36,489.54	907,654.36
105	Charles Choate.....	35,858.15	1,443.18	.....	1,443.18	35,858.15
107	Eben S. Draper.....	101,406.11	4,161.21	$2,077.50	5,109.21	102,535.61
109	Coleman du Pont.....	215,927.55	8,787.72	5,397.93	8,787.72	221,325.48
111	Eastman Contract.....	9,498,869.55	381,855.78	.....	381,855.78	9,498,869.55
113	George Eastman (Building).	511,085.75	27,302.74	.....	[2]*16,314.21*	554,701.70
115	Charles W. Eaton.....	243,337.03	9,780.66	.....	9,780.66	243,337.03
117	Educational Endowment....	7,573,834.60	304,466.76	.....	304,466.76	7,573,834.60
119	Martha Ann Edwards.....	30,000.00	1,206.00	.....	1,206.00	30,000.00
121	William Endicott.....	25,000.00	1,005.00	.....	1,005.00	25,000.00
123	Francis Appleton Foster....	1,000,000.00	40,200.00	.....	40,200.00	1,000,000.00
125	John W. Foster.....	299,650.64	12,047.94	.....	12,047.94	299,650.64
127	Alexis H. French.....	5,000.00	201.00	.....	201.00	5,000.00
129	Jonathan French.....	25,212.48	1,013.04	.....	1,013.04	25,212.48
131	Henry C. Frick.....	1,831,053.42	73,610.22	.....	73,610.22	1,831,053.42
133	General Endowment.....	1,527,449.00	61,401.48	.....	61,401.48	1,527,449.00
135	Eliot Granger.....	21,568.43	868.32	.....	868.32	21,568.43
136	Charles Hayden.....	1,000,000.00	40,200.00	.....	40,200.00	1,000,000.00
137	James Fund.....	163,654.21	6,580.74	.....	6,580.74	163,654.21
139	Katherine B. Lowell.....	5,000.00	201.00	.....	201.00	5,000.00
141	Thomas McCammon	15,000.00	603.00	.....	603.00	15,000.00
143	M. I. T. Alumni.....	214,828.83	10,050.00	[5]114,840.60	122,000.00	217,719.43
145	Kate M. Morse.....	25,000.00	1,005.00	.....	1,005.00	25,000.00
147	Everett Morss.....	25,000.00	1,005.00	.....	1,005.00	25,000.00
149	Richard Perkins.....	50,000.00	2,010.00	.....	2,010.00	50,000.00
150	J. W. and B. L. Randall ...	83,452.36	3,356.70	.....	3,356.70	83,452.36
151	Wm. Barton Rogers Mem...	250,225.00	10,058.04	.....	10,058.04	250,225.00
152	[3]Saltonstall Fund.....	62,104.86	2,496.42	.....	1,872.30	62,728.98
153	Samuel E. Sawyer.....	4,764.40	192.96	.....	192.96	4,764.40
155	Andrew Hastings Spring ...	50.000.00	2,010.00	.....	2,010.00	50,000.00
157	Seth K. Sweetser.....	25,061.62	1,009.02	.....	1,009.02	25,061.62
159	William J. Walker.....	23.613.59	948.72	.....	948.72	23,613.59
161	Horace Herbert Watson....	34,076.69	1,370.82	.....	1,370.82	34,076.69
163	Albion K. P. Welch.....	5,000.00	201.00	.....	201.00	5,000.00
165	Everett Westcott.....	171,394.00	6,890.28	.....	6,890.28	171,394.00
167	Marion Westcott.....	238,202.00	9,575.64	.....	9,575.64	238,202.00
169	[4]George Wigglesworth.....	25,776.02	1,037.16	.....	933.45	25,879.73
171	Edwin A. Wyeth.....	254,412.79	10,423.96	146.20	12,355.46	252,627.49
		$26,584,472.44	$1,077,267.05	$122,462.23	$1,147,751.77	$26,636,449.95
	Unrestricted Funds					
172	Edmund D. Barbour.....	$27,822.53	$1,117.56	.....	$1,117.56	$27,822.53
173	Stephen L. Bartlett.....	.....	2,010.00	$306,747.40	27,018.12	281,739.28
176	N. Loring Danforth.....	5,000.00	201.00	.....	201.00	5,000.00
177	Pierre du Pont.....	20,000.00	.....	.....	20,000.00	.....
178	F. W. Emery.....	250.00	.....	.....	250.00	.....

[1] See alphabetical listing and description of Funds on pages 199–213.
[2] Credit-Adjustment due to Refund Account of New Architectural Building.
[3] One-fourth of net income added to Fund.
[4] Ten per cent of gross income added to Fund.
[5] Including $25,521.20, gain on sale of U. S. Rubber Pfd. stock.

Schedule M (*Continued*)

No.	*Unrestricted Funds (Continued)*	*Funds, June 30, 1938*	*Investment Income*	*Other Receipts*	*Expended or Transferred*	*Funds, June 30, 1939*
180	Henrietta G. Fitz	$10,000.00	$402.00	.....	$402.00	$10,000.00
181	George Wyman Hamilton	133.85	.....	.....	133.85	.....
183	James W. Henry	8,226.08	.....	$172.71	8,398.79	.....
185	Abby W. Hunt	4,000.00	.....	.....	4,000.00	.....
187	Industrial Fund	38,266.71	804.00	.....	26,737.99	12,332.72
189	Hiram H. Logan	12,255.20	281.40	.....	5,903.61	6,632.99
195	Emerette O. Patch	7,500.00	269.34	740.84	3,269.34	5,240.84
199	Charles O. Prescott	4,840.78	.....	.....	4,840.78	.....
201	Robert E. Rogers	7,680.77	309.54	.....	309.54	7,680.77
205	Frank G. Webster	25,000.00	1,005.00	.....	1,005.00	25,000.00
		$170,975.92	$6,399.84	$307,660.95	$103,587.58	$381,449.13

SCHEDULE M
[1]ENDOWMENT FUNDS FOR DESIGNATED PURPOSES

	Special Deposit and Agency Funds					
210	Endowment Reserve	$899,260.93	.....	$301,908.35	$486,787.91	$714,381.37
211	Income Equalization Reserve	60,867.50	$2,448.18	.....	25,000.00	38,315.68
212	Albert Fund	5,122.91	201.00	1,000.00	1,885.85	4,438.06
214	Alpha Chi Sigma House Fund	2,944.70	124.62	110.00	.....	3,179.32
216	Anonymous (1924)	2,099.71	84.42	.....	.....	2,184.13
220	Basket Ball Fund	2,499.88	116.58	700.00	.....	3,316.46
222	Bess Bigelow Fund	26,109.90	1,049.22	.....	.....	27,159.12
223	[2]Ednah Dow Cheney	15,145.53	611.04	.....	183.67	15,572.90
225	Class of 1923	19,469.01	783.90	913.04	279.60	20,886.35
226	Class of 1924	20,453.45	820.08	335.87	168.80	21,440.60
227	Class of 1925	12,399.47	498.48	778.68	142.38	13,534.25
229	Class of 1926	15,391.73	623.10	423.67	18.16	16,420.34
230	Class of 1927	13,078.22	530.64	744.45	.....	14,353.31
231	Class of 1928	31,904.05	1,294.44	460.13	.....	33,658.62
232	Class of 1929	9,569.57	393.96	624.24	.....	10,587.77
233	Class of 1930	1,388.72	56.28	.....	.....	1,445.00
237	Class of 1934	391.61	16.08	28.93	.....	436.62
238	Class of 1935	342.84	12.06	.16	.....	355.06
239	Class of 1936	478.00	20.10	.....	.....	498.10
240	Class of 1939	.....	.....	559.50	.....	559.50
245	Cosmic Terr. Research	19,609.50	385.92	.....	10,000.00	9,995.42
248	Drama Club Theatre Fund	400.00	16.08	.....	.....	416.08
250	Industrial Relations	32,510.00	1,125.60	35,150.00	23,000.00	45,785.60
255	M. I. T. Employees Fund	.....	20.10	1,187.83	522.86	685.07
260	M. I. T. Teachers' Insurance	5,500.00	.....	30,551.74	29,230.40	6,821.34
261	M.I.T. Teachers' Insurance (Special)	89,243.23	3,859.20	17,298.44	6,612.88	103,787.99
263	M.I.T. Alumni Association Permanent Funds	75,342.77	3,175.80	6,209.25	.....	84,727.82
264	Henry A. Morss Nautical	2,940.86	116.58	.....	.....	3,057.44
265	Louisville Technology Foundation Fund	50.00	.....	.....	.....	50.00

[1] See alphabetical listing and description of Funds on pages 199–213.
[2] Previously carried under Funds for Library.

[1]Schedule M (*Continued*)

No.	*Special Deposit and Agency Funds (Continued)*	*Funds, June 30, 1938*	*Investment Income*	*Other Receipts*	*Expended or Transferred*	*Funds, June 30, 1939*
266	Class of 1917, Special	$104.55	$4.02	.....	.....	$108,57
268	Class of 1934, Special	561.94	24.12	.....	.....	586.06
270	Class of 1898 Loan	†8,637.39	345.72	$162.66	.....	†9,145.77
273	Class of 1874	209.53	8.04	.....	.....	217.57
275	Richards Portrait	704,35	28.14	.....	.....	732.49
277	W. P. Ryan, Special	3,769.32	152.76	.....	.....	3,922.08
	Theo. Edward Schwarz Mem.	**1,167.49*	.....	1,221.86	$54.37	.....
279	Sedgwick Memorial Lecture	10,420.55	430.14	308.32	.....	11,159.01
283	Walter B. Snow	.....	281.40	7,500.00	.....	7,781.40
281	Lillie C. Smith	5,106.67	201.00	.....	46.05	5,261.62
285	Technology Matrons' Teas	9,154.02	369.84	.....	400.40	9,123.46
286	W. B. S. Thomas' Fund	2,256.25	92.46	.....	.....	2,348.71
290	Undergraduate Activities Trust	1,269.01	52.26	.....	.....	1,321.27
292	Undergraduate Publication Trust	17,825.46	715.56	.....	1,400.00	17,141.02
294	Undergraduate Dues, Res. Athletics	14,833.34	594.96	.....	.....	15,428.30
296	Undergraduate Dues, Res. Contingent	16,017.07	643.20	.....	.....	16,660.27
		$1,454,216.05	$22,327.08	$408,177.12	$585,733.33	$1,298,986.92

FUNDS FOR SALARIES

301	Samuel C. Cobb For General Salaries	$36.551.31	$1,471.32	.....	$1,471.32	$36,551.31
303	Sarah H. Forbes For General Salaries	500.00	20.10	.....	20.10	500.00
305	George A. Gardner For General Salaries	20.000.00	804.00	.....	804.00	20,000.00
309	James Hayward Professorship of Engineering	18,800.00	755.76	.....	755.76	18,800.00
311	William P. Mason Professorship of Geology	18,800.00	755.76	.....	755.76	18,800.00
313	Henry B. Rogers For General Salaries	25,000.00	1,005.00	.....	1,005.00	25,000.00
315	Nathaniel Thayer Professorship of Physics	25,000.00	1,005.00	.....	1,005.00	25,000.00
317	Elihu Thomson Professorship, Elec. Eng.	23,680.87	952.74	.....	952.74	23,680.87
		$168,332.18	$6,769.68	.....	$6,769.68	$168,332.18

[1]See alphabetical listing and description of Funds on pages 199–213.
* Overdraft.
†Exclusive of student notes receivable. (See Schedule P.)

[1] Schedule M (*Continued*)

No.	Funds for Library	*Funds, June 30, 1938*	*Investment Income*	*Other Receipts*	*Expended or Transferred*	*Funds, June 30, 1939*
321	Walter S. Barker	$11,032.67	$442.20	.....	$1,067.46	$10,407.41
325	Frank Harvey Cilley	86,119.45	3,461.22	.....	3,966.50	85,614.17
327	Charles Lewis Flint	5,639.07	225.12	.....	143.37	5,720.82
341	William Hall Kerr	3,846.74	152.76	.....	71.73	3,927.77
343	George A. Osborne	10,385.05	418.08	.....	340.19	10,462.94
345	Arthur Rotch, Architectural.	6,985.16	277.38	.....	610.10	6,652.44
349	John Hume Tod	3,123.14	124.62	.....	101.41	3,146.35
351	Theodore N. Vail	40,484.32	1,608.00	.....	2,400.00	39,692.32
		$167,615.60	$6,709.38	.....	$8,700.76	$165,624.22
	Funds for Departments					
401	William Parsons Atkinson	$13,082.20	$526.62	.....	$526.62	$13,082.20
403	Frank Walter Boles Memorial	32,471.44	1,306.50	.....	522.79	33,255.15
405	William E. Chamberlain	7,309.77	293.46	.....	293.46	7,309.77
407	Chemical Engineering Practice	257,772.97	10,363.56	.....	10,363.56	257,772.97
409	Crosby Honorary Fund	1,656.16	68.34	.....	.....	1,724.50
411	Susan E. Dorr	95,955.67	3,859.20	.....	3,859.20	95,955.67
412	George Eastman	400,000.00	16,080.00	.....	16,080.00	400,000.00
414	Arthur Dehon Little Memorial	46,600.00	1,873.32	.....	1,873.32	46,600.00
417	George Henry May	5,000.00	201.00	.....	201.00	5,000.00
418	Metallurgy, Special	1,020.00	.....	.....	1,020.00	.....
419	Susan Minns	40,000.00	.....	.....	.....	40,000.00
420	Forris Jewett Moore	20,757.50	836.16	.....	[2]*458.54*	22,052.20
422	William E. Nickerson	9,113.84	261.30	.....	5,354.11	4,021.03
424	Edward D. Peters	6,150.71	249.24	.....	.....	6,399.95
425	Pratt Naval Architectural	392,399.95	15,774.48	.....	15,684.85	392,489.58
426	Frances E. Roper	2,000.00	80.40	.....	80.40	2,000.00
427	Arthur Rotch	25,000.00	1,005.00	.....	1,005.00	25,000.00
429	W. T. Sedgwick	83,642.11	3,240.12	.....	7,000.00	79,882.23
431	[3]Edmund K. Turner	259,778.40	10,443.96	.....	8,351.18	261,871.18
433	William Lyman Underwood	17,036.48	623.10	.....	1,500.00	16,159.58
		$1,716,747.20	$67,085.76	.....	$73,256.95	$1,710,576.01
	Funds for Research					
442	Albert Farwell Bemis	.....	$8,442.00	$385,483.42	$17,199.73	$376,725.69
443	Samuel Cabot	$51,787.31	2,082.36	.....	2,500.00	51,369.67
444	Crane Automotive Research.	3,868.17	156.78	.....	.....	4,024.95
449	Ellen H. Richards	22,642.25	908.52	.....	630.16	22,920.61
451	Charlotte B. Richardson	46,197.08	1,857.24	.....	2,000.00	46,054.32
452	William Barton and Emma Savage Rogers	105,443.84	4,824.00	24,699.18	.....	134,967.02
453	Solar Energy	648,200.00	16,000.00	.....	16,683.30	647,516.70
454	Henry N. Sweet	8,748.70	349.74	.....	.....	9,098.44
456	Textile Research Fund	2,926.58	120.60	5,000.00	4,750.00	3,297.18
458	Edward Whitney	8,464.39	335.61	.....	8,800.00	.....
459	Wright Memorial Wind Tunnel	62,248.34	.....	10,000.00	72,248.34	.....
		$960,526.66	$35,076,85	$425,182.60	$124,811.53	$1,295,974.58

[1] See alphabetical listing and description of Funds on pages 199–213.
[2] Credit-Adjustments 1937-38 Accounts.
[3] One-fourth net income added to Fund.

[1] Schedule M (*Continued*)

No.		Funds, June 30, 1938	Investment Income	Other Receipts	Expended or Transferred	Funds, June 30, 1939
	FUNDS FOR FELLOWSHIPS					
462	American Institute of Baking	.....	.....	$750.00	.....	$750.00
463	William Sumner Bolles	$28,043.15	$1,125.60	.....	$1,200.00	27,968.75
464	Malcolm Cotton Brown	12,398.02	65.00	.....	84.00	12,379.02
466	Collamore	14,725.16	590.94	.....	650.00	14,666.10
468	Dalton Graduate Chemical	7,546.19	301.50	.....	350.00	7,497.69
469	du Pont de Nemours	.....	.....	750.00	750.00	.....
474	Rebecca R. Joslin	†8,872.28	357.78	.....	.....	9,230.06
476	Wilfred Lewis	5,665.91	229.14	.....	.....	5,895.05
478	Moore	32,625.62	1,310.72	.....	500.00	33,436.34
480	Willard B. Perkins	7,574.86	305.32	.....	1,500.00	6,380.18
484	Proprietors Locks and Canals	4,308.16	160.80	.....	800.00	3,668.96
486	Henry Bromfield Rogers	25,630.52	1,029.12	.....	1,100.00	25,559.64
488	Richard Lee Russel	3,313.43	37.92	.....	.....	3,351.35
490	Henry Saltonstall	11,023.94	442.20	.....	500.00	10,966.14
492	James Savage	13,129.13	526.62	.....	600.00	13,055.75
493	Sloan	.....	.....	1,000.00	1,000.00	.....
495	Susan H. Swett	11,944.18	494.42	.....	3,000.00	9,438.60
496	Gerard Swope	138.75	.....	.....	.....	138.75
497	Frank Hall Thorp	10,765.14	434.16	.....	500.00	10,699.30
498	Luis Francisco Verges	10,311.85	414.06	.....	.....	10,725.91
		$208,016.29	$7,825.30	$2,500.00	$12,534.00	$205,807.59
	FUNDS FOR SCHOLARSHIPS					
501	Elisha Atkins	$5,238.25	$209.04	.....	$250.00	$5,197.29
503	Billings Student	52,298.12	2,102.46	.....	2,700.00	51,700.58
504	Jonathan Bourne	10,988.82	442.20	.....	500.00	10,931.02
505	Albert G. Boyden	588,348.45	23,517.00	$4,100.00	30,512.81	585,452.64
506	Harriet L. Brown	7,695.23	309.54	.....	350.00	7,654.77
508	Nino Tesher Catlin	1,054.59	44.22	.....	50.00	1,048.81
511	Lucius Clapp	5,269.80	213.06	.....	250.00	5,232.86
513	Class of 1896	†6,442.35	261.30	100.00	250.00	†6,553.65
514	Class of 1909	1,717.98	68.34	18.69	80.17	1,724.84
515	Class of 1938	422.50	20.10	104.68	.....	547.28
516	Lucretia Crocker	80,034.71	3,216.00	.....	3,846.00	79,404.71
517	Isaac W. Danforth	5,548.80	221.10	.....	250.00	5,519.90
520	Ann White Dickinson	42,848.38	1,720.56	.....	2,497.00	42,071.94
521	Thomas M. Drown	53,474.86	2,150.70	.....	3,900.00	51,725.56
524	Farnsworth	5,706.96	229.14	.....	250.00	5,686.10
526	Charles Lewis Flint	5,715.76	229.14	.....	240.00	5,704.90
527	Sarah S. Forbes	3,843.61	152.76	.....	170.00	3,826.37
531	George Hollingsworth	5,370.56	217.08	.....	200.00	5,387.64
533	T. Sterry Hunt	3,342.29	132.66	.....	170.00	3,304.95

[1] See alphabetical listing and description of Funds on pages 199–213.
†Exclusive of student notes receivable. (See Schedule P.)

Schedule M (*Continued*)

No.		*Funds, June 30, 1938*	*Investment Income*	*Other Receipts*	*Expended or Transferred*	*Funds, June 30, 1939*
534	William F. Huntington	$5,477.81	$221.10	.....	$240.00	$5,458.91
536	Joy Scholarships	17,863.72	719.58	.....	800.00	17,783.30
538	William Litchfield	5,585.45	225.12	.....	250.00	5,560.57
539	Elisha T. Loring	5,586.14	225.12	.....	250.00	5,561.26
541	Lowell Institute Scholarship	2,796.99	112.56	.....	120.00	2,789.55
542	Rupert A. Marden	2,091.12	84.42	.....	90.00	2,085.54
543	George Henry May	†8,093.15	325.62	.....	600.00	†7,818.77
545	James H. Mirrlees	2,810.14	112.56	.....	100.00	2,822.70
547	Nichols Scholarship	5,549.64	221.10	.....	240.00	5,530.74
548	Charles C. Nichols	5,547.09	221.10	.....	250.00	5,518.19
550	John Felt Osgood	5,406.84	217.08	.....	250.00	5,373.92
551	George L. Parmelee	19,274.06	775.86	.....	1,350.00	18,699.92
552	Richard Perkins	54,738.34	2,198.94	.....	4,200.00	52,737.28
553	Thomas Adelbert Read	22,280.38	896.46	.....	1,500.00	21,676.84
554	John Roach	3,176.50	128.64	.....	125.00	3,180.14
555	William P. Ryan Memorial	4,378.13	176.88	.....	.....	4,555.01
556	John P. Schenkl	47,733.10	1,917.54	.....	2,706.00	46,944.64
557	Thomas Sherwin	5,519.75	221.10	.....	240.00	5,500.85
558	Horace T. Smith	34,459.05	1,386.90	.....	2,010.00	33,835.95
559	Sons and Daughters New England Colony	640.82	24.12	.....	25.00	639.94
560	Samuel E. Tinkham	2,516.39	100.50	.....	100.00	2,516.89
562	F. B. Tough	638.59	24.12	.....	.....	662.71
563	Susan Upham	1,207.69	48.24	.....	50.00	1,205.93
565	Vermont Scholarship	25,670.36	1,033.14	.....	1,450.00	25,253.50
567	Ann White Vose	63,261.79	2,544.66	.....	4,929.00	60,877.45
569	Arthur M. Waitt	10,607.11	426.12	.....	480.00	10,553.23
571	Louis Weissbein	4,422.60	176.88	.....	200.00	4,399.48
573	Frances Erving Weston	7,187.36	288.51	.....	.....	7,475.87
574	Samuel Martin Weston	5,697.45	227.24	.....	.....	5,924.69
576	Amasa J. Whiting	4,907.52	196.98	.....	200.00	4,904.50
577	Elizabeth Babcock Willmann	5,437.71	217.08	.....	200.00	5,454.79
		$1,275,924.81	$51,151.67	$4,323.37	$69,420.98	$1,261,978.87
	FUNDS FOR PRIZES					
580	Babson	$10,118.75	$237.50	.....	.....	$10,356.25
581	Robert A. Boit	5,204.15	209.04	.....	.....	5,413.19
583	Class of 1904	627.47	24.12	.....	$15.00	636.59
584	William Emerson	.....	.....	$2,059.00	.....	2,059.00
585	Roger Defriez Hunneman	1,013.09	40.20	.....	40.00	1,013.29
587	James Means	3,379.49	136.68	.....	187.00	3,329.17
589	Arthur Rotch	7,318.24	293.46	.....	200.00	7,411.70
591	Arthur Rotch, Special	10,847.82	434.16	.....	200.00	11,081.98
593	Samuel W. Stratton	1,745.83	68.34	.....	111.50	1,702.67
		$40,254.84	$1,443.50	$2,059.00	$753.50	$43,003.84

[1] See alphabetical listing and description of Funds on pages 199–213.
† Exclusive of student notes receivable. (See Schedule P.)

[2] Schedule M (*Continued*)

No.		*Funds, June 30, 1938*	*Investment Income*	*Other Receipts*	*Expended or Transferred*	*Funds, June 30, 1939*
	FUNDS FOR RELIEF					
601	Edward Austin	$443.042.98	$17,607.60	.....	$22,500.00	$438,150.58
603	Thomas Wendell Bailey	2,747.37	108.54	.....	110.00	2,745.91
604	[1]Charles Tidd Baker	32,280.04	1,298.46	.....	700.00	32,878.50
606	Levi Boles	11,153.27	450.24	.....	500.00	11,103.51
608	Bursar's Fund	†18,549.97	747.72	$1,508.71	1,175.00	† 19,631.40
610	Mabel Blake Case	27,445.40	1,101.48	.....	1,200.00	27,346.88
611	Chandler	4,950.81	201.00	.....	.....	5,151.81
612	Fred L. and Florence L. Coburn	5,277.97	213.06	.....	225.00	5,266.03
614	Coffin Memorial	42,392.00	2,330.00	.....	2,401.00	42,321.00
616	Dean's Fund	†4,791.65	209.04	2,172.69	1,460.00	†5,713.38
618	Carl P. Dennett	†832.91	32.16	1.00	.....	†866.07
620	Dormitory Fund	4,089.69	164.82	.....	175.00	4,079.51
621	Frances and William Emerson	†101,743.27	4,100.40	200.00	4,400.00	†101,643.67
623	Norman H. George	95,803.06	3,851.16	.....	4,400.00	95,254.22
625	John A. Grimmons	†1,868.34	.....	1,795.52	3,300.00	†363.86
627	James H. Haste	183,423.65	7,372.68	.....	8,200.00	182,596.33
629	David L. Jewell	26,608.67	1,069.32	.....	1,200.00	26,477.99
630	Llora Culver Krueger	5,165.67	209.04	.....	.....	5,374.71
631	William B. Rogers	†41,396.74	1,668.30	704.14	1,800.00	†41,969.18
632	Summer Surveying Camp	†1,485.95	60.30	297.24	.....	†1,843.49
634	Teachers' Fund	113,361.35	4,558.68	.....	4,433.00	113,487.03
635	Technology Loan Fund	†971,557.05	34,303.83	116,879.17	193,061.76	†929,678.29
636	Alice Brown Tyler	1,065.50	44.22	.....	.....	1,109.72
637	Thomas Upham	.....	804.00	302,794.00	.....	303,598.00
638	Samson R. Urbino	1,095.87	44.22	.....	50.00	1,090.09
639	Jonathan Whitney	605,208.44	23,847.58	1,426.11	41,501.65	588,980.48
640	Morrill Wyman	73,419.87	2,950.68	.....	3,300.00	73,070.55
		$2,820,757.49	$109,348.53	$427,778.58	$296,092.41	$3,061,792.19

RECAPITULATION OF FUNDS

FOR GENERAL PURPOSES					
Restricted	$26,584,472.44	$1,077,267.05	$122,462.23	$1,147,751.77	$26,636,449.95
Unrestricted	170,975.92	6,399.84	307,660.95	103,587.58	381,449.13
FOR DESIGNATED PURPOSES					
Special Deposit Funds	$1,454,216.05	$22,327.08	$408,177.12	$585,733.33	$1,298,986.92
Salaries	168,332.18	6,769.68	.....	6,769.68	168,332.18
Libraries, etc.	167,615.60	6,709.38	.....	8,700.76	165,624.22
Departments	1,716,747.20	67,085.76	.....	73,256.95	1,710,576.01
Research	960,526.66	35,076.85	425,182.60	124,811.53	1,295,974.58
Fellowships	208,016.29	7,825.30	2,500.00	12,534.00	205,807.59
Scholarships	1,275,924.81	51,151.67	4,323.37	69,420.98	1,261,978.87
Prizes	40,254.84	1,443.50	2,059.00	753.50	43,003.84
Relief	2,820,757.49	109,348.53	427,778.58	296,092.41	3,061,792.19
Total	$35,567,839.48	$1,391,404.64	$1,700,143.85	$2,429,412.49	$36,229,975.48
		(Schedule B)	(Schedule B)	.....	(Schedule D)

[1]One-half of the income added to the principal.
[2]See alphabetical listing and description of Funds on pages 199–213.
† Exclusive of student notes receivable. (See Schedule P.)

SCHEDULE P

STUDENT NOTES RECEIVABLE

Fund	*Notes Receivable June 30, 1938*	*Loans Made 1938–39*	*Loans Repaid 1938–39*	*Notes Receivable June 30, 1939*	*Interest Received 1938–39*
Technology Loan Fund ...	$758,649.41	$167,173.00	$101,635.33	$824,187.08	$15,228.84
Bursar's Fund.....	7,108.55	1,175.00	1,404.00	6,879.55	94.71
Rogers Fund.....	5,043.86	.....	546.14	4,497.72	158.00
Dean's Fund.....	2,984.06	860.00	1,091.69	2,752.37	48.28
C. E. Summer Camp	615.00	.....	285.00	330.00	12.24
Grimmons Sch. Loan Fund.	1,420.00	.....	.....	1,420.00	10.42
Dennett Fund.....	665.00	.....	.....	665.00	1.00
G. H. May Sch. Fund	4,075.00	600.00	.....	4,675.00	.....
Hygiene Special Fund.....	3,877.83	238.74	65.00	4,051.57	1.64
Class of 1898 Fund.....	250.00	.....	150.00	100.00	12.66
Class of 1896 Fund.....	1,000.00	250.00	.....	1,250.00	.....
Emerson Fund.....	550.00	.....	.....	550.00	.....
Chemical Engineering Fund	380.69	.....	.....	380.69	.....
C. W. Eaton Fund.....	600.00	.....	.....	600.00	.....
Total.....	$787,219.40	$170,296.74	$105,177.16	$852,338.98	$15,567.79

(Schedule D)

SCHEDULE R
CURRENT FUNDS

Name	Balance June 30, 1938	Income	Other Increases or Transfers	Expenditures from Income or Balances	Other Expenditures or Transfers	Balance June 30, 1939
Additional Group Ins. Fund	$ .85	$8,227.49	.....	$8,208.69	.....	$19.65
Aeronautical Engineering						
Flying Instruction	.....	.....	[1]493.53	.....	$493.53	.....
Bureau of Agri. Res.....	*360.93	5,112.79	[2]3,294.07	5,445.93	2,600.00	.....
Aerodynamic Res.....	.....	9,000.00	.....	.....	.....	9,000.00
Spec. 500–762 Acct.	.....	.....	[2]598.62	598.62	.....	.....
Spec. No. 1447.....	.....	.....	[1]450.00	.....	450.00	.....
Summer Shop Course...	706.19	.....	[1]400.00	.....	374.81	731.38
Wind Tunnels.....	7,770.33	3,254.00	[2]32.03	11,056.36	.....	.....
Alcohol Res. No. 1175 ..	470.82	.....	.....	443.58	.....	27.24
No. 1282a Wind Tunnel Equip.— Carnegie ...	*1,028.21	15,000.00	.....	10,880.17	32.03	3,059.59
Hurricane Res.....	4.99	.....	[1][2]1,514.43	4.99	1,514.43	.....
Detonation Research...	1,155.89	2,000.00	[2]2,000.00	3,095.33	2,000.00	60.56
Alumni Day 1939.....	.....	4,804.23	[1]1,000.00	5,804.23	.....	.....
Alumni Fund Expenses — New Gym.....	4,000.00	178.41	.....	178.41	.....	4,000.00
Architecture:						
Spec. No. 1533A Cases .	.....	.....	[2]2,995.00	.....	.....	2,995.00
Spec. No. 1533 Stud.Shop	.....	.....	[2]1,586.00	.....	69.21	1,516.79
Spec. No. 1455 Reception	.....	.....	[1]2,395.28	.....	2,395.28	.....
Travel, Scholarship.....	.....	.....	[2]1,500.00	.....	1,500.00	.....
Special No. 1095.....	[3]*4,266.58	10,623.24	.....	1,434.05	4,922.61	.....
Special No. 1095A	[4]*1,188.42	.....	[2]4,922.61	202.00	.....	3,532.19
Needy Student Scholarship	.....	.....	[2]600.00	.....	600.00	.....
Bemis Found. Res.....	.....	.....	[2]9,170.40	.....	9,170.40	.....
Biology — Food Research.	6,848.24	.....	[1]2,200.00	732.53	3,650.00	4,665.71
Biol. Eng. Spec.	.....	.....	[1]2,000.00	.....	1,921.54	78.46
Hospital Research.....	.....	230.20	.....	230.20	.....	.....
Health Education.....	1,166.58	1.50	.....	213.11	405.00	549.97
Special Research	1,235.66	300.00	[2]2,000.00	1,048.38	2,000.00	487.28
Rock. Vitamin Res.	17.00	.....	[1][2]3,000.00	.....	2,368.92	648.08
Account 4133.....	45.91	.....	[2]150.00	35.40	150.00	10.51
Nat. Res. Council Grant N.A.S.....	.....	600.00	.....	30.97	.....	569.03
Emergency Comm.— Displaced Foreign Physicians	300.00	.....	[2]1,350.00	.....	1,650.00	.....
Blue Cross Hospitalization.	2.55	7,405.65	.....	7,400.10	.....	8.10
Boat House Equipment ...	263.91	205.25	.....	259.68	.....	209.48
Building Key Account....	2,358.04	1,248.00	.....	1,261.93	.....	2,344.11
Bus. and Eng. Administration:						
Case Research Account .	8.96	150.00	.....	66.16	.....	92.80
Graduate Fellow. Fund .	180.22	.....	.....	.....	.....	180.22
Sloan Fel. Fund 1938 ...	181.81	15,000.00	.....	14,869.35	.....	312.46
Sloan Fel. Fund 1939 ...	.....	.....	[2]5,759.46	5,759.46	.....	.....
Spec. No. 1445 Library .	.....	.....	[1]1,228.18	.....	1,228.18	.....
J. R. Macomber Fund..	5.84	.....	.....	.....	.....	5.84
Carnegie Pension Account.	.....	50,167.77	[2]4,350.29	54,518.06	.....	.....

[1] Appropriation from Current Income.
[2] By Transfer.
[3] Account of Wellesley Property.
[4] Account of Wakefield Property.
* Overdraft

Schedule R (*Continued*)

Name	*Balance June 30, 1938*	*Income*	*Other Increases or Transfers*	*Expenditures from Income or Balances*	*Other Expenditures or Transfers*	*Balance June 30, 1939*
Chemistry:						
Moore Lecture Fund ...	$87.50	.....	.....	.....	.....	$87.50
Special No. 1260.....	174.02	.....	.....	.....	.....	174.02
Kellogg Graduate Fellow.	1,100.00	.....	.....	$1,100.00	.....	.....
Rockefeller Research....	1,985.76	.....	.....	804.40	$200.00	981.36
Special No. 1324.....	2,735.01	.....	.....	2,233.57	.....	501.44
Chemical Cellulose Res..	.....	[3]$4,310.12	[2]$11,000.00	4,310.12	11,000.00	.....
Warren Fund — Schumb	98.77	.....	.....	.....	.....	98.77
A. A. A. & S.— Davis ...	184.00	.....	.....	80.25	.....	103.75
Milas Lignin Research..	496.16	1.41	.....	497.57	.....	.....
Res.Lab.Phys.Chem.Royal	594.93	.....	.....	122.60	.....	472.33
Chem. Eng.: Spec. Equip..	1,000.00	.....	.....	.....	.....	1,000.00
Spec. No. 1498 Hauser .	.....	.....	[2]1,000.00	669.76	.....	330.24
Spec. No. 1449.....	.....	.....	[1][2]7,500.00	.....	5,964.54	1,535.46
Fuels Res.....	2,929.26	.....	.....	.....	.....	2,929.26
Hauser Inorganic Film Res.	.....	480.00	.....	400.00	.....	80.00
No. 1207.....	755.02	.....	.....	275.03	.....	479.99
Special No. 1421.....	250.00	.....	.....	.....	.....	250.00
Civil Engineering:						
Special No. 1364.....	6,198.33	.....	.....	1,973.57	.....	4,224.76
Soil Mechanics.....	783.18	.....	[1]1,000.00	.....	952.38	830.80
Spec.No.1056,Chem.Res.	60.48	.....	[1]1,250.00	.....	563.09	747.39
Special No. 1326.....	408.67	.....	[1]300.00	.....	42.72	665.95
River Hydraulic Lab....	845.24	10.00	.....	852.51	.....	2.73
Structural Lab.....	655.22	.....	[1]1,200.00	133.57	1,200.00	521.65
U.S. Cape Cod. Can. Res.	93.35	.....	.....	.....	.....	93.35
Cosmic Terr. Res.....	88.52	.....	[2]10,000.00	.....	7,794.01	2,294.51
Crafts Library Fund	479.53	.....	.....	.....	.....	479.53
Dean's Special Fund	†432.72	.....	.....	432.72	.....	.....
Dining Service Reserve....	4,747.01	3,054.95	.....	3,737.92	.....	4,064.04
Div.of Indus.Cooperation.	.....	61,033.86	[2]17,552.99	61,033.86	17,552.99	.....
D.I.C.Stainless Steel Res..	.....	.....	[2]2,000.00	.....	2,000.00	.....
Economics: Ind. Relations	676.61	.....	[2]25,838.16	.....	17,914.40	8,600.37
Electrical Engineering:						
A. E. I. C. Res.....	2,966.61	[3]3,896.57	[2]7,903.43	4,211.65	7,903.43	2,651.53
VI-A Fund.....	281.54	.....	[1]1,000.00	.....	597.98	683.56
Humane Society of Mass. — Fog Research.....	1,441.57	.....	.....	372.70	1,050.00	18.80
Fog Research — Navy..	344.30	155.00	.....	195.92	.....	303.38
Network Analyzer	5,857.41	203,48	[2]1,416.32	938.24	1,416.32	5,122.65
Rockefeller Research ...	646.35	.....	.....	456.69	.....	189.66
Spec. Res.— Timoshenko	86.46	.....	.....	84.04	.....	2.42
Round Hill.....	269.16	72.00	.....	123.55	.....	217.61
Carnegie Cosmic Ray...	358.08	.....	.....	170.58	.....	187.50
Differential Analyzer ...	764.70	256.00	[1]2,400.00	29.39	2,400.00	991.31
Rapid Selection Res. ...	*70.00	14,515.56	[2]4,234.44	716.69	5,734.44	12,228.87
Rapid Selec. Res. Spec..	.....	.....	[2]1,500.00	786.07	.....	713.93
Blind Landing Res.	1,302.36	.....	[2]11,828.17	8,970.53	4,160.00	.....
Center of Analysis	.....	30,000.00	.....	.....	.....	30,000.00
Comm. Lab. Equip.....	.....	.....	[2]1,500.00	.....	485.10	1,014.90

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

Schedule R (*Continued*)

Name	*Balance June 30, 1938*	*Income*	*Other Increases or Transfers*	*Expenditures from Income Balances*	*Other Expenditures or Transfers*	*Balance June 30, 1939*
Electrical Engineering (*Continued*)						
Glass Fracture Res.	.....	$1,480.00	$[2]1,020.00	$347.76	$1,020.00	$1,132.24
Spec. No. 1450	.....	.....	2,000.00	.....	2,000.00	.....
Spec. No. 1450A Equip.	.....	.....	[2]300.00	.....	41.93	258.07
Spec. No. 1456 Trump	.....	700.00	[2]41.23	700.00	41.23	.....
Spec. No. 1541 — Radio Program	.....	.....	[2]5,000.00	.....	.....	5,000.00
Res. Corp. High Volt. Res.	$555.42	.....	[2]1,250.00	685.80	.....	1,119.62
Rock. Diff. Anal., No. 2	1,538.66	22.803.96	[2]6,100.00	23,299.99	6,100.00	1,042.63
Special No. 1269	417.19	.....	[1]500.00	125.70	500.00	291.49
Special No. 1182	142.47	.....	[1]1,124.02	142.47	1,124.02	.....
Special Nos. 1219, 1275	1,387.19	.....	[1'2]6,000.00	1,187.80	6,000.00	199.39
Special No. 1250	4,468.84	1,707.25	.....	4,863.74	.....	1,312.35
Genrado Trust	16,800.00	.....	.....	.....	7,300.00	9,500.00
Geology: Rockefeller Res.	218.49	.....	.....	172.90	.....	45.59
Special No. 1345	246.33	.....	.....	62.07	184.26	.....
N.Y.A. Spec. Shrock	.....	30.00	.....	30.00	.....	.....
Age of Earth Research	.....	.....	[2]4,800.00	.....	4,800.00	.....
Special No. 242–38	684.02	2,650.00	[2]884.26	3,518.28	700.00	.....
Special No. 1451	.....	.....	[1'2]900.50	.....	900.50	.....
Special No. 1246	432.59	.....	.....	432.59	.....	.....
Spectrograph Account	1,940.61	.....	.....	1,059.55	800.00	81.06
Haskins Fellowship	....	2,000.00	.....	2,000.00	.....	.....
Heat Engine Research	183.36	.....	.....	8.79	174.57	.....
Historic Memorials	118.82	.....	[2]131.27	118.82	131.27	.....
Housing Research	800.00	.....	.....	.....	.....	800.00
Hyams X-Ray Research	2,150.88	2,180.00	[2]2,297.42	4,808.30	1,820.00	.....
Hyams Radiation Project	.....	.....	[2]3.92	3.92	.....	.....
Hygiene Dept. Special	†1,363.12	66.64	.....	238.74	.....	†1,191.02
International Relations Lib.	189.57	.....	.....	34.88	.....	154.69
Jour. of Math. and Physics	804.41	361.55	[1]800.00	603.33	800.00	562.63
Keyes-Keenan Steam Table	119.61	2,400.00	.....	2,519.61	.....	.....
A.D.Little Mem.Inc.Acct.	32,333.90	11,176.25	5,510.82	9,700.00	3,637.50	35,683.47
Library: Special No. 1	119.45	13.20	.....	7.20	.....	125.45
No. 1508	.....	.....	[2]750.00	.....	186.69	563.31
Markle Cyclotron Res.	30,000.00	.....	[1'2]10,440.00	23,005.70	13,740.00	3,694.30
Math., Putnam Fund	.....	300.00	.....	.....	.....	300.00
Mechanical Engineering:						
No. 1412	.....	.....	[1]500.00	.....	500.00	.....
No. 1254	59.52	.....	[1'2]4,640.57	994.05	3,300.00	406.04
Special Res.	1,474.62	.....	[2]850.00	1,939.40	.....	385.22
Quoddy Project	688.11	.....	[2]153.50	627.96	.....	213.65
No. 1099 Air Cond.	1,713.25	.....	[2]5.33	.....	.....	1.718.58
A. S. M. E. Gear Res.	505.01	.....	.....	31.20	.....	473.81
Applied Mech. Congress	1,820.96	3,862.28	[1]1,500.00	4,837.05	1,500.00	846.19
Spec.No.1523 T.M.Lab.	.....	.....	[2]1,435.00	.....	479.76	955.24
Spec. No. 1555	.....	.....	[2]1,074.86	.....	.....	1,074.86
Nat. Aero. W., No. 372	17.16	.....	.....	.....	17.16	.....

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

Schedule R (*Continued*)

Name	*Balance June 30, 1938*	*Income*	*Other Increases or Transfers*	*Expenditures from Income or Balances*	*Other Expenditures or Transfers*	*Balance June 30, 1939*
Mechanical Engineering: (*Continued*)						
Nat. Aero. W., No. 465..	$886.96	.....	.....	$535.25	.....	$351.71
Nat. Aero. W., No. 550..	.....	.....	[2]$670.20	670.20	.....	.....
Nat. Aero. W., No. 563..	.....	.....	[2]1,232.94	1,232.94	.....	.....
Nat. Aero. W., No. 566..	.....	.....	[2]819.73	819.73	.....	.....
Nat. Aero. W., No. 567..	.....	.....	[2]1,523.20	653.20	$870.00	.....
Strength of Mat. Equip..	246.46	.....	.....	240.56	.....	5.90
Spec. No. 1333 Vib. Res..	28.35	$75.00	[1]500.00	94.95	500.00	8.40
Spec. No. 1366.....	1,165.60	.....	.....	1,165.60	.....	.....
Metallurgy:						
Special No. 1222.....	203.12	160.00	[1][2]3,680.00	563.00	3,480.00	.12
Magnetic Res.—Power .	1,500.00	.....	.....	.....	.....	1,500.00
Phelps Dodge Fell.....	89.17	.....	.....	67.71	.....	21.46
Silver Research.....	349.65	.....	.....	39.92	309.73	.....
Clay Research.....	.....	1,000.00	.....	15.63	.....	984.37
Chilled Iron Research ..	.....	1,000.00	[2]1,000.00	598.83	1,000.00	401.17
Special No. 1328.....	758.55	.....	[1][2]2,249.57	1,333.12	1,675.00	.....
Special No. 1337.....	748.20	565.00	[1]4,000.00	880.00	4,254.57	178.63
Special No. 1380.....	6,167.69	.....	[2]1,039.50	5,431.08	1,039.50	736.61
Special No. 1354.....	405.96	.....	[2]309.73	337.68	.....	378.01
Am.Inst.Min.& Met.Eng. O.H.Comm.Fell.....	.....	500.00	[2]100.00	.....	.....	600.00
Special No. 1259.....	279.93	.....	[2]636.85	.....	.....	916.78
Special No. 1129.....	*1,007.39	764.20	[1]1,500.00	.....	1,256.81	.....
American Welding Society Account	139.00	.....	.....	1.95	.....	137.05
Special No. 1234.....	255.92	874.94	.....	784.90	.....	345.96
Penrose Fund.....	.....	235.00	[2]600.00	103.89	600.00	131.11
Mining Engineering:						
Ore Dressing.....	22.39	.....	[2]715.38	.....	.....	737.77
Museum Committee,						
Special No. 1238.....	1,285.64	.....	[1][2]7,883.63	.....	6,177.74	2,991.53
Naval Architecture,						
Special No. 1377 — Towing Tank.....	357.45	.....	.....	300.20	.....	57.25
Special No. 1340 — Propeller Testing.....	11,311.43	.....	.....	11,259.39	.....	52.04
N. Y. Exhibit Spec. 1473 .	.....	.....	[1][2]3,200.00	.....	1,036.88	2,163.12
Nitralloy Corp. Acct.....	.....	.....	[2]100.00	.....	100.00	.....
Paper Museum.....	.....	.....	[1]7,500.00	.....	7,287.57	212.43
Placement Committee Fund	79.01	.....	.....	68.18	.....	10.83
Photographic Service.....	1,529.56	41,531.32	.....	42,998.75	.....	62.13
Photo. Lab. Fire — Ins. Acct.....	426.88	.....	.....	426.88	.....	.....
Physics Department:						
Nuclear Research.....	5,465.54	.....	[2]7,659.96	11,622.19	1,503.31	.....
Nuclear Building Acct. .	.....	.....	[2]3,120.00	.....	3,120.00	.....
Roentgen Ray.....	232.26	.....	.....	.....	.....	232.26
Hale Spectroscopic Fund	302.50	.....	.....	.....	.....	302.50
Rockefeller Special Res..	.....	1,250.00	[2]2,250.00	130.68	2,250.00	1,119.32
Milton Iodine Research.	51.61	1,100.00	[2]2,200.00	481.25	2,200.00	670.36
Rumford, Harrison No. 4	220.31	.....	.....	212.68	.....	7.63
Rumford, Hardy.....	120.72	.....	.....	.....	.....	120.72

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

Schedule R (*Continued*)

Name	*Balance June 30, 1938*	*Income*	*Other Increases or Transfers*	*Expenditures from Income or Balances*	*Other Expenditures or Transfers*	*Balance June 30, 1939*
Physics Department: (*Continued*)						
Rumford, Stockbarger ..	$380.02	.....	.....	$8.83	.....	$371.19
A. P. S. Res. Evans	.....	$3,000.00	.....	615.57	$2,141.90	242.53
Crystal Res.....	230.05	144.50	[2]$20.58	44.50	.....	350.63
Glass Industry Fell.....	500.00	.....	[2]1,000.00	.....	1,250.00	250.00
Radioactivity Res.	.....	15.00	[2]2,141.90	.....	.....	2,156.90
Carnegie Institute of Wash. Spec. Acct.	.....	3,000.00	.....	900.30	.....	2,099.70
Nat. Res. Council No. 1.85	.....	500.00	.....	233.07	.....	266.93
Spec. Special.....	1,108.13	519.15	[2]800.00	24.30	800.00	1,602.98
Polymerization Res.....	.....	.....	[2]150.00	.....	.....	150.00
President's Fund.....	926.16	.....	[1][2]2,021.75	1,447.91	1,500.00	.....
President's Special Fd.....	.....	5,000.00	.....	4,800.00	.....	200.00
Register Former Students	.....	.....	[1]2,000.00	.....	.....	2,000.00
Res. Corp. Function Unit Research.....	.....	4,936.00	[2]1,064.00	1,533.48	1,064.00	3,402.52
Research Corp. Arith.Mach.	.....	2,800.00	[2]1,200.00	253.11	1,200.00	2,546.89
Res.Assoc.M.I.T.1940	.....	1,250.00	.....	.....	.....	1,250.00
Research Assoc. of M.I.T. .	.....	12,750.00	[2]24,950.00	500.00	37,200.00	.....
Res.Corp — Vitamin C.Res.	259.95	.....	.....	121.44	.....	138.51
Res.Corp.Vit.A-D. Res....	.....	1,833.34	[2]666.66	105.60	666.66	1,727.74
Res.Corp.Metal. Treatment Research.....	.....	264.00	.....	264.00	.....	.....
Res. Corp. — Spec. Fellow	116.11	1,200.00	.....	1,316.11	.....	.....
R.O.T.C. Uniform Accts...	347.08	9,334.49	[2]9.66	9,184.75	9.66	496.82
Royalty Receipts — Patent 665135.....	476.19	1,156.57	.....	560.94	.....	1,071.82
Sailing Trophy Fund.....	84.50	.....	.....	80.98	.....	3.52
Society of Arts.....	.....	.....	[1]2,227.29	.....	2,227.29	.....
Solar Energy Sal. No. 1475.	.....	.....	[2]3,120.00	.....	2,446.65	673.35
Solar Energy Res.....	1,695.30	.....	[2]8,174.57	.....	3,292.98	6,576.89
Solar Energy Spec. No.1476	.....	.....	[2]2,000.00	.....	1,857.37	142.63
Special Prize Awards.....	.....	.....	[2]87.07	.....	87.07	.....
Special, No. 1166.....	55.72	115.00	.....	170.72	.....	.....
Special, No. 1433.....	.....	.....	[2]5,013.05	.....	5,013.05	.....
Special, No. 1434.....	.....	.....	[1]500.00	.....	500.00	.....
Special, No. 1446.....	.....	.....	[1]450.00	.....	450.00	.....
Special, No. 1454.....	.....	.....	[1]300.00	.....	149.97	150.03
Special, No. 1465.....	.....	.....	[2]4,974.63	.....	4,974.63	.....
Special, No. 1481.....	.....	.....	[1][2]1,013.49	.....	1,013.49	.....
Special, No. 1513.....	.....	.....	[2]6,700.00	.....	6,201.44	498.56
Special, No. 1543.....	.....	.....	[2]2,500.00	.....	.....	2,500.00
Special, No. 1546.....	.....	.....	[2]161.86	161.86	.....	.....
Special Research, No. 366.	439.32	.....	.....	439.32	.....	.....
S.S. 1938 Publication Expense	.....	.....	[2]729.56	.....	729.56	.....
S.S.1938 Spec. Conf.....	.....	.....	[2]1,500.00	.....	1,500.00	.....
S.S. 1938 Spec. Conf. Pub. .	.....	.....	[2]500.00	.....	.....	500.00
Special, No. 1329 — Student Shop.....	33.63	.....	.....	.....	33.63	.....
Special, No. 1547.....	.....	.....	[2]26.22	26.22	.....	.....
Special, No. 1548.....	.....	.....	[2]164.15	164.15	.....	.....
Suspense Accounts.....	*1,853.48	.....	[2]13,006.04	500.00	9,864.32	788.24
Suspense Acct. Worcester Property.....	1,609.12	.....	.....	.....	1,609.12	.....

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

Schedule R (*Continued*)

Name	*Balance June 30, 1938*	*Income*	*Other Increases or Transfers*	*Expenditures from Income or Balances*	*Other Expenditures or Transfers*	*Balance June 30, 1939*
Special, No. 1402	$50,609.45	$4.99	[1]$1,000.54	$50,614.44	$1,000.54	.....
Spec. No. 1510 Space Chgs.	.....	.....	[2]3,346.00	.....	1,576.08	$1,769.92
Spec.No.1540A Space Chgs.	.....	.....	[2]7,200.00	.....	304.48	6,895.52
Spec.No.1540B Space Chgs.	.....	.....	[2]882.82	.....	882.82	.....
Spec.No.1540C Equip.	.....	.....	[2]2,000.00	.....	.....	2,000.00
Spec.No.1542 Pres. Office	.....	.....	[2]2,500.00	.....	.....	2,500.00
Tech Press No. 1468	.....	3,366.11	.....	6.47	865.00	2,494.64
Tech Press Spec. No. 1468A	.....	457.80	[2]865.00	1,291.16	.....	31.64
Textile Res. School	.....	500.00	[2]200.00	500.00	200.00	.....
Textile Fd. Res. Spec.	.....	.....	[2]1,000.00	.....	828.00	172.00
Tree Planting Spec. No. 1464	.....	.....	[1]4,000.00	.....	4,000.00	.....
Tucker, Ross Francis Memorial Fund	200.00	40.00	.....	7.48	.....	232.52
Tyler Portrait Fund	559.64	.....	.....	.....	.....	559.64
Undergraduate Dues	331.60	.....	[1]21,126.00	331.60	21,126.00	.....
U. S. Navy Contract, No. 14091	.....	700.00	.....	246.50	153.50	300.00
Walker Memorial Library	99.50	.....	[2]3,300.00	.....	3,128.89	270.61
Totals	$257,111.50	$405,171.02	$416,509.64	$477,123.94	$346,735.44	$254.932.78
		(Schedule B)		(Schedule C)		(Schedule D)

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

SCHEDULE S

Current Surplus

Surplus, June 30, 1938	$1,359.03
Net Decrease (Schedule A)	842.18
Surplus, June 30, 1939 (Schedule D)	$516.85

Profit and Loss Account

Losses and Charges:

Students' Accounts charged off	$785.99
Rogers Building—final charges	189.87
Miscellaneous, charged off	190.87
Total	$1,166.73

Gains and Credits:

Premium Refund, Employees Insurance	$2,528.74
Tax Abatement, Huntington Avenue	1,320.92
1937–38 Salary Adjustment, Chemical Engineering Dept.	563.00
Real Estate Sale, Emery Fund	305.00
Miscellaneous Credits	689.60
Total	$5,407.26
Net Gain (Schedule A)	$4,240.53

THE ENDOWMENT FUNDS OF THE INSTITUTE

Including certain funds which have been wholly expended since 1916 for plant, equipment, facilities and special projects, not reported in Schedule K.

(See listing of Active Funds by groups on pages 184–190 with corresponding reference numbers, showing transactions during the year and balances as of June 30, 1939.)

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.

462 AMERICAN INSTITUTE OF BAKING FUND, 1939, $750. Contribution to provide a fellowship in Food Technology on problems relating to baking.

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.

172 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.

SIDNEY BARTLETT FUND, 1889, $10,000. Bequest. Appropriated for new dormitories, 1924.

173 STEPHEN L. BARTLETT FUND, 1939, $306,747.40. Bequest. Principal and income unrestricted.

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.

442 ALBERT FARWELL BEMIS FUND, 1938, $385,483.42. Bequest. To establish and maintain the Albert Farwell Bemis Foundation for research on housing.

ALBERT FARWELL BEMIS, 1923. $100,000. Gift. Used for new dormitory unit, 1923.

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.

STANTON BLAKE FUND, 1889, $5,000. Bequest. Used for educational plant, 1926.

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.

HOWARD A. CARSON FUND, 1932, $1,000. Bequest. Used for new equipment.

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.

WILLIAM L. CHASE FUND, 1925, $11,590.09. Bequest, $7,500 appropriated for Homberg Infirmary, 1927. Balance used for educational plant, 1928.

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.

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

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.

HELEN COLLAMORE FUND, 1917, $12,384.97. Bequest. Used for new dormitories, 1924.

SAMUEL P. COLT FUND, 1920–22, $20,000. Bequest. Used for new dormitories, 1924.

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.

EDWARD CUNNINGHAM FUND, 1917, $15,000. Gift. For new building and equipment at Civil Engineering Summer Camp, Maine.

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.

GEORGE B. DORR FUND, 1890, $49,573.47. Bequest. Appropriated for educational plant, 1918.

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.

CHARLES C. DREW FUND, 1920, $305,171.52. Bequest. Appropriation to educational plant, 1921–24.

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, $725,000 for New Rogers Building and Wind Tunnel in 1939.

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 (also from 1911 to 1923 Mr. Eaton gave $1,550.45 for Civil Engineering Summer Camp in Maine).

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.

584 WILLIAM EMERSON PRIZE FUND, 1939, $2,059. Contributed by friends as a fund for prizes to architectural students.

178 F. W. EMERY FUND, 1916, $120,000. Bequest. Used for buildings and equipment.

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.

IDA F. ESTABROOK FUND, 1926–37, $22,157.51. Bequest. Used for educational plant.

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.

Caroline L. W. French Fund, 1916, $100,843.34. Bequest. Used for new equipment, 1928.

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.

WALTER L. FRISBIE FUND, 1923, $7,614.98. Bequest. Used for educational plant, 1928.

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.

CHARLES W. GOODALE FUND, 1929, $50,000. Bequest. Used for new dormitory, 1930.

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. Unused balances available for purchase of apparatus and equipment in Department of Electrical Engineering.

181 GEORGE WYMAN HAMILTON FUND, 1935, $54,414.15. Appropriated for new equipment, 1937–38.

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.

CHARLES HAYDEN, 1925, $42,700.76. Gift. Used for educational plant.

CHARLES HAYDEN, 1927, $100,000. Gift for new dormitories.

309 JAMES HAYWARD FUND, 1866, $18,800. Bequest. Income for salaries.

183 JAMES W. HENRY FUND, 1935, $8,226. Bequest.

FREDERICK S. HODGES FUND, 1928, $57,316.26. Bequest. Appropriated for new dormitories.

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 Coöperation 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.

CHARLES C. JACKSON, 1912, $25,000. Gift. Used for purchase of new site.

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.

WILLIAM R. KALES, 1925–27, $11,000. Gift for new dormitories.

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.

DAVID P. KIMBALL FUND, 1924, $10,000. Bequest. Used for educational plant, 1926.

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.

JOHN M. LONGYEAR, 1915–16, $30,000. Gift. Used for land and equipment, 1916.

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.

ARTHUR T. LYMAN FUND, 1913, $5,000. Bequest. Used for educational plant, 1926.

JAMES MCGREGOR FUND, 1913, $2,500. Bequest. Used for educational plant, 1926.

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.

255 M. I. T. EMPLOYEES' FUND, 1938. Proceeds of employees' social activities held for benefit and relief purposes.

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.

JOHN LAWRENCE MAURAN FUND, 1934, $10,000. Bequest. Principal and income for benefit of Department of Architecture. Used, in part, toward house projects in Wellesley and Wakefield, 1937–38.

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.

HIRAM F. MILLS FUND, 1923, $10,175. Bequest. Appropriated for educational plant, 1937.

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

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.

EVERETT MORSS, 1916, 1921–25, $35,000. Gifts. For Walker Memorial murals.

264 HENRY A. MORSE NAUTICAL FUND, 1937, $3,500. Gift for maintenance of sailing activities and sailing pavilion.

ALBERT H. MUNSELL FUND, 1920, $7,908.28. Bequest. Used for educational plant, 1928.

MARGARET A. MUNSELL FUND, 1920, $1,105.32. Bequest. Used for educational plant, 1928.

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 Humanics.

MOSES W. OLIVER FUND, 1921, $12,870.49. Used for educational plant, 1938.

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.

EMERETTE O. PATCH FUND, 1935, $7,500. Bequest. Used for educational plant, 1938.

FRANK E. PEABODY FUND, 1920, $51,467.35. Bequest. Used for educational plant, 1921 and 1926.

NATHANIEL C. NASH FUND, 1881, $10,000. Bequest. Appropriated for new dormitories, 1924.

FRANCES M. PERKINS, 1912, $122,569.67. Bequest. Used for educational plant.

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.

E. S. PHILBRICK FUND, 1922, $36,213.92. Bequest. Used for educational plant, 1926.

PRESTON PLAYER FUND, 1933, $20,000. Bequest. Used for educational plant, 1938.

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.

CHARLES O. PRESCOTT, 1935, $30,640.78. Principal and income used for educational plant, 1938.

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.

275 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.

RUSSELL ROBB FUND, 1928, $28,750. Bequest. Appropriated for new dormitories, 1930.

ROCKEFELLER FOUNDATION RESEARCH FUND, 1931–36, $170,000. Contributed and expended for Research in Science Departments 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.

277 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.

THEODORE EDWARD SCHWARZ MEMORIAL FUND, 1937–38, $4,391.86. Gift. For equipment of a suitable room for proposed map collection.

279 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.

RICHARD B. SEWALL FUND, 1919, $30,000. Bequest. Used for educational plant, 1924.

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.

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.

281 LILLIE C. SMITH FUND, 1937, $4,800. Bequest to M. I. T. Women's Association for purposes of the Association.

283 WALTER B. SNOW, 1938, $7,500. Reserve funds of Technology Christian Association. Deposited for investment purposes.

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.

CHARLES A. STONE, 1912–24, $15,000. Gift for land $25,023.59, 1928. Gift for dormitories.

GALEN L. STONE, 1912, $10,000. Gift for land, 1916, $10,000. Gift for Mining Building.

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 TEAS 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.

STURGIS H. THORNDIKE FUND, 1928, $15,000. Bequest. Appropriated for new dormitories, 1930.

NATHANIEL THAYER, 1906, $25,000. Gift. Used for educational plant.

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.

ELIHU THOMSON, 1912, $25,000; 1924, $5,000. Gift. Used for purchase of land.

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.

LUCIUS TUTTLE FUND, 1916, $50,000. Bequest. Used for educational plant, 1918.

636 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.

637 THOMAS UPHAM FUND, 1939, $302,794. Bequest of Marcella B. Upham. Principal to be held as a permanent trust fund, the income to be used in assisting poor and deserving students or graduates of the Institute.

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.

HORACE W. WADLEIGH FUND, 1916–20, $22,143.14. Bequest. Appropriated for new buildings, 1924.

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.

EDWIN S. WEBSTER FUND, 1912–24, $15,000. Gift. Used toward purchase of land.

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.

CHARLES G. WELD FUND, 1907, $15,000. Gift. Used for educational plant, 1924.

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.)

ALEXANDER S. WHEELER FUND, 1907–16, $30,000. Contributed by friends. Used for new dormitories, 1924.

GEORGE R. WHITE FUND, 1912, $10,000. Gift. Used toward purchase of new site.

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.

GEORGE WIGGLESWORTH, 1917–24, $65,000. Gift. Used for additional land purchase, 1924.

577 ELIZABETH BABCOCK WILLMANN FUND, 1935, $5,065. Bequest. Income to be used toward tuition of young women students taking Chemistry courses.

KENNETH F. WOOD FUND, 1926, $25,000. Bequest. Appropriated for new dormitory, 1930.

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.

AUDITOR'S 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, 1939, and we report thereon as follows:

The investment accounts at June 30, 1939, were checked in detail with lists of securities at that date, certified by the Old Colony Trust Company of Boston, Massachusetts, custodian, and by examination or test of the accounts and supporting records we verified the other assets and the liabilities shown in the Treasurer's Balance Sheet, Schedule D. The collectibility in full of one account receivable for research (approximately $39,000.00) is not presently determinable.

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, with the supporting schedules, present fairly, on the basis indicated, the financial condition of the Institute at June 30, 1939, and the 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 for the year to include the transactions of the Hewett and George S. Witmer Funds, of which the Massachusetts Institute of Technology acts as Trustee, and satisfied ourselves that the provisions of the Trust Agreements had been fulfilled.

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

The investment accounts of the Hewett and Witmer Funds and of the Massachusetts Institute of Technology Pension Association at June 30, 1939, were also checked in detail by us with lists of securities at that date certified by the Old Colony Trust Company of Boston, Massachusetts, Custodian.

Respectfully submitted,

PATTERSON, TEELE & DENNIS,
Accountants and Auditors.

1 Federal Street, Boston, August 11, 1939.

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, 1939, and we submit herewith their certificate dated August 11, 1939.

Their full report covers the books of the Massachusetts Institute of Technology, the Hewett Fund, and the George S. Witmer Fund of both of which the Massachusetts Institute of Technology acts as Trustee.

The report also covers the account of the Massachusetts Institute of Technology Pension Association.

Respectfully submitted,

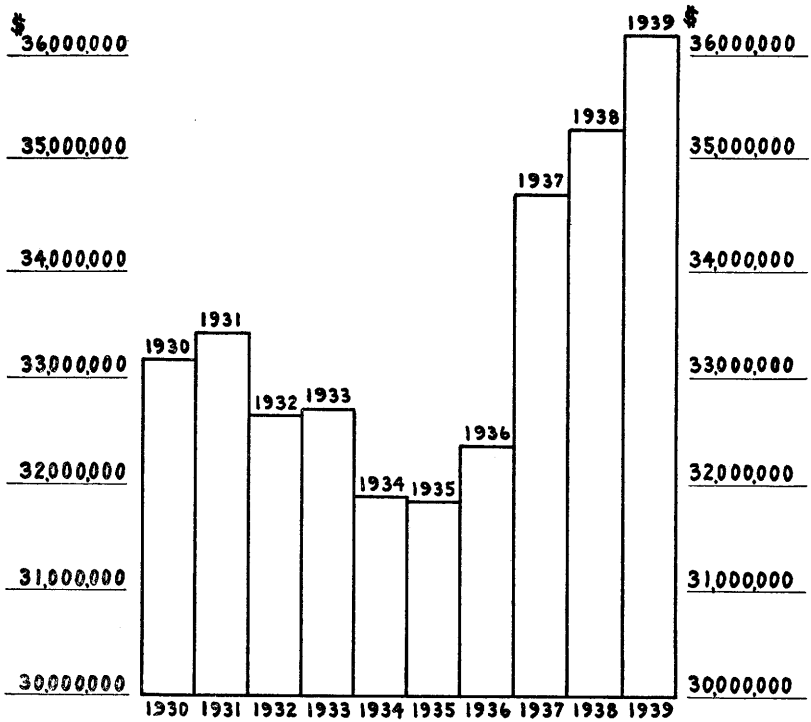
J. WILLARD HAYDEN,
DONALD G. ROBBINS,
MARSHALL B. DALTON, *Chairman.*

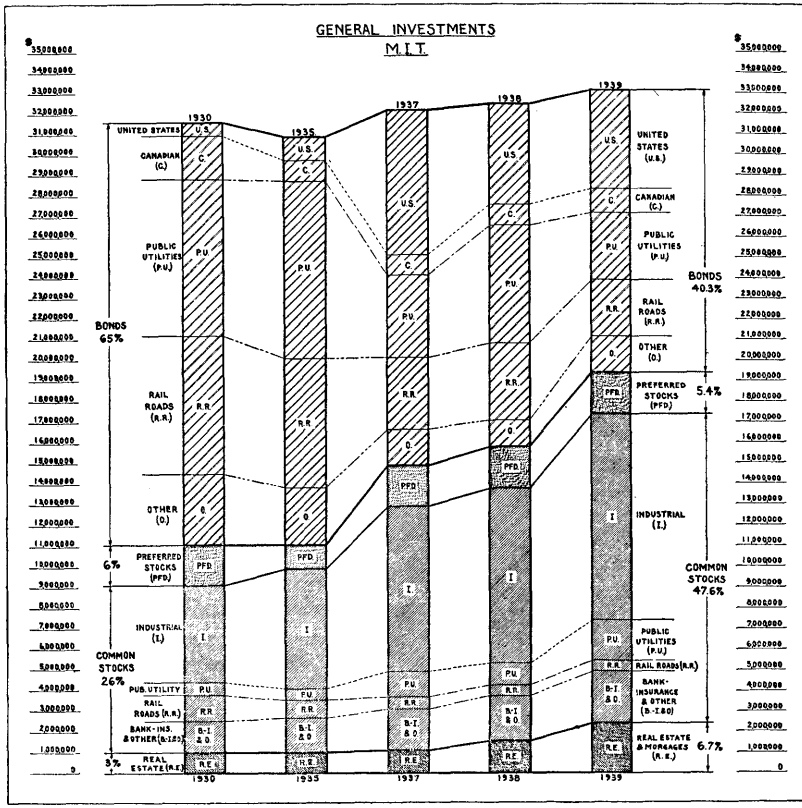
August 21, 1939.

SUPPLEMENT TO REPORT OF TREASURER

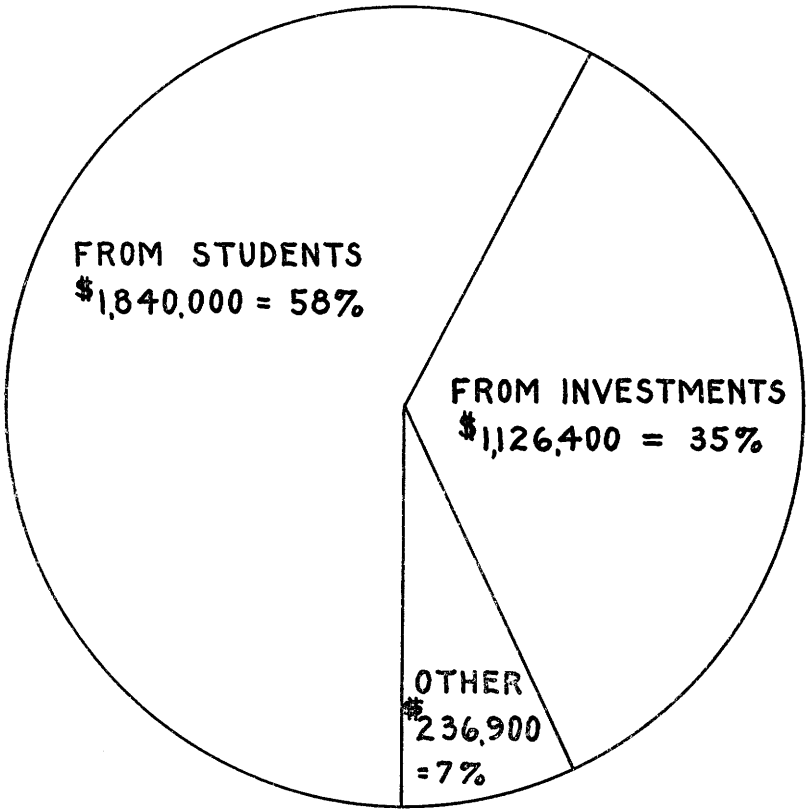
GRAPHS AND CHARTS SHOWING RECENT TRENDS IN INSTITUTE FINANCES AND SUMMARIZING THE YEAR'S OPERATIONS

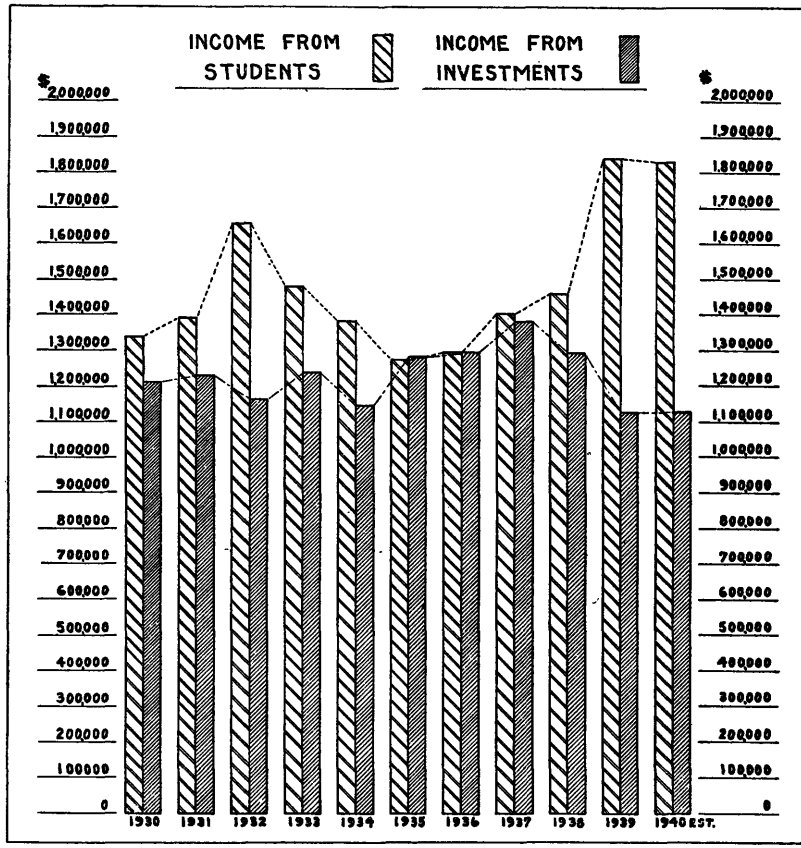
ENDOWMENT FUNDS AT END OF YEAR

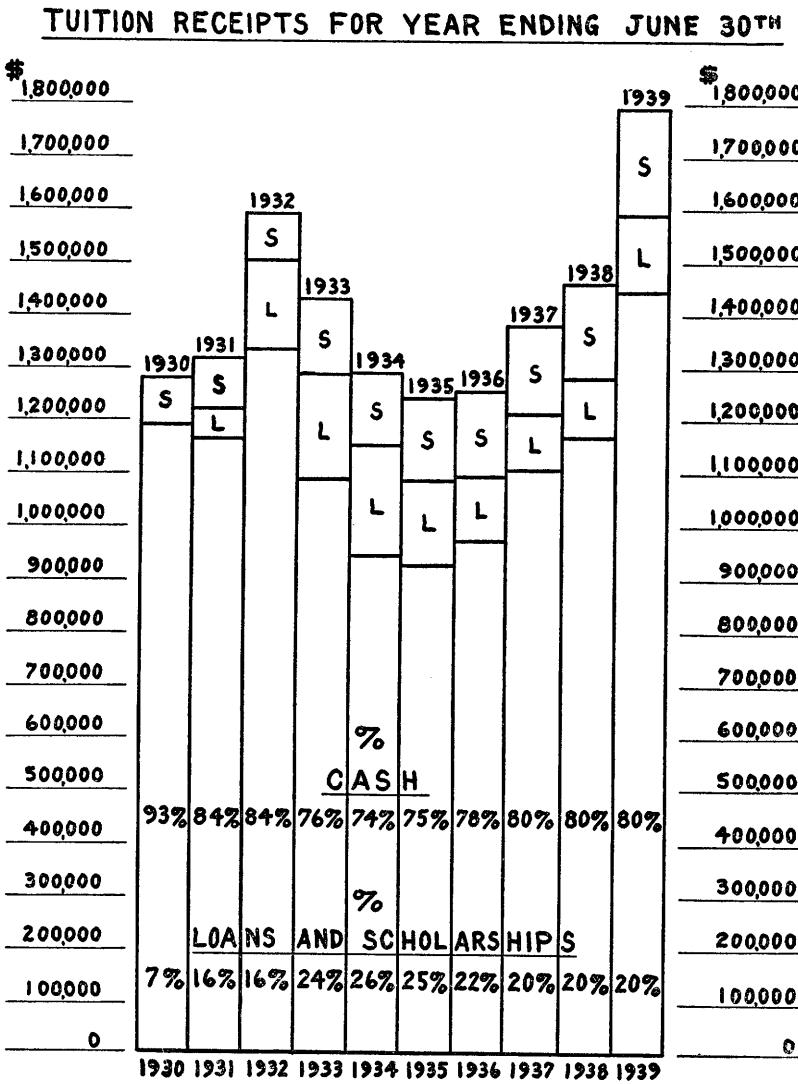



GENERAL INVESTMENTS
M.I.T.
1930
1935
1937
1938
1939
UNITED STATES
CANADIAN (C)
PUBLIC UTILITIES (P.U.)
RAIL ROADS (R.R.)
OTHER (O)
PREFERRED STOCKS (PFD)
INDUSTRIAL (I)
PUB. UTILITY
RAIL ROADS (R.R.)
BANK-INS. & OTHER (B-I&O)
REAL ESTATE (R.E.)
BONDS 65%
COMMON STOCKS 26%
6%
3%
UNITED STATES (U.S.)
PUBLIC UTILITIES (P.U.)
RAIL ROADS (R.R.)
BANK-INSURANCE & OTHER (B-I&O)
REAL ESTATE & MORTAGES (R.E.)
BONDS 40.3%
5.4%
COMMON STOCKS 47.6%
6.7%

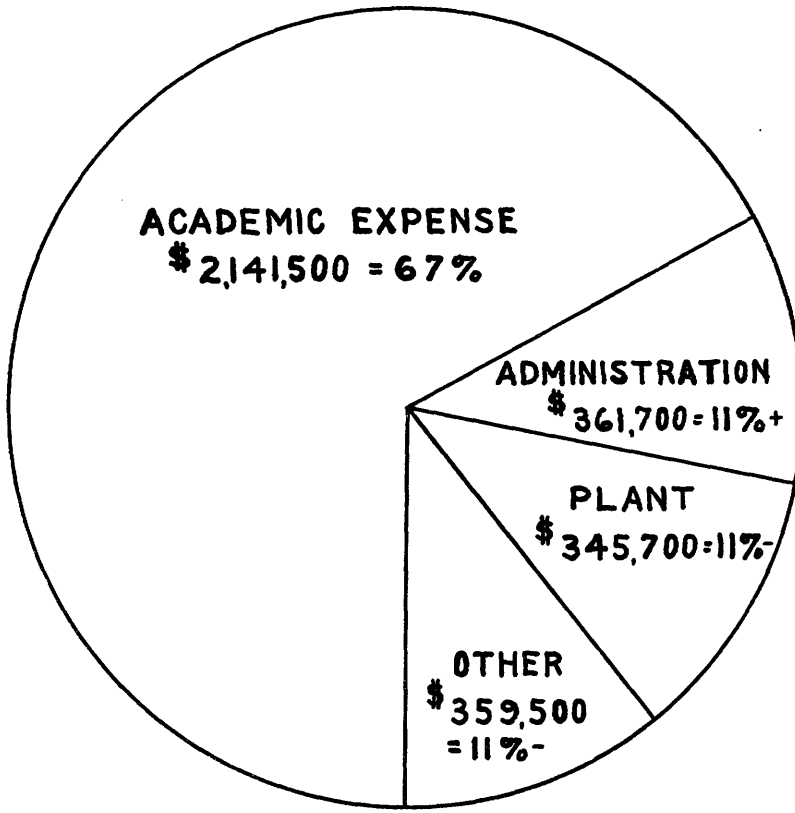
BUDGETED INCOME 1938-1939

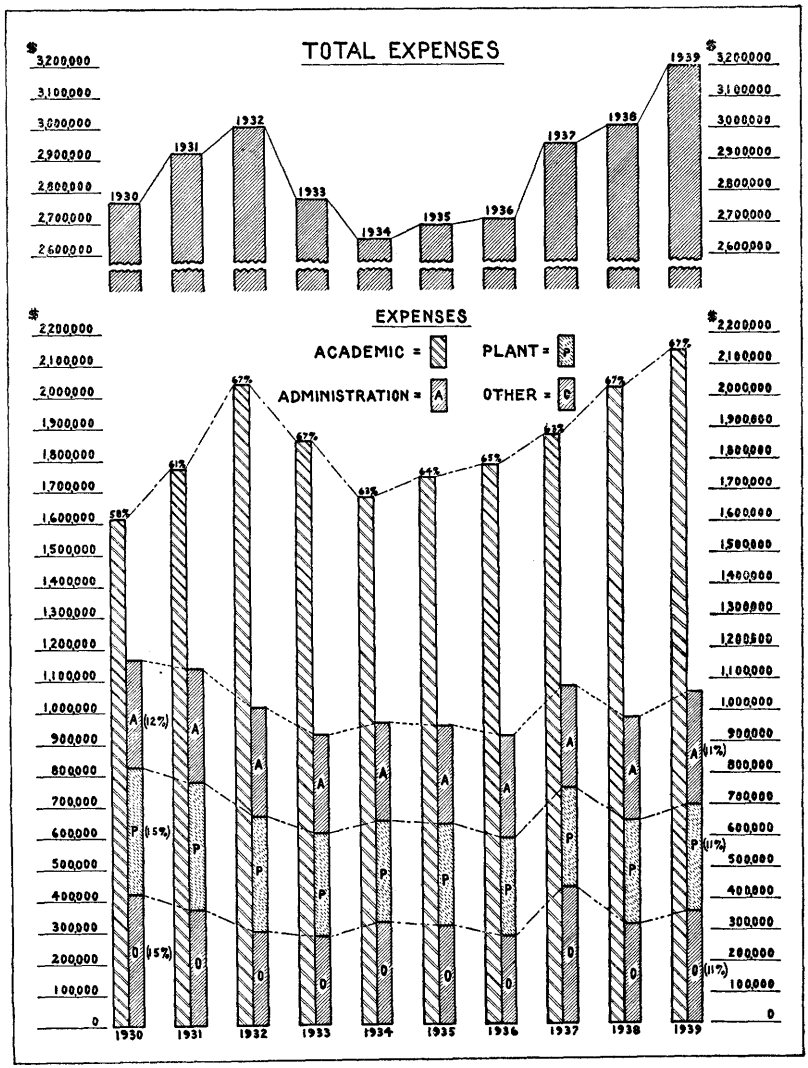



INCOME FROM STUDENTS
INCOME FROM INVESTMENTS
$
2,000,000
1,900,000
1,800,000
1,700,000
1,600,000
1,500,000
1,400,000
1,300,000
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940 EST.

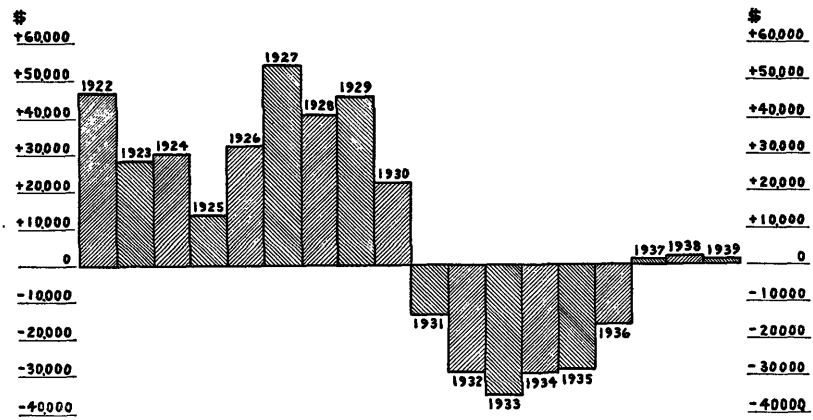

TUITION RECEIPTS FOR YEAR ENDING JUNE 30TH
$1,800,000
1,700,000
1,600,000
1,500,000
1,400,000
1,300,000
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
S
L
93% 84% 84% 76% 74% 75% 78% 80% 80% 80%
% CASH
7% 16% 16% 24% 26% 25% 22% 20% 20% 20%
% LOANS AND SCHOLARSHIPS

BUDGETED EXPENSE 1938-1939




TOTAL EXPENSES
$3,200,000
3,100,000
3,000,000
2,900,000
2,800,000
2,700,000
2,600,000
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
EXPENSES
ACADEMIC = A
PLANT = P
ADMINISTRATION = A
OTHER = O
$2,200,000
2,100,000
2,000,000
1,900,000
1,800,000
1,700,000
1,600,000
1,500,000
1,400,000
1,300,000
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
58%
61%
67%
67%
63%
64%
65%
67%
67%
67%
A (12%)
P (15%)
O (15%)
A (11%)
P (11%)
O (11%)

SURPLUS (OR DEFICIT) RESULTING FROM CURRENT OPERATIONS
AT END OF FISCAL YEAR



PERIODICAL PUBLICATIONS, BOOKS AND REVIEWS BY MEMBERS OF THE STAFF

DEPARTMENT OF AERONAUTICAL ENGINEERING

1. CALDWELL, FRANK W. *The Hydromatic Propeller.* (United Aircraft Bee Hive, 1938. Also Aviation *37*, p. 28, July 1938.)

2. DRAPER, CHARLES S. and MORSE, PHILIP M. *Acoustical Analysis of the Pressure Waves Accompanying Detonation in the Internal-Combustion Engine.* (Proc. Fifth Int. Congress for App. Mech. p. 727, 1939.)

3. DRAPER, CHARLES S., COOK, W. H. and MCKAY, WALTER. *Northerly Turning Error of the Magnetic Compass for Aircraft.* (J. Aero. Sci. *5*, p. 345, July 1938.)

4. DRAPER, CHARLES S. and SCHLIESTETT, GEORGE V. *General Principles of Instrument Analysis.* (Instruments *12*, p. 137, May 1939.)

5. HOUGHTON, HENRY G. and RADFORD, WILLIAM H. *On the Local Dissipation of Natural Fog.* (Papers in Phys. Ocean. & Meteor. *6*, 63 pp., October, 1938.)

6. HOUGHTON, HENRY G. and RADFORD, WILLIAM H. *On the Measurement of Drop Size and Liquid Water Content in Fogs and Clouds.* (Papers in Phys. Ocean. & Meteor. *6*, 31 pp., November 1938.)

7. ISELIN, COLUMBUS O'D. *Some Physical Factors Which May Influence the Productivity of New England's Coastal Waters.* (J. Marine Res. *2*, pp. 74–85, June 21, 1939.)

8. NAMIAS, JEROME and WEXLER, H. *Mean Monthly Isentropic Charts and Their Relation to Departures of Summer Rainfall.* (Trans. Am. Geophys. Union, Nineteeneth Annual Meeting, pp. 164–170, 1938.)

9. NAMIAS, JEROME. *The Forecasting Significance of Anticyclonic Eddies on the Isentropic Chart.* (Trans. Am. Geophys. Union, Nineteenth Annual Meeting, pp. 174–176, 1938.)

10. NAMIAS, JEROME. *Technique and Examples of Isentropic Analysis.* (Papers in Phys. Ocean. & Meteor. *7*, pp. 18–71, December 1938.)

11. NAMIAS, JEROME. *The Use of Isentropic Analysis in Short Term Forecasting.* (J. Aero. Sci. *6*, pp. 295–298, May 1939.)

12. NEWELL, JOSEPH S. *Symmetric and Anti-Symmetric Loadings.* (Civil Eng. *9*, pp. 249–251, April 1939.)

13. NEWELL, JOSEPH S. *Use of Symmetric and Anti-Symmetric Loadings.* (J. Aero. Sci. *6*, pp. 235–239, April 1939.)

14. PETERS, HEINRICH and RIGHTMIRE, BRANDON G. *Cavitation Study by the Vibratory Method.* (Proc. Fifth Int. Congress for App. Mech., p. 614, 1939.)

15. RAUSCHER, MANFRED. *Steady Forced Oscillations of Permanent Non-Linear Systems.* (Proc. Fifth Int. Congress for App. Mech., p. 681, 1938.)

16. RAUSCHER, MANFRED. *Steady Oscillations of Systems with Non-linear and Unsymmetrical Elasticity.* (J. App. Mech. *5*, p. A-184, December 1938.)

17. RAUSCHER, MANFRED. *Discussion: Steady Oscillations of Systems with Non-linear and Unsymmetrical Elasticity.* (J. App. Mech. *6*, p. A-91, June 1939.)

18. REISSNER, ERIC. *On Tension Field Theory.* (Proc. Fifth Int. Congress for App. Mech., p. 88, March 1939.)

19. REISSNER, ERIC. *Note on the Statistical Theory of Turbulence.* (Proc. Fifth Int. Congress for App. Mech., p. 359, March 1939.)

20. REISSNER, ERIC. *Remark on the Theory of Bending of Plates III.* (J. Indian Math. Soc. *3*, p. 200, March 1939.)

21. ROGOWSKI, AUGUSTUS R. and BOUCHARD, CONSTANT L. *Scavenging a Piston-Ported Two-Stroke Cylinder.* (N.A.C.A. Tech. Note No. 674, November 1938.)

22. SIKORSKY, IGOR I. *The Story of the Winged-S.* 266 pp. (Dodd, Mead and Company, 1938.)

23. SMITH, RICHARD H. *Curvilinear Dynamics of Airships Based on Bowed Models.* (Proc. Fifth Int. Congress for App. Mech., p. 606, 1938.)

24. SMITH, RICHARD H. *Laminar Boundary Layer Based on a Minimum Theorem.* (J. Aero. Sci. *5*, May 1938.)

25. TAYLOR, EDWARD S. and BENTLEY, G. P. *Gas Pressure Torque of Radial Engines.* (J. Aero. Sci. *6*, November 1938.)

26. TAYLOR, EDWARD S. and BROWNE, K. A. *Vibration Isolation of Aircraft Power Plants.* (J. Aero. Sci. *6*, December 1938. Also Proc. Fifth Int. Congress for App. Mech., p. 656, 1938.)

27. TAYLOR, EDWARD S., REYNOLDS, B. and SCHECTER, H. *The Charging Process in a High Speed Four-Stroke Engine.* (N.A.C.A. Tech. Note No. 675, February 1939.)

28. WARNER, EDWARD P. *Pamphlets: (1) The Early History of Air Transportation. (2) Technical Development and Its Effect on Air Transportation.* (Norwich University 1938.)

29. WRIGHT, THEODORE P. *Curtis-Wright Model 20 Transport.* (Aviation *37*, p. 28, August 1938.)

30. WRIGHT, THEODORE P. *American Methods of Aircraft Production.* (J. Royal Aero. Soc., London, *43*, p. 131, March 1939.)

31. WRIGHT, THEODORE P. *America's Answer — Gearing the Aircraft Industry to National Defense.* (Aviation *38*, p. 26, June 1939.)

DEPARTMENT OF ARCHITECTURE

32. CHAMBERLAIN, SAMUEL. *Lexington and Concord.* (Hastings House, New York, June 1939.)

33. CHAMBERLAIN, SAMUEL. *Nantucket.* (Hastings House, New York, June 1939.)

DEPARTMENT OF BIOLOGY AND PUBLIC HEALTH

34. BLAKE, CHARLES H. *An Unexpected Visitor. (Clausilia Nigricans).* (N. E. Naturalist, p. 6, December 1938.)

35. BLAKE, CHARLES H. *They Attack Wood.* (Tech. Rev. *41*, p. 123, January 1939.)

36. BLAKE, CHARLES H. *The Flight of Hummingbirds.* (N. E. Naturalist, p. 1, June 1939.)

37. BLAKE, CHARLES H. *The Late Spring.* (N. E. Naturalist, p. 27, June 1939.)

38. BUCHWALD, CHARLES E., COOPER, FRANKLIN S., HASKINS, CARYL P. and EVANS, ROBLEY D. *Electron Bombardment of Biological Materials.* (Rev. Sci. Inst. *10*, pp. 73–77, March 1939.)

39. BUNKER, JOHN W. M. and HARRIS, ROBERT S. *A Reappraisal of Vitamin D Milks.* (N. E. Jour. Med. *219*, pp. 9–12, July 7, 1938.)

40. CONNOLLY, JOEL I. and Collaborators. *Hygiene of Housing.* (Ninth Annual Year Book, Am. Pub. Health Assn., pp. 27–29, February 1939.)

41. DUNN, CECIL G. *A Comparative Study of Some Antiseptics and Germicides with Special Reference to Alkyl-Dimethyl-Benzyl Ammonium Chlorides.* (Am. J. Surgery *41*, pp. 268–271, August 1938.)

42. DUNN, CECIL G. *Evaluation of Germicides.* (Soap and Sanitary Chemicals *15*, p. 97, April 1939.)

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