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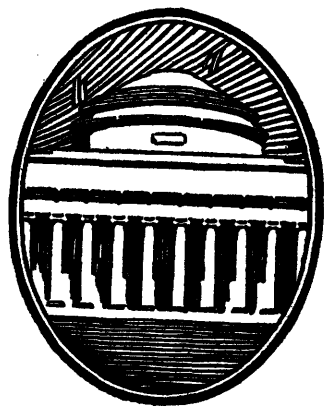

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

President's Report

FOR THE YEAR 1929–1930

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REPORT OF THE PRESIDENT

TO THE MEMBERS OF THE CORPORATION:

In accordance with the by-laws of the Corporation I have the honor to submit to you a report for the past year, covering changes in personnel, the more important points of progress in the work of the various departments, and reports of other administrative officers with reference to the work of their offices.

During the year the Corporation has lost two of its Life Members. Mr. Samuel M. Felton, who died on March 11, 1930, had been a Life Member for forty-three years, and Mr. Otto H. Kahn, who resigned on June 6, 1930, had served fourteen years. In the death of Mr. William E. Nickerson, a Term Member, on June 5, 1930, the Corporation lost one of its most loyal members.

The term for which Messrs. Andrew G. Pierce, Jr., Salmon W. Wilder and John L. Mauran were elected expired in June, and the Corporation elected Messrs. Godfrey L. Cabot, William D. Coolidge and Redfield Proctor to serve as Term Members for five years.

A change in the by-laws was effected, creating the position of Chairman of the Corporation, to which the President was elected, and Dr. Karl T. Compton, a well-known physicist and head of the Department of Physics at Princeton University, was elected President of the Institute, both appointments taking effect on July 1, 1930.

This new arrangement marks an important step in the administrative affairs of the Institute consistent with the growth and the diversity of its interests.

Other changes were the separation of the course in Engineering Administration from the Department of Economics and Statistics, and the forming of a new department of Business and Engineering Administration, and the combination of the Departments of German and Romance Languages into the Department of Modern Languages.

An important action was taken by the Faculty in the reorganization of the curriculum of the first year. A study of the second year curriculum is in progress.

The registration increased for the third successive year and passed the three thousand mark. This is not an inflated growth but is a gradual, healthy increase, which will probably continue notwithstanding the raise in tuition from $300 to $400 which took place in 1928, and the further increase from $400 to $500 authorized to take effect in October 1931. An encouraging fact to be noted is the increase in the number of applicants qualifying for admission to the freshman class for four successive years; the numbers being 495, 592, 668 and 693. The real significance of this increase lies in the opportunity afforded the Institute to be more selective in the applicants it accepts.

The administration of the Dean's Office has been very satisfactory and disciplinary cases were very few indeed. In the report of last year mention was made of the mortality studies being carried out by the Director of Admissions and the Dean. These have been extended and seem to indicate that the present entrance examination method of selecting freshmen provides the best available means of measuring intellectual promise.

Concern for student health has long been a part of the Institute's program and the Homberg Infirmary has again demonstrated its value in providing means of safeguarding the health of students.

During the year a new dormitory was started which will be ready for occupancy this fall and will bring the total dormitory capacity of the Institute up to 630. This new unit will provide a maximum of comforts without luxury.

The administration of the dormitories has been outstandingly successful due to the coöperation and good feeling which exists between the undergraduate student dormitory government and the Dormitory Board representing the Administration.

Bulletin No. 23 of the Carnegie Foundation for the Advancement of Teaching, giving the result of a three-year study of college athletics throughout the United States, has been published. Of the many institutions canvassed in the study less than twenty received an entirely favorable report, and among these was the Institute. This report is peculiarly gratifying in view of our unique method for the control of athletics wherein the ruling voice is delegated to the student body.

Scholarship funds for aiding worthy students have existed at the Institute for many years. Comparatively small loan funds have also been available. The establishment of the Technology Loan Fund provides for a further extension. In the future, with scholarship aid and the liberal provisions of the Technology Loan Fund, the Institute's necessarily high tuition fee need not constitute an insurmountable barrier to students of ability but of limited financial means.

Because of unsatisfactory scholarship, 227 students were dismissed by the Faculty during the year. The number dismissed in the three previous years were 147, 146 and 145 respectively. The relatively high number dropped during the past year reflects the growing conviction that early elimination of those unsuited for Institute work makes for the best interests of all concerned.

The number of students pursuing courses leading to higher degrees was 421, the largest in the history of the Institute. In this group were citizens from forty-one states of the Union and twenty-six foreign countries. One hundred and fifty-one colleges, universities and technical schools, of which twenty-four were outside the United States, were represented. The Departments of Chemistry, Chemical Engineering and Electrical Engineering continue to attract the largest enrollment of graduate students. Graduate students were, however, registered in every department of the Institute. It is interesting to note that nearly 60 per cent of all graduate students received their Bachelor's degrees at other institutions than Technology.

The number of advanced degrees awarded at the end of the year was 198 distributed as follows:

Doctor of Philosophy	9
Doctor of Science	19
Doctor in Public Health	1
Master of Science	163
Master in Architecture	7

It is to be regretted that graduate students have so little opportunity of meeting others engaged in advanced study and research outside of their own particular fields of work, and it is hoped that the various groups may be brought together by providing a suitable dormitory exclusively for graduate students.

Two changes of importance were made in the curriculum of the Department of Civil Engineering. A new option in Geodesy and Seismology was established and the transportation option was expanded to include subjects in air transportation.

The Geodesy and Seismology option provides for an extension of the geodetic work conducted by the Department. It will provide for training in seismology based upon fundamental physics and engineering subjects.

In view of the fact that the civil engineer is responsible for the design of dams, bridges and high buildings, it is fitting that the forces applied to such structures by earthquakes should be understood and taken into account in the design.

The design of a seismograph which will withstand severe shocks is in progress. The work will be carried on in coöperation with officials of the United States Coast and Geodetic Survey.

Researches are in progress and advanced instruction in Soil Mechanics is being offered — work in which foundation engineers are very much interested and are coöperating. The United States Bureau of Public Roads is actively engaged in researches jointly with the Institute.

A laboratory has been established in connection with the work in Sanitary Engineering. The Massachusetts State Association of Master Plumbers is actively interested, holding its annual conventions at the Institute, and financing researches. It is a field in which there is a great need for scientific and technical work of a high order.

A series of lectures upon hydraulic turbines and related subjects in water power plant design was given at the Institute by Dr. Ing. D. Thoma, professor of hydraulics and Director of the Hydraulic Institute of the Technische Hochschule at Munich. Dr. Thoma is recognized as one of the foremost authorities in the design of hydraulic machinery, and his lectures attracted much interest from engineers in Boston and other parts of the country.

At the end of the year there was the usual demand for graduates of the Department of Mechanical Engineering. All seniors and candidates for higher degrees had secured positions before graduation. About fifty per cent more could have been placed had they been available.

The Department has enlarged its laboratory for the testing of materials and added the new equipment necessary to carry on graduate instruction and fundamental research.

Dr. H. Hencky, of the University of Delft, a noted expert in the theory and properties of structural materials, was added to the staff of the laboratory. He will give advanced instruction and carry on researches of the greatest importance in the field of structural and engineering materials.

The Department has established excellent relations with technical societies and industrial concerns. These are coöperating in the work of instruction and research and have contributed a large amount of equipment. Leading engineers and representatives of industry freely contribute their services in the form of special lectures.

The work in connection with textiles is growing rapidly. The staff is coöperating with the textile industries as to the type of men and scientific data needed. This section is becoming more and more of assistance to that industry.

The Head of the Department of Mechanical Engineering was appointed a member of the State Plumbing Commission by the Governor, and is rendering most important assistance in the revision of the plumbing regulations and practices in the state.

In the Department of Mining Engineering and Metallurgy, production metallurgy has to do with the separation of metals from their ores, while physical metallurgy is concerned with the properties of metals and their alloys.

The work in physical metallurgy has gradually been brought together in the mining building as a branch of the Department of Mining and Metallurgy. This field of metallurgy has become of great importance and has grown more rapidly than experts can be trained in the subject.

Great advances are being made in the field of physical metallurgy such as the development and use of ferrous alloys, including stainless steel, high-speed tool steel, and the various alloys for structural purposes. These have revolutionized industries.

Developments in the non-ferrous field, including the light alloys which are now being used so extensively, have been no less marked. Instruction and investigation are of such importance that the Institute should further develop this field.

There is an increase in the number of students registering for the work, and the demand for expert physical metallurgists still exceeds the supply. Important researches are now in progress by graduate students and the instructing staff. Additions have been made to the space and equipment for the work, as far as possible in its present quarters. Attention has been called heretofore to the urgent necessity for suitable quarters in which to develop the heavier laboratory work incident to this field of metallurgy. Several important contacts have been made with the metallurgical industries, and there is every reason to believe that some of these will coöperate with the Institute in establishing the work in physical metallurgy on a basis commensurate with its importance to industry and the development of this relatively new science.

A few years ago the Faculty authorized the Department of Electrical Engineering to adopt tentatively the Honors Group plan, whereby students of exceptional ability were to be allowed more freedom in the selection of professional subjects and given work in accordance with their ability.

During the year a detailed report on the results obtained under this plan was made to the Faculty by the Department and authorization was given to continue the plan as a permanent part of its educational program. While it may not be practicable or possible to adopt the identical procedure in all departments, the plan, or a modification of it, should be put into effect in several departments.

Another educational precedent set up by the Electrical Engineering Department is the senior colloquia held by men from industry who are recognized as leaders in the various branches of electrical engineering. These have proven a source of great inspiration especially to Honors students and staff.

Lectures, particularly for the freshmen and sophomores registered in electrical engineering, have proved valuable in acquainting these students with the various branches of that profession. In these the electrical industries have freely coöperated.

The importance of graduate study continues to increase. Fifty-three graduate degrees were conferred upon students of the electrical department, of which six were doctors. This graduate work has resulted in a number of important researches

during the year, notably in the fields of circuit theory, machine transients, dielectrics, illumination and communication acoustics. The Department has by far the largest graduate school of electrical engineering in the country. It has established a laboratory of communication acoustics for research and instruction. The illumination laboratory has been extended and equipped with additional apparatus.

The Integraph — a mechanical analyzer, developed by members of the Department — has assisted in the solution of difficult problems in connection with over thirty researches in the electrical and other departments.

The Network Analyzer, originated in the Department, is a device whereby an electrical duplicate in miniature of a power system may be set up for studying problems concerning the distribution of electric power in network systems. It is being made use of by industry in the solution of practical problems and by the Institute in important researches completed or in progress. The need of the Department for additional space is still urgent.

The year brought many evidences of confidence in the Department of Architecture from different sources, the most conspicuous of which came in the form of an anonymous gift of $100,000, the income of which is to be used in aiding students of particular promise to enjoy the opportunities of the Department. The family of Henry L. Newhouse established a travelling scholarship.

Graduates of the Department won the Rotch, the Guy Lowell, the Kelley and the Paris prizes; the latter is perhaps the most coveted award among architectural students and was won for the third time in four years.

The question of Town Planning has become of the utmost importance. While primarily a question of architecture it involves many engineering problems as well. The Department of Architecture is well equipped and located for instruction in this field, and would be greatly strengthened by the coöperation of the various engineering departments. It is urgently recommended that provision be made for such work in the Department of Architecture at the first opportunity.

The increased interest in American shipping has been reflected in the activities of the Department of Naval Archi-

tecture, and the number of students taking the course has increased.

Considerable work has been done on the plans for the proposed experimental tank, both as to building and equipment. The Department is in a position to proceed with the work as soon as funds are available. The need of this tank for instruction and research in the training of naval architects has long been evident. Industrial interests are concerned in having available a towing tank with equipment for handling the conditions found today as to speed and design.

The Institute possesses the leading course in Naval Architecture in the country. An increasing interest is being shown by American shipping organizations in the course in ship operation.

The United States Navy continues to send Junior officers selected for the Construction Corps to the Institute for training. It is of course incumbent upon the Institute to maintain the equipment of this Department on a modern and adequate scale. The Visiting Committee of the Department has been actively coöperating with the Department in this question.

The Nautical Museum continues to attract the interest of the public as well as students of Naval Architecture. Two interesting models have been acquired — one, the "Christianus Quintus," constructed from original drawings for the Institute by a famous Danish model maker. It is therefore a historically accurate representation of a battleship at the beginning of the eighteenth century. The other model is that of Hendrick Hudson's boat, the *Half Moon*, in which he explored the Hudson River. These, with the model of the *Santa Maria* and the *Mayflower*, form an interesting group of ships associated with the history of America.

Owing to the rapid increase in the aviation industry and the consequent demand for trained men, the staff in aeronautical engineering lost its leader and several important members at the end of the previous year. Fortunately, it was possible to secure excellent men to fill the vacancies.

The aerodynamic and power plant work were both placed under the direction of Professor C. F. Taylor, and the work has been most admirably handled both as to instruction and research.

A five-foot wind tunnel fitted with a new automatic balance was installed during the year and has proven very satisfactory both for instruction and research.

In the field of aerodynamics an important investigation was completed on the stability of rigid airships by the use of curved models. Other investigations included an investigation of the forces on the leading edge of air foils on slotted wings, and a determination of data for improving the design of high wing monoplanes.

In the field of aircraft power plants, three important investigations were completed, (1) on radial engine crank shafts, (2) valve action under supercharging conditions, and (3) the control of detonation and carburetion of heavy fuel oil. Those in progress include important investigations in connection with the high-speed Diesel engine cycle, and a study of air flow as a cooling device in internal combustion engines.

The staff has coöperated with the National Advisory Committee for Aeronautics, with Government Bureaus and the industries. Several very creditable papers by members of the staff have been issued during the year.

The course in Building Construction continues to show a normal growth, the enrollment for the year being ninety-seven as compared with eighty-seven for the year preceding. Twenty-one men were graduated in June, and most of them found positions without undue delay.

The course is adequate to prepare the students for advanced positions in the various departments of the building industry. For many years builders have complained that the graduates of technical schools were of little use to them because they are not acquainted with the use and assembly of materials although they may be competent to solve problems in structural design, in which the builder is not particularly interested. The special training in the course is intended to overcome this difficulty and to prepare young engineers for the problems and conditions met by the builder.

The Department has established most useful relations with a number of the most prominent builders of the country, all of whom are actively interested in the course and the manner in which it is presented. Some thought is being given to advanced work since there is a large field for research in building con-

struction, in which many methods now accepted as the best practice are wasteful and uneconomic.

The Horowitz prize was awarded to R. A. Bisson.

Laboratories for research and experimental hydraulics are frequently found in European technical educational institutions. These laboratories are equipped with facilities for experimental work in the field of power development, turbines, rotary pumps, propellers, river and harbor control, dams, and other branches of hydraulic engineering.

It is surprising that little or none of certain phases of this work such as river flow and control has been provided for in this country, where there are as many or perhaps more opportunities of employing it to advantage as in any country in the world.

In order to inspire an interest in it at the Institute, several of the most prominent hydraulic engineers of Europe have been called in as lecturers. Several graduate students and an instructor were sent abroad to study in foreign laboratories. The temporary building previously used for an internal combustion engine laboratory is now utilized for the purpose of developing the hydraulic work. Through the generosity of Mr. Aldred in furnishing equipment, some very creditable researches were completed during the year and others are in progress. Much more work is being requested by engineers and others than can be cared for. The research work is being placed on a self-supporting basis as far as possible. Plans are in preparation for permanent quarters based upon the experiences of foreign laboratories and our own developments.

In general it may be stated that in the Division of Municipal and Industrial Research the number of field surveys completed, compensation for field work, public notice received and contacts made during the present year shows a gratifying increase. While the work of the Division has to a large extent developed along lines previously followed, certain new trends in the industrial survey field have had to be recognized and methods modified accordingly. Thus, while the Division has not discarded entirely the practice of making complete industrial inventories in its surveys, it has been evident that greater effectiveness results through concentration on the more pertinent phases of the survey. This applies whether the work

includes the preparation of a comprehensive report by our own staff or the supervision of field work done by others.

During the year the Division has completed five surveys as follows:

Summary Report of Bangor-Brewer, Maine — completed August, 1929.

Industrial Survey of New Hampshire — completed December, 1929.

Industrial Survey of Baton Rouge, La. — completed February, 1930.

Report on Municipal and Industrial Conditions in Somerville, Mass. — completed June, 1930.

Industrial Survey of Vermont — completed July, 1930.

Work in progress includes an industrial survey of El Paso, Texas, which will probably be completed by the early fall.

It will be noticed that four of the above studies relate to individual communities, whereas two are regional in character. The community studies were all locally financed, either by business groups, by the municipality, or by both; the regional surveys were financed by a public utility organization. It is planned to make of the work a training field for graduate students interested in such surveys.

The course in Chemical Engineering continues to be one of the most popular in the Institute. Its graduates are occupying leading positions in industry. Its Research Laboratory of Applied Chemistry is one of the most important contacts the Institute maintains with industry, and its School of Chemical Engineering Practice, with sub-stations in leading centers, is a most successful method of coöperative training. The demand for men trained in the field of Chemical Engineering is rapidly increasing, and the present indications are that the registration for the coming year will greatly exceed that of any previous one.

For several years, this Department has been most inadequately housed, especially as to laboratory space. The establishment of graduate chemical work in new quarters will provide some additional classrooms but little laboratory space for Chemical Engineering. Furthermore, some of the Department's experimental work is carried on in temporary quarters which are inadequate, unsightly, and not fireproof.

Attention has often been called to the urgent need for laboratory space of a simple character for the heavy laboratory

work in Chemical Engineering, especially that involving high pressures and temperatures or heavy equipment. The cryogenic work of the Department of Chemistry also involves high pressures and temperatures. The work in connection with the Materials section of the Division of Industrial Coöperation and Research, such as ceramics and the building materials, requires laboratory space of this character.

The Department of Fuel and Gas Engineering has tried to keep in mind the need for continuous modification of the subject matter of its courses to keep pace with the rapid changes made in the industrial processing and utilization of fuels.

The Department has taken over the instruction in the Automotive Fuels Course, formerly given by the Chemical Engineering Department.

Two important research projects have been initiated during the year. The first is a study of the mechanism of powdered coal combustion, from the standpoint of specific reaction rate at the surface of the individual particle. The second, an investigation sponsored by two large groups of public utilities companies, consists of the development of a method of calibrating large capacity gas meters in place, and a method of calibrating moderate sized industrial gas meters.

Encouraging progress was made in a number of research projects. The work on furnace design was reported in a paper on radiant heat transmission, presented to the Second World Power Conference. Experimental progress in the project of non-luminous gas radiation measurement was paralleled by mathematical research on the problem.

Research on the elimination of carbon monoxide, smoke and odor from automotive engine exhaust gases led to the development of a device which is capable of supplanting the muffler of an automotive engine, and which eliminates the undesirable constituents of the exhaust gases by auxiliary combustion.

The course in Fuel and Gas Engineering has been developed in two or three basement laboratory rooms and some important problems have been solved. Related industries are becoming interested in the work, and in the training of men in this field. This work also calls for additional laboratory space.

There have been no radical changes in the mathematics courses. The list of electives and graduate courses has been in-

creased by the addition of Algebra of Quantum Theory. The number of undergraduate courses has been increased by two subjects given for second and third year students in physics.

Particularly significant has been the completion of the requirements for the doctorate by four candidates, the largest number for a single year in the history of the Department.

The retirement of Professor Tyler led to the appointment of Professor Woods as head of the Department. Professor Tyler's connection with the Department dates from his graduation from the Institute in 1884. He was appointed Head of the Department in 1901 and has brought the Department of Mathematics to a high standard, recognized as such by mathematicians throughout the country.

In the Department of Physics there has been a rearrangement of the first year curriculum in order to provide a material increase in the time allowed for this important fundamental subject.

That portion of the work in the field of X-rays which has to do with physical metallurgy has been transferred to the section of physical metallurgy.

Professor Norton who has been head of the Department since 1922 has resigned and will devote his time wholly to the Division of Industrial Coöperation and Research which has been so ably developed by him since he assumed charge in 1921.

The additions that were made to the Physics staff at the end of the year, especially the selection of Dr. John C. Slater as head of the Department, will strengthen both the undergraduate and graduate work and ensure the development of a graduate department commensurate with the fundamental importance of the subject.

The limitation of space has retarded the development of graduate work. Nevertheless, the Department has carried on creditable researches, both in experimental and theoretical physics, in rapidly increasing numbers. The new physical laboratory is to be devoted entirely to graduate work.

It is gratifying to note that there has been a further increase in the number of students taking the Physics course, the total number of undergraduates being fifty-three, and the number of graduate students sixteen.

As in the year previous, a number of prominent physicists

have given lectures, principally in the field of theoretical physics, to graduate students and members of the staff.

For several years the Department of Chemistry has called attention to the inadequate facilities for handling the courses in Chemistry required of all freshmen. During the first term of the year 649 students had to be accommodated in laboratories fitted to take care of but 560.

The number of students receiving instruction in Organic Chemistry was not greater than the previous year owing to the lack of quarters. Fortunately, this condition will be remedied upon the completion of the new laboratory for graduate work in chemistry which will make available more space for undergraduate work in the quarters originally provided for it.

The number of students applying for graduate study in the Department of Chemistry has steadily increased, but the acceptance of greater numbers was not possible under existing conditions. The new laboratory will provide adequate additional space for graduate work.

There is no lack of interest in research, and with the new facilities it is certain that the contribution to science by the Department will be of increasing value and the supply of trained investigators in the fields of chemistry be increased.

It is not possible in this brief résumé to give an account of the interesting work accomplished by the Department. There is one case, however, which is cited as an example of the far-reaching results of such investigations.

Several years ago the Institute was asked by the American Society of Mechanical Engineers to take up the work of producing certain scientific data needed in the extension of the steam tables to higher ranges of pressure and temperature. This work has been carried on with great success. A member of the staff was invited to present these results at the second International Conference on the Properties of Steam held in Berlin last June. It is a source of satisfaction to state that the values adopted for the properties of high pressure steam were substantially those obtained in our own research laboratory of physical chemistry under the direction of Dr. Keyes.

The number of graduate students in Chemistry was forty-six, of which thirty-three were candidates for the doctor's de-

gree. Ten were awarded graduate degrees during the year, five of whom received the degree of Doctor of Philosophy.

In the Department of Biology and Public Health, the year has been one of consistent growth with increased registration for both graduate and undergraduate instruction. Some changes were made in the undergraduate curriculum in order to coördinate certain subjects more advantageously with the advanced work in bacteriology and biochemistry.

Food Technology is a rapidly growing field of great importance in which the Department of Biology has done excellent work with the limited facilities and staff available. The demand for well trained men in this field is far greater than the supply. This work presents an opportunity for the Institute to do a great public service which it cannot afford to overlook.

The work of the Department in the field of public health and health education has been well received by industrial organizations and public authorities. The growth of the Department emphasizes the urgent need of more adequate quarters for both instruction and research. A laboratory and provision for its maintenance would be a most suitable recognition of the services of the late Professor Sedgwick, one of the most useful and best known men ever connected with the Institute.

The Department of Geology has grown in size and in its relations with other departments.

During the year there have been registered in the Course in Geology eight graduate, ten undergraduate and three special students. Two candidates were awarded the degree of Doctor of Philosophy in Geology. The Department has given instruction to one hundred and seventy students from other Courses and has offered two geological subjects as General Studies.

The course in Meteorology, established two years ago, was made necessary on account of the great need for more scientific data and trained experts in this field. A knowledge of storms and air currents, and the underlying causes is absolutely necessary to the safety of aerial navigation. Both instruction and research have been well organized, have progressed satisfactorily, but the staff should be increased and additional equipment should be provided.

During the year there has been a steady advance in the more specialized work of the staff engaged in instruction in

business management and allied subjects. Researches have been made in the field of economic production analysis, the results of which will shortly appear in book form, and a new project has been undertaken with regard to the measurement of management in order to provide material for instruction in a new graduate course.

As a continuation of the previous research, specific economic production quantity problems in various types of industry have been investigated.

During the second term a group of twenty-five senior students engaged in a thesis research under the supervision of the Department and with the collaboration of the New England Council. A variety of problems were undertaken, and summaries of the findings were presented to the Council.

A graduate subject "Manufacturing Analysis," was offered for the first time. A new member of the staff has been carrying on research in a number of progressive establishments concerning policies and methods of industrial marketing in preparation for a graduate course to be given during the coming year. Another member of the Department has been carrying on field work in the preparation of a graduate course in industrial traffic management.

Special effort has been made to develop the instruction in the accounting courses in order to give more emphasis to the interpretive side rather than the mechanical.

Two new graduate courses were laid out to replace courses already in the catalogue. The first of these covered the important fields of analysis and interpretation of business statements, and the second covered the problem of obtaining adequate control of a business enterprise through accounting records.

The course in Engineering Administration was separated from the administrative responsibility of the Department of Economics and Statistics, and a new Department of Business and Engineering Administration was created. The successful results obtained by the course of Engineering Administration, under the able leadership of Dr. Dewey, indicate that the establishment of this work as a department will bring about a closer contact with business interests and the development of broader curricula including graduate work.

The Department of Economics and Statistics, which gives instruction in all courses, will continue its teaching program, the value of which is recognized as a part of the curricula.

The placing of junior students in supervised summer employment has been given further emphasis. Despite the depression, the Department was successful during the summer in placing students and the periods of employment were increased.

The revision of the first-year curriculum in English by the Faculty has effected a change whereby the course in which the emphasis is on history, the work in composition being subordinate, will be replaced by one in which training in the writing of English will be the main purpose. The size of the sections will be reduced, and in making up sections, students of the same degree of proficiency in composition will be grouped together and special attention will be given to those who prove to be deficient in the fundamentals of the subject. All members of the Department will take part in giving this course.

A change in the second-year curriculum will undoubtedly be made looking forward in a general way to the further emphasis on the English considered necessary to the engineer and the scientist from both the technical and cultural viewpoints.

The Department of German and that of Romance Languages were combined under one head as formerly. For the first time in several years Italian, discontinued during the war, has been announced for next year. The interest in German, French and Spanish continues to increase. Engineers are realizing more than ever the importance of being able to read the technical literature of the day, and the growing international character of contacts with co-workers in their own fields.

The Summer Session has gradually taken on the character of an academic term in which both undergraduate and graduate courses are offered. The former are more often made use of by students who wish to take additional work in four years than by those who are required to make up deficiencies.

Graduate courses are available to instructors of other institutions during vacation, as well as to our own students.

The number of students shows a substantial increase over the previous year. Greater opportunities were offered for graduate work. The Summer Session is gradually becoming a center of colloquia and conferences in particular fields of science or

technology in which technical and industrial men are interested.

The Electrical Engineering Colloquia, the Industrial Gas Course and the course for Ordnance Officers given during the summer session, are illustrations.

The Institute is taking an active part in assisting young men, prospective college students and their parents to comprehend what the fields of modern science and technology are. These efforts on the part of the Institute have taken several forms. The Director of Admissions and committee of instructors lecture before the students of preparatory schools when requested as to what the fields of modern science and technology are; not primarily for the purpose of enlarging the attendance at the Institute, but as an aid to these young men in the selection of, and preparation for, the life work for which they are by nature fitted, for in this there is the best prospect for success and happiness.

Another very successful effort in this direction is the annual *Open House*, when ten or twelve thousand school boys of various ages, their parents and friends, visit the Institute. We welcome the parents and their friends, but it is the school boys whom we are delighted to serve, and perhaps be the inspiration of some future Faraday or Thompson. In this there is the most cordial coöperation of all departments of the Institute.

The third of these activities is perhaps the most far-reaching in the direction of aiding young men in the choice of a career or rather in the development of natural talent. It will be recalled, that the original plan of the Institute included in addition to a School of Technology and a Museum, a Society of Arts. The purposes of this Society, as then defined, are being largely accomplished at the present time by national and local engineering and scientific societies.

Never before have the general public and preparatory school pupils been so keenly interested in science and its applications. Hence, a popular science lecture course was established some years ago as a proper and useful function of the Society of Arts. The lectures, four each year, well illustrated, are given at the Institute by experts. They are open to pupils of the secondary schools in and about Boston, on Friday and Saturday afternoons, and to the general public on Sunday afternoons.

During a recent visit to Europe an opportunity was

afforded for visiting the well-known Deutsches Museum at Munich. It would be difficult for one to form an idea of the extent of this institution or its far-reaching educational value without seeing it. This opportunity came on a rainy day, not a holiday, and yet the attendance was six or seven thousand, few of them American tourists. A large number of the visitors were young people and the eagerness with which they examined the various exhibits was one of the most inspiring sights of the institution. This again recalls the fact that the founders of the Institute had in mind the establishment of such a museum. The Institute is preserving, and to a certain extent collecting, early equipment of historical value in technical fields. The proper housing of this and the collecting of modern materials of educational value to students in Technology would form the nucleus of a museum of great value to the Institute, and to the public.

Attention is again called to the need for a gymnasium and an auditorium; the former is needed in connection with indoor physical training and athletics; the latter is essential for convocations of students, public lectures and other general exercises. The present general lecture room is too small for this purpose and is in constant use for regular lectures in physics and chemistry, for which it was designed.

A building for the use of the Faculty would serve many useful purposes besides housing its social activities; such facilities now considered desirable as a part of the equipment of higher educational institutions go far toward promoting an *esprit de corps* among the members of the Staff and good relations between that body and the public. It is recommended that this be provided as soon as possible.

Two members of the Faculty who retired a year ago have died — Professor W. S. Franklin and Professor A. S. Jenney.

Professor H. W. Tyler, Head of the Department of Mathematics, retired on July 1, with the title "Professor Emeritus." Other losses in the Faculty have been occasioned by the resignation of the following: Colonel H. E. Cloke and Professor Charles R. Gow; Associate Professors P. K. Frolich, J. L. Gillson, Hale Sutherland; Assistant Professors H. G. deLaszlo, G. V. Slottman, R. A. Wilkins, Lieutenant E. E. Barnes, Captain V. W. Hall, Lieutenant A. T. W. Moore, and Major S. S. Winslow.

The following additions have been made to the Faculty: Dr. John C. Slater has been appointed Professor of Physics and head of the Department; George R. Harrison, Professor of Physics; Thomas R. Camp, Associate Professor of Civil and Sanitary Engineering; Dr. Heinrich Hencky, Associate Professor of Mechanics; Lieut. C. L. Adcock, Major Robert Arthur and Major P. H. Ottosen were appointed Assistant Professors of Military Science and Tactics; Jesse Douglas, Assistant Professor of Mathematics; R. M. Langer, Assistant Professor of Physics; Manfred Rauscher, Assistant Professor of Aeronautical Engineering; and T. K. Sherwood, Assistant Professor of Chemical Engineering.

The following Associate Professors have been advanced to the grade of Professor: C. E. Locke, J. W. Phelan, C. H. Porter, M. deK. Thompson and G. B. Wilkes.

Professor F. S. Woods has been appointed Head of the Department of Mathematics in place of Professor Tyler, retired. Professor E. H. Schell has been appointed Acting Head of the new Department of Business and Engineering Administration.

The following Assistant Professors have been advanced to the grade of Associate Professor: Philip Franklin, F. A. Magoun W. H. Newhouse, J. T. Norton, C. E. Tucker and M. S. Vallarta.

The following have been made Assistant Professors: A. D. Beidelman, E. W. Brugmann, W. V. Cash, C. M. Cooper, R. D. Douglass, R. F. Elder, R. D. Fay, N. H. Frank, O. Ingraham, T. A. Mangelsdorf, L. F. Marek, J. R. Markham, B. E. Proctor, C. L. Svenson, E. R. Schwarz, E. J. Tauch, B. E. Warren and E. F. Watts.

The following are more detailed accounts of the various departments:

Civil and Sanitary Engineering. Two changes of some importance have been made in the curriculum and are to become effective in the year 1930–31; namely, the establishment of a new option in Geodesy and Seismology, Option 4; and the addition to the Transportation Option of a new group of subjects in the fourth year relating to Air Transportation. Research work has been continued in the fields of soil me-

chanics and hydraulics, and a plumbing laboratory has been established. These matters are discussed in detail in the body of this report.

The option in Geodesy and Seismology provides an extension of the geodetic work which has been conducted by the Civil Engineering Department for many years. The option is intended to furnish scientific training in the geodetic and seismological field superimposed on a background of fundamental civil engineering subjects. In view of the fact that the civil engineer must be responsible for the design of structures such as dams, bridges and high buildings which have to resist earthquakes, it is fitting that the forces applied to such structures by earthquakes should be treated in a civil engineering course; hence, the inclusion of seismology in this new option.

A Wenner seismometer was ordered in January 1929 and when comp eted will be installed at Camp Technology, making the camp the only seismograph station in the northeastern section of the continent, the two nearest stations being Ottawa, Canada, and Cambridge, Massachusetts. Had this seismograph been in service in November 1929, when the severe earthquake occurred in the Bay of Fundy district, it might have afforded valuable data.

A Research Associate has been appointed who is devoting his attention to the development of a seismograph which will withstand severe shocks without being put out of commission as has occurred with the more delicate seismographs in common use.

The conduct of this option will be under Professor Hosmer, who is recognized as an authority in the geodetic field in this country, and the work will be carried on in close touch with the officials of the United States Coast and Geodetic Survey.

Students in the Transportation Option of the Civil Engineering Course have, during recent years, had the option of taking in the fourth year, in addition to the basic engineering subjects required of all civil engineering students, a group of subjects relating either (a) to railway transportation, or, (b) to highway transportation. During the coming year, another group of subjects will be available; namely, Group (c), relating to air transportation. Students who choose the option in Air Transportation will be required to take certain subjects in the

Aeronautical Department in order to give them an aeronautical background, and the subject of Structural Design will be modified to include a problem in the analysis of airplane stresses. Other subjects required of all students in the Transportation Option deal with the fundamental problems occurring in the design and construction of airports, hangars, and the like, and require no change.

Research work in Soil Mechanics in coöperation with the Bureau of Public Roads of the United States Department of Agriculture was continued for the fourth successive year. During the year an investigation of Atterberg's limit tests, which was started three years ago, was finished and assembled in a report for publication; and the results of an investigation on the hydrometer method for rapid mechanical analysis of fine grained soils were also prepared for publication. A new method for the rapid determination of the permeability of soils by measurement of the rate of capillary saturation was devised and thoroughly investigated. This method bids fair to be of great value for measuring or checking in the field the permeability of large numbers of soil samples in connection with dam construction or when investigating the drainage conditions of a locality. A new machine for measuring the shearing resistance of clay soils was designed and constructed. This testing machine incorporates the experience gained with several different types of shearing devices which are at present in use at the Institute and in European laboratories, and is so constructed as to eliminate certain serious defects of former machines. Recent experience has shown that a clay in its natural state has properties which are fundamentally different from those of the same clay disturbed; consequently, an extensive research program on this subject was started.

Coöperative agreements were also made during the year between the Institute and the city of Hartford and between the Institute and the Corson Construction Corporation of New York City.

Under the first of these agreements, a series of tests was conducted in the newly established River Hydraulic Laboratory for the purpose of determining the suitability of certain materials for use in the construction of a large dike along the Con-

necticut River in the city of Hartford. These tests involved consideration of both hydraulic and soil problems.

The investigation made for the Corson Construction Corporation was for the purpose of analyzing under controlled conditions the results of field tests made along the line of the new Houston-Essex Subway in New York City to furnish a basis for estimating the settlements to be expected in the completed structure. The tests were made in the Retaining Wall Laboratory.

Researches being conducted in the River Hydraulic Laboratory include one made at the suggestion of the Massachusetts Department of Public Works upon a model of a section of the Connecticut River near Northampton, Massachusetts, for the purpose of investigating the erosion of the river banks, and one upon a model of a dam on the Mongaup River, New York, in order to devise a method of improving the scour conditions below the dam apron.

In pursuance of the agreement made last year between the Institute and the Massachusetts State Association of Master Plumbers, a plumbing laboratory has been established and equipped with apparatus for conducting tests upon plumbing apparatus and its installation.

A series of ten lectures upon "Hydraulic Turbines and Related Subjects in Water Power Plant Design" were given in October by Dr. Ing. D. Thoma, Professor of Hydraulics, Water Power Machinery and Water Power Plants, and Director of the Hydraulic Institute at the Technische Hochschule of Munich, Germany. During this period, a paper was also presented by Dr. Thoma upon "Kaplan Turbines at the Ryburg-Schworstadt Plant on the Upper Rhine" at the quarterly meeting of the American Society of Civil Engineers which was held in Boston, October 9–11. Dr. Thoma is recognized as one of the leading authorities on the design of hydraulic machinery and his lectures attracted much interest from engineers in practice, not only in Boston, but also in other sections of the country.

The fourth annual two-day conference of the Massachusetts State Association of Master Plumbers was held at the Institute under the auspices of the Department on February 18 and 19. These conferences are now participated in by the Massachusetts Sanitary Club in addition to the Master Plumb-

ers Association. The membership of the Massachusetts Sanitary Club is made up of manufacturers and distributors of plumbing supplies as well as of master plumbers.

New appointments during the year include that of Thomas R. Camp as Associate Professor of Sanitary Engineering. Professor Camp was graduated from the Texas Agricultural and Mechanical College with the degree of B.S. in 1916, and from the Institute with the degree of S.M. in 1925. In addition to his scholastic work, Professor Camp has had a considerable amount of professional experience, particularly in the field of sewerage engineering, and is well qualified to undertake the direction of the Sanitary Engineering Course.

C. Hale Sutherland, Associate Professor of Structural Engineering, resigned at the end of the year to accept the position of Professor of Civil Engineering and Head of the Department of Civil Engineering at Lehigh University.

John B. Drisko returned to the Institute in January, after having spent a year and one-half in study in the hydraulic laboratories of Europe as the holder of an Institute traveling fellowship.

Forty-eight students attended the nineteenth session of the Surveying Camp at East Machias during the summer of 1930. This registration was twenty-five less than in 1929. The charge per student for meals and miscellaneous expenses necessary for the operation of the camp was $1.96 per day as compared with $1.84 in 1929. The total charge of these items was $100 per student.

The instructing staff consisted of Professors Hosmer, Howard, Babcock, Fife, and Mr. Mitsch of the regular instructing staff; Professor Bowler I, '14, Head of the Civil Engineering Department of the University of New Hampshire, and the following student assistants: Messrs. E. F. Childs, M. P. Thomas, H. B. Turner, and L. Pachon-Rojas. Dr. Harland F. Lancaster, who was Resident Physician in 1927 and 1929, acted in the same capacity during the session.

The class in Mining Surveying, held at the Summer Mining Camp at Dover, N. J., was attended by ten students. The instruction was under the general direction of Mr. W. C. Eberhard, Instructor in the Division of Drawing, assisted by Mr. F. Leroy Foster, Instructor in the Mining Department.

Mechanical Engineering. During the year there was the usual demand for graduates from the Mechanical Engineering Department; all seniors and men who took higher degrees were placed before graduation. The call was such that forty or fifty more men could have been given employment had they been available. Some of the large industries have asked to be kept informed concerning outstanding men who have graduated from the Institute and who may be available from time to time.

About a year ago space vacated by the Metallurgical Laboratory was allotted to the Mechanical Engineering Department for use as a research laboratory for the testing of materials. A sixty thousand pound Riehle Universal Testing machine was installed in this laboratory, and recently a sixty thousand pound Emery Tatnall Hydraulic machine has been added. A Vickers Hardness Testing machine and a Herbert Hardness Testing machine have been added to the equipment, as well as five Huggenberger Tensometers.

During the year members of the staff in the Testing Materials Laboratory have carried on researches in various lines, but inasmuch as the teaching schedule of the staff is heavy, it has not been possible for them to give any large amount of time to this work.

At the suggestion of the president, Dr. H. Hencky has been added to the staff, and is devoting a large portion of his time to research on the deformation of chain links. He is planning also to offer a course of lectures to graduate students on Plasticity in metals.

In the early fall the Testing Materials Laboratory was made available to the American Welding Society which held its annual meeting at the Institute. Three companies, manufacturers of electric welding equipment, installed welding outfits in the laboratory and competitive tests on the strength of joints welded on the different equipment were made. The welds made by the different concerns were on material cut from the same bar of steel. It was interesting to note that the variation in the strength of the welds was considerable.

The Refrigeration Laboratory has received a number of gifts of refrigerating machines designed for household use. Space has been allotted to the Department for the develop-

ment of a laboratory where problems in air-heating, air-conditioning, and dehumidification can be studied. No special appropriation has been asked for equipment for this laboratory as a great deal of the apparatus has been donated. A heating boiler with oil burner has already been erected; a Carrier Unit Air-Conditioner has been donated by the Carrier Engineering Company; and one of the latest types of heating boiler has been offered by the manufacturers. A Unit Heater has been presented and a number of other pieces of apparatus have been offered to the institute at cost. Two Piatt Water Heating, Oil-Burning Service Boilers have also been presented for use in this laboratory. The Western Electric Company has donated a complete motor-driven Liquid Air Machine having a capacity of about a liter of liquid air per hour. As this laboratory is adjacent to the Refrigeration Laboratory it will be possible to utilize the cooling equipment of the latter for such apparatus as may require it.

A Torsion Dynamometer presented by the Cummings Machine Works in Boston has been installed on the shafting of the one hundred and seventy-five horse power water wheel, the power of which is absorbed by an Alden friction brake. This makes possible accurate measurement of power of the water wheel by two methods.

It has been the custom of the United States Navy to detail to Technology each year two officers for special work on the power plant of the torpedo. Two of these, detailed for an extra year, were awarded the degree of Doctor of Science.

The Ordnance Department of the United States Army has planned to make use of the facilities of Technology and of the reserve officers on its staff in training reserve officers in Ordnance for a period of two weeks active duty during the summer. It is felt that Ordnance officers need additional technical training rather than such experience as would be obtained in a military camp. This involves no expense to the Institute except allowing the use of the lecture rooms and laboratories. All of the teachers called to active duty by the Government will be paid by the Government in accordance with their military rating.

As was pointed out in last year's report the Machine Tool Laboratory has much equipment which is obsolete. The lathes

in particular should be replaced with modern tools. During the past year machines and instruments valued at about four thousand dollars, have been given to this shop.

In the lectures on Production Methods leading engineers have kindly given their services. During the past year the following have addressed the students:

Mr. R. W. Cook of the Wallace Barnes Company, Bristol, Conn. The Manufacture of Springs (1 lecture).

Mr. G. A. Pennock of the Western Electric Company, Chicago, Ill. General Production (1 lecture).

Mr. C. L. Muzzey of the General Electric Company, Lynn, Mass. General Production (1 lecture).

Mr. J. H. Skelton of Brown & Sharpe Manufacturing Company, Providence, R. I. Automatic Machinery (2 lectures)

Mr. H. L. Van Keuren of the Van Keuren Company, Watertown, Mass. Measuring with Light Waves (2 lectures).

Mr. R. L. Browne of the Metal & Thermit Corporation, Boston, Mass. Thermit Welding (3 lectures).

Mr. Fred Davis, of the General Electric Company, Lynn, Mass. Electric Arc Welding (3 lectures).

Mr. George Jaeger of the Air Reduction Sales Corporation, Boston, Mass. Oxy-Acetylene Welding & Cutting (3 lectures).

Mr. William T. Ober of the Thomson Electric Welding Company, Lynn, Mass. Electric Butt & Spot Welding (3 lectures).

Professor Smith, who has always made it a point to keep students informed as to the latest developments in the machine tool industry, is now preparing a text on Cemented Tungsten Carbide known to the trade under the names of Carboloy, Widia, Strauss metal Firthite, etc. He is also preparing material on centerless grinding and on cylinder honing, a new process in the grinding of automotive and other cylinders. Similar articles on electric arc, butt, spot, oxy-acetylene, and thermit welding are to be ready for the fall term.

Professors Miller and Holt have revised and enlarged by about one hundred pages the 1914 edition of "Notes on Power Plant Design" printed as Institute notes.

For the past eighteen months Professor Haven has given nearly all of his time to the textile industry; aiding mill executives in solving many technical problems and in training two groups of men sent to Technology from the various mills. These groups were given instruction extending over a period of six weeks per group.

Professor Haven has been appointed a trustee of the United States Institute for Textile Research.

Trustees of the Merritt Bill Fund have recently awarded the Institute forty thousand dollars for textile research.

A resilience tester for textile materials has been designed, built and put in service. A Baer apparatus for precision stapling of cotton fibre and a stereoscopic binocular microscope of the most recent design have been added. A dark room specially arranged and completely equipped for handling photomicrographs and enlargements has been built into the laboratory.

Professor Schwarz devotes considerable time to research and to the development of laboratory technique. He has underway at the present time studies to determine practical and rapid methods for measuring changes in moisture regain progressively as they occur and to adapt this principle for the automatic correction of data both for mill use in the process of manufacture and for determination of yarn counts, etc. A study has been made of the normal regain (that at standard conditions) to be expected in the various commercial brands of rayon. This is fundamental information greatly needed by the industry.

Through the efforts of Professor Schwarz a textile microscope, fully equipped for a very wide range of usefulness in the textile field, has been proposed, designed, and finally made available at very low cost through one of our leading optical companies.

Work is now actively in progress in coöperation with both of the large optical companies leading to the establishment of a full line of optical equipment and to the design and construction of a number of special accessory devices. Among these may be mentioned a new goniometer eye-piece, a new precision scale for direct reading with the Camera Lucida, a special mount for fabric both for longitudinal and cross section investigation and for stereoscopic photomicrography. The application of direct color photography to textile microscopy is producing results of considerable interest and value. A short motion-picture has been prepared in the laboratory to illustrate the newer technique in textile microscopy. This is available to schools and to the industries on request.

Work is continuing on the analysis of fibre structure and

in the active work of micro analysis of fabrics and yarns. In this latter field many problems of practical value submitted by the industries have been satisfactorily dealt with.

Mining and Metallurgy. A substantial increase is noted in the number of students registered in the Department, a large percentage of the increase being credited to the option in Metallurgy. Growth is apparent in both the graduate and undergraduate divisions.

The problem of acquainting the public with the importance of physical metallurgy and the broad field of its applications in industry has been the subject of much study and discussion among the members of the Department. A lecture entitled "The Romance of Metals" was delivered by Professor Williams in the Society of Arts lecture series. The lecture dealt with the problems and achievements of physical metallurgy, and attracted much public interest and brought many inquiries from young men seeking to make a choice of profession. The field of physical metallurgy was illustrated by experiments and by an unique display of aluminum parts provided by the generosity of the Aluminum Company of America. Some of the articles displayed were aluminum chairs, airplane wing members, a propeller and a number of aluminum castings of unusually complicated character. A splendid collection of pieces of the new iron-chromium-nickel alloy, "Enduro," in its various fabricated forms was loaned for display by the Ludlum Steel Company. Included were kitchen and table utensils, and sections of embossed interior wall panels representing novel and attractive architectural applications of metallurgy.

John T. Norton has joined the staff of the Department as Associate Professor of Physics of Metals. He is specializing in the field of X-ray work applied to studies of metals equally in the fields of research and instruction. The transfer of this work from the Department of Physics brought to the Department a complete radiographic laboratory and considerable apparatus for the study of problems of metallography by the diffraction method.

William H. Graves, Jr., appointed an assistant in Mining Engineering, is a graduate of this Department and returns for graduate study in the field of geophysics and its applications to

prospecting and mineral exploration. He has been employed by the Swedish-American Prospecting Corporation operating under the Lundberg patents, and is on leave of absence while he fills his engagement here. He has had extensive experience in the United States, Canada, Newfoundland and Mexico and, in addition to his routine duties, will provide able assistance both in research and instruction in the field of geophysics.

It has been the policy in the administration of the Department to encourage graduate study and research on the part of the junior members of the staff, and all who have not already taken their Doctor's degree, are now registered for graduate work. The Department needs more space, particularly for work in physical metallurgy and geophysics, and in view of the increasing registration it will be necessary within a year to provide for a considerable increase of room. Some relief has been found this year by rearrangement of space in the basement formerly used for storage, and two rooms are being equipped with electric and gas-fired melting furnaces, nitriding furnaces and other apparatus for research in metallurgy.

New equipment has been added as follows:

Laboratories of Physical Metallurgy

(1) Gas melting furnace of Babcock and Wilcox type, capacity 60 pounds of iron, for use in the cast-iron research now in progress.

(2) Two small 100-gram capacity Babcock and Wilcox type gas furnaces which are in constant use for the preparation of alloys.

(3) Hevi Duty nitriding furnace. This is a small type commercial furnace with a cylindrical chamber 10 inches diameter and 20 inches high for use in determining the effects of nitrogen on steel in forms other than the round bars upon which the work has been done hitherto.

(4) American gas furnace heat-treating unit designed for high-speed steel.

(5) Two Brown indicators and General Electric relay controllers for regulation of furnace operating temperatures. These are in use in the graduate research laboratory.

(6) Republic automatic temperature control and panel; a small but effective unit which is used for regulating temperature in any one of our furnaces.

(7) Testing machine for determining the transverse strength of cast-iron. This machine is designed for the standard arbitration bar, but is nevertheless adjustable to take a bar of any length.

(8) Firth hardometer; an instrument designed for measuring the hardness of metals which are so hard that they exceed the capacity of the other type machines.

Laboratory of Geophysics

(1) Askania Werke vertical field balance used in the field of magnetic prospecting where the measurement of very weak fields is necessary. This balance has already been applied successfully in undergraduate research for the tracing of a contact of granodiorite and conglomerate where the rock formations were hidden under a mantle of many feet of glacial gravel.

(2) Complete set of apparatus used by the Swedish-American Prospecting Corporation in the electromagnetic method of prospecting for ore bodies.

(3) Equipment suitable for demonstrations on a laboratory scale of the principles of electrical and magnetic prospecting.

The character of research activities carried on by members of the staff is illustrated by the following notes:

Professor Norton has been engaged in studies of the applications of the X-ray to the inspection of welding, these being carried on in coöperation with the Fundamental Research Committee of the American Bureau of Welding.

Professor Homerberg is investigating the effects of depth of nitrided case resulting from the addition of various elements to the steel as chromium, nickel, aluminum, molybdenum and vanadium. Another research, in coöperation with a candidate for the degree of Doctor of Science, deals with the effects of various alloying elements in iron with reference to the possibility of malleabilizing, to be followed by nitrogen case-hardening.

The type of research being done by students is illustrated by a few selected titles as follows: (1) "Electrical Prospecting: Equipment, Field Procedures and Interpretation"; (2) "Economic Aspects of Tin Mining in Mexico"; (3) "Lead Coating of Sheet Steel"; (4) "The Effect of Hydrogen on the Porosity of Cast Copper"; (5) "The Effect of Pressure on the Nitriding Operation"; (6) "The Wear Resistance of Certain Ferrous and Non-Ferrous Alloys."

Members of the staff are engaged in outside activities associated with technical societies and research organizations of which mention is made as follows:

Professor Waterhouse continues his work with the Iron Alloys Committee of Engineering Foundation; he has accepted appointment as a member of a small committee representing the American Society for Steel Treating and Engineering Foundation on international collaboration in metallurgical research;

he continues his membership on the Executive Committee of the Iron and Steel Division of the American Institute of Mining and Metallurgical Engineers; he is a member of the Advisory Committee of the Metallurgical Division of the National Bureau of Standards; he is Chairman of the Boston Chapter of the American Society for Steel Treating; and he has recently become a member of the Advisory Board to the Research Department of the Westinghouse Electric and Manufacturing Company.

Professor Homerberg is Chairman of the Publications Committee of the American Society for Steel Treating and is Chairman of the Nitriding Committee of the same society. There continues to be a call for his lectures on the subject of nitriding and he has appeared during the past year before the chapters of the American Society for Steel Treating at Detroit, Syracuse, and Hamilton, Ontario.

Following the meetings of the Engineering Congress in Japan Professor Locke visited mines and metallurgical plants in that country, and upon his return spent several weeks in visits to mines and ore dressing operations in the southwestern United States.

Professor Mann made an extended visit to oil fields in Kansas, Oklahoma, northern Indiana, Ohio, northern New York and southern Ontario during the summer and Professor Hutchinson visited mines in Arizona and Baja California, Mexico.

The usual sessions of the Summer Mining Camp, including instruction in surveying and mining practice, were held in Dover, N. J.

The summer school of metallurgy, comprising a group of six students, under the direction of Professor C. R. Hayward, visited metallurgical plants in New Jersey and eastern Pennsylvania. We are deeply indebted to the following companies for generously receiving our party in their plants. Bethlehem Steel Company: steel plant at Bethlehem, Pa., iron mine at Cornwall, Pa., iron ore concentrator at Lebanon, Pa. New Jersey Zinc Company: zinc smelter and oxide plant at Palmerton, Pa. United States Metals Refining Company: copper smelting and refining plant at Chrome, N. J. American Smelt-

ing and Refining Company: lead refining plant at Perth Amboy, N. J.

Mr. Foster spent five weeks during the summer in the vicinity of Bowling Green, Ky. as a member of a field staff of the United States Bureau of Mines, carrying on earth resistivity measurements as an aid in the discovery of shallow petroleum deposits at depths varying from 100 to 500 feet.

Aeronautical Engineering. The arrangement for the limitation in the number of students admitted to this course has been continued and appears to be working satisfactorily. The administration of this system proved to be a problem of considerable magnitude, but much progress has been made and it is believed that the system as finally worked out is reasonably satisfactory and as fair as possible to all concerned.

In addition to the regular classroom work several series of lectures were given by men prominent in the field of aeronautics, notable among which were Dr. Ludwig Prandtl of Göttingen, E. P. Warner, non-resident professor, and Dr. S. A. Moss, special lecturer.

The course has been very fortunate in securing the services of Associate Professors Richard H. Smith, O. C. Koppen, and J. S. Newell. These additions to the staff were made to offset the heavy losses due to resignations at the end of 1928–1929 and have made it possible to strengthen the professional courses considerably.

In connection with instruction, two new pieces of equipment deserve special mention. The completion of the five-foot wind tunnel made possible a more varied and better balanced course in Aeronautical Laboratory, particularly for graduate students. A new six component automatic balance was designed and installed in this tunnel and has proven very satisfactory, both for instructional and research work. Another piece of apparatus which has proved highly valuable for instruction is a special high-speed engine indicator, which is used for classroom demonstrations in the courses on aircraft power plants.

In the field of aerodynamics one of the most important investigations made was a study of rigid airship stability conducted upon curved models of airship hulls. This work proved to be a distinct contribution to existing knowledge with regard

to the aerodynamics of airships. Other important investigations completed include a determination of the forces on the leading-edge airfoils of slotted wings, tests for improving the general design of a high-wing monoplane, an investigation of cowling for airplane radiators and the investigation of a system of measuring turbulence. Aside from these investigations, the usual number of routine tests and tests of models and devices for the trade have been made.

In the field of airplane power plants, the more important investigations completed include the determination of the bearing loads on four radial engine crankshafts, the effect of valve overlap under supercharging conditions, the control of detonation by means of the spark timing, and a rather complete investigation of carburetion of furnace oil.

Considerable progress has been made in the construction of apparatus for the testing of models in still air by means of a carriage on inclined wires. This method is being used pending completion of the new towing basin which will provide an almost ideal equipment for aerodynamic investigations of this character. Other important investigations in progress concern the flow of air through the propeller disc and the down wash and tail plane efficiency of airplane models.

In the field of aeronautical power plants much progress has been made in the development of a very sensitive, high-speed indicator using the variation of electrical resistances with pressure as a basis. Progress has also been made on the development of an indicator similar in principle to the Farnboro indicator but with some improvements. An air-cooled cylinder for experimental work on the high-speed Diesel cycle has been completed and further progress has been made on the study of air flow around straight cooling fins under the auspices of the National Advisory Committee for Aeronautics.

In the field of airplane structures investigations under way cover studies of aluminum alloy sheets under shear and compression. The results so far obtained indicate the desirability of continuing these studies in order to obtain data which may be used for design purposes and for theoretical research into the elastic properties of aircraft materials.

On account of the difficulties in presenting specialized professional courses in other than pure lecture form, it is felt that

an effort should be made to encourage the adoption, at least experimentally, of certain more progressive educational methods. As a step in this direction it is planned to install an "honors group system" during the coming academic year. This, together with the proposed reduction in the sizes of the classes, should be of material assistance in improving our pedagogical methods, but it is felt that extra departmental discussions of classroom methods would be of great benefit.

The proposed towing basin for the Department of Naval Architecture gives promise of being an extremely valuable piece of equipment for aeronautical research, and it is felt that very close coöperation between the two departments should be continued throughout the period of design and construction of the basin.

Meteorology. During the year graduate studies in one or more meteorological subjects were pursued by five Government students and two civilian students. Four of the Government students were awarded the degree of S.M. The two civilian students are continuing their work for the degree of Sc.D.

It is to be hoped that the number of civilian students will increase. Partly to assist in the firm establishment of the Meteorological Course, the Navy Department is planning to send two students here for the year 1931–1932.

It is obvious that a basic training in physics is essential to meteorologists, and many meteorological phenomena can be explained by a skillful application of physical laws. It is too much, however, to ask a young college graduate in physics, completely lacking training in theoretical meteorology, to make these applications.

The immense amount of research in theoretical meteorology during the last decades and the quantitative application of physical laws helps us mainly in the explanation of isolated meteorological phenomena, but is of little use in forecasting.

Modern forecasting is based on the study of air masses, their characteristics and their interaction at common boundary surfaces. The methods recently developed by Norwegian and German meteorologists for the attack of this problem are peculiar to meteorology and have no direct counterpart in other sciences. In spite of inadequate observation material the Insti-

tute is the only institution in the United States where work of this type is carried on successfully.

On account of the limited number of students, the smallness of our instructing staff, and in order to keep the instruction on a uniformly high plane, it is unwise to offer at the Institute courses in other than purely meteorological subjects. Candidates for the Doctor's degree in meteorology should have a somewhat broader knowledge of geophysics and especially of those of its branches which are closely related to meteorology. Meteorology and oceanography have a number of boundary problems in common and the methods employed in studying the dynamics of air currents may, with slight modifications, be adapted to the study of ocean currents. Hence it is hoped to secure for our students this broader training through coöperation from other geophysical institutions.

During the spring of 1930 arrangements were made with the Oceanographical Institute at Harvard, the Smithsonian Institution, the Department of Terrestrial Magnetism of the Carnegie Institution of Washington and the United States Weather Bureau, to secure their coöperation in the training of our candidates for the degree of Doctor of Science.

It was stated in the report for 1928–1929, that the principal object of our research work would be the rational development of synoptic meteorology — and thus the creation of a basis for improved weather forecasting. We have adhered to this plan during the past year.

Based on our studies of the twice-daily synoptic charts prepared at the Institute since February, 1929, we have studied and classified American air masses according to a system which has now been in use for more than one year. We have found that it is possible to discern, on the weather maps for the North American Continent, at least four distinctly different air masses, which acquire their essential characteristics over four widely different regions of the northern hemisphere.

By a comparison of free air soundings of temperature and humidity with the surface maps, we have investigated the vertical distribution of specific humidity and entropy within these air masses. A method has been developed of identifying the air currents through a combination of the two elements just mentioned, and it has been found that the air masses (surface

layers excepted) retain their characteristics to an amazingly high degree. A report on this investigation has been prepared and will be published shortly.

In this connection it should be stated that the United States Weather Bureau now is discontinuing the operations of its five kite stations, on account of the hazard they offer to aviation. These stations have furnished the material for the above mentioned investigation, which so clearly indicates the value to weather analysis and forecasting of daily temperature and humidity readings from the free atmosphere. An earlier investigation carried out at the Institute indicated the value of such soundings in the forecasting of local heat thunderstorms.

In view of the fact that so many naval officers are detailed for duty on the West Coast it has been thought advisable to devote special attention to the meteorology of California. This work, which is still in progress, should be of decided value to aeronautical meteorologists.

Dr. Willett completed during the spring the synoptic fog studies with which he has been occupied since 1927.

Mr. Pekeris, a candidate for the Doctor's degree, is now working on a critical survey of the various theories in connection with radiation equilibrium in the atmosphere, preparatory to an attempt to attack this problem, taking into consideration the selective character of the absorption of both solar and terrestrial radiation in the atmosphere.

The activities of the two assistants employed at the Round Hill Meteorological Station have been to gather as complete data as possible for determination of the physical characteristics of the natural fogs along the New England coast.

Several hundred determinations of the size of fog droplets were made by means of corona measurements. These observations should be continued and improved by the use of light of a well defined wave length. A survey of the data shows one result that should encourage continued studies. The transient fogs of frontal type, which prevailed during the winter, seem to have larger droplets of variable size, whereas a stable June monsoon fog period of more than a week's duration was characterized by small, almost constant droplets.

Some efforts have been made to develop a method to measure separately the vapor and liquid water present in fog,

without the aid of the hair hygrometer. A few preliminary experiments were promising but definite results are lacking.

The routine observations and the daily weather map work at the station was greatly appreciated by pilots of aircraft operating from or visiting Round Hill.

Electrical Engineering. Five years' experience with the honors-group plan has convinced the Department that it is an educational tool of real value, developing in those students capable of undertaking its responsibilities the exceedingly valuable characteristics of resourcefulness and enthusiasm in scientific matters. A detailed report of experience under the plan was made in May to the President and Faculty. By vote of the Faculty the Department is now authorized to continue the plan as a permanent part of its educational program. Certain changes in administration were introduced during the year, and, by authorization of the Faculty, a comprehensive examination, conducted in coöperation with examiners invited from industry, was required of honors students before graduation. It appears that other departments will wish to adopt honors-group plans along similar lines, and the experience in this Department may be of value to them in such undertakings.

The senior colloquia, led by men from the industries who are recognized leaders in various branches of electrical engineering, have continued to prove a source of inspiration, especially to our honors students and staff. The Department is under obligation in this connection to the American Telephone and Telegraph Company, the Westinghouse Electric and Manufacturing Company, the General Electric Company, the Weston Electrical Instrument Company, and the firm of Jackson and Moreland.

Lectures, especially for freshmen and sophomores registered in electrical engineering, have again proved valuable in clarifying in the minds of students the aspects of the various branches of electrical engineering. For the lectures of the past year we are indebted to Mr. N. J. Darling, Works Manager of the River Works of the General Electric Company at Lynn; Mr. J. H. Bigelow of the Personnel Department of the New York Telephone and Telegraph Company; and Mr. E. S. Mansfield of the Edison Electric Illuminating Company of Boston.

In connection with its first course in Principles of Electrical Engineering the Department also arranges a course of orientation lectures for sophomores, given by staff members and by invited guests.

The importance of graduate study in the Department continues to increase. In June, 1930, fifty-three graduate degrees were conferred in the Department, of which six were Doctor's degrees. This large amount of graduate work has resulted during the year in a number of researches of interest, particularly in the fields of circuit theory, machine transients, dielectrics, illumination, and acoustics in communications. Coöperation with other departments of the Institute, and in particular with the Departments of Mathematics and Physics, has been most pleasant and valuable in connection with this graduate work.

The Department now has by far the largest graduate school of electrical engineering in the country. It strives to maintain its standard of graduate work also preëminent. That this is in a measure being accomplished is indicated by the increasing amount of recognition being given to our graduate work by various foreign institutions.

In order that it may maintain first rank in advanced study it is necessary to continually improve and extend our staff, processes of instruction, and facilities. Important recent additions have been made.

Acoustics is now such an important branch of electrical communications engineering that it has required special attention. The Department now has a laboratory of acoustics in communications, an assistant professor who is carrying on important research along these lines, and is paying especial attention to precision of measurements in this field.

The illumination laboratory has been extended, and certain modern apparatus introduced. There is much interest at present in sources and methods of application of illumination for special purposes.

The program of development of analyzing machines goes forward rapidly. The original integraph has now been employed on something over thirty researches, not only in those problems of electrical engineering for which it was especially constructed, but also in problems originating in other departments, or outside the Institute entirely. It is being made available without

charge to any research worker having a serious problem to the solution of which it may be adapted. The new model, much more flexible and precise, has now passed that point in development where it can be said that all major difficulties in design and construction have been overcome, and it will soon be in operation. Its field of usefulness should be large. There has also been completed during the year a model of a photoelectric analyzing machine which promises to be useful in analysis in all problems involving integrals with variable parameters; for example, in the evaluation of correlation factors and in periodogram analyses.

The Network Analyzer, a device on which an electrical duplicate in miniature of important power systems may be readily set up, was completed during the year. This is a joint project of the Department and the General Electric Company. It was placed in use in December, as the first device of the sort. It is, in brief, an alternating-current calculating table for the solution of problems of research and practice concerning the distribution of power by large complicated networks, the solution of which by ordinary methods is impracticable. It is much more accurate and adaptable than the resistance calculating tables which preceded it. Several publications and bulletins on this device have been issued, and it is now in important use on practical problems of power companies and on our own research.

The research on thermal conductance of power cables, conducted by the Department in coöperation with the National Electric Light Association, has now been completed. It has been followed by a study of the precision measurement of power factor at low frequencies and on small samples, which is now under way.

During the year progress has continued in research on transients in electrical machinery. The equipment of the research laboratory on machine transients is being gradually increased, in order that the important theoretical studies which are being made may be accompanied by those experimental verifications which are necessary for sound progress in any field of physical research, and especially in the complicated field of machine transients.

During recent years there have been several graduate theses on the general subject of gaseous-conduction apparatus,

and the subject has received considerable attention in the Department. It is becoming increasingly apparent that apparatus of this type is destined to play an important role in electrical engineering, and that the Department must soon be in a position to carry on research and instruction on the engineering aspects of this important matter to a much greater extent than at present. The Department has realized for some time the importance of this undertaking and now thoroughly realizes its urgency.

The research at Round Hill continues. There has been an interesting theoretical and experimental study of the penetration of fog and rain by radiant energy of various wave lengths; and an experimental examination of the theory of radiation from an antenna, the latter much aided by a dirigible loaned for the purpose by the Goodyear-Zeppelin Corporation. There has also been progress on meteorological problems under the technical direction of the meteorological staff of the Institute but administered by this Department. The Vail Library continues to be a very important part of our research equipment.

The number of monographs and articles by members of the electrical engineering staff and graduate students of this Department is steadily increasing, there having been thirty-four contributions published during the past year.

During the past summer the Department has been fortunate in having on its summer school staff Professor C. O. Ruggles of the Harvard School of Business Administration, and Professor W. W. Stifler, of Amherst College. It is pleasant to have distinguished men from other institutions with us, and profitable to both students and staff.

The need of the Department for adequate space in which to expand its activities mentioned in many department reports and in the President's report of last year, is now acute. During the past fifteen years the Department has grown considerably. It has developed a large graduate school. It has carried on considerable research. It has introduced new processes of education in engineering such as the honors-group plan. It is still in substantially the same original space. There is need for additional room for graduate research, a reading room, and especially office space. Lack of sufficient office space in which to place men doing important research or administrative work is un-

doubtedly at present seriously limiting the efficiency of the Department.

The increase in scholarship aid to students, which may be granted on the basis of marked ability, which should follow the establishment of the loan fund, will be of real aid to the Department in its continual effort to raise its standards.

Naval Architecture and Marine Engineering. The effect of the Jones-White Act has been to stimulate shipbuilding in United States, and that is probably the reason for the increase in the number of students.

Considerable work has been done on the plans of the proposed Experimental Tank, both as regards the buildings and apparatus. Mr. Beidelman, a graduate of Course XIII, was added to the staff for the purpose of undertaking the drawings and investigations, with the result that we are in a position to proceed with the work as soon as funds are available. The main buildings have been designed in coöperation with the River Tank work and that on hydraulic turbines, so that the whole combination as planned would form a complete hydrodynamic laboratory.

Mr. Magoun's appointment as associate professor of Humanics left a vacancy which has been filled by appointing Mr. Beidelman assistant professor of Naval Architecture.

The Nautical Museum has been enriched by two new models. The larger one, the *Christianus Quintus*, having been purchased in Denmark where it was constructed from the original drawings, and is therefore an historically accurate representation of a battleship of the year 1700. The smaller model is that of Henry Hudson's Dutch boat *Half Moon*, in which he explored the Hudson River. This model is now in the same case with the *Santa Maria* and *Mayflower* models which form an interesting group of ships associated with the history of America.

The museum possesses a considerable number of Currier & Ives prints, and Mr. Fred J. Peters who was engaged in writing a work on these prints found several in the museum which he could not obtain elsewhere, and at least one of the prints belongs to an issue of which only three copies exist.

Architecture. The year 1929–30 brought evidence of confidence in the Department from different sources. The most conspicuous expression of this confidence came in the form of aid for deserving students. In the middle of the winter an anonymous gift of one hundred thousand dollars was received, the income of which was to be used in aiding students of particular promise to enjoy the opportunities that the Department offers. The family of Henry L. Newhouse have established a travelling scholarship of one thousand dollars in his name, that will enable one of our graduates to spend six months abroad annually. Further evidence of this confidence came from Mrs. H. A. Lamb, who gave five hundred dollars to enable a student to travel and study architecture in this country during the three summer months. This is a new departure in scholarships, and we are hopeful that the holder will make so convincing a demonstration of its usefulness, that it may become a permanency. Other friends have, as in previous years, enabled the Department to send two students to study at Fontainebleau during the summer.

In justification of such confidence graduates of the Department won the Rotch, the Guy Lowell, the Kelley, and the Paris prizes, the latter, which is the blue ribbon of prizes among architectural students, was won for the third time in four years. All of which is good evidence of the effective teaching of our design staff under the leadership of Professor Carlu.

Thirty-nine Bachelors' degrees were granted during the year, being the largest number in the history of the Department and marking the last class to graduate on the four-year basis.

We record with deep regret the death of Professor A. S. Jenney, whose fifteen years of service have been of great value, and whose example and influence were much appreciated by staff and students alike.

The withdrawal of the privileges of the honor system, which the Department had enjoyed for the past ten years, but which no longer received the whole hearted coöperation of the student body, is recorded with regret.

Recognition is due to the staff and to the clerical force as well as to the Visiting and Advisory Committees for their unfailing coöperation. To the latter is due the recommendation, which we hope to see in successful operation this coming year,

that teachers of important first and second year subjects, hitherto given in Cambridge, will be enabled to hold their classes in the Rogers Building.

Architectural Engineering. The new course in the study of materials of engineering offered to our students under the direction of Professor H. W. Hayward, which was introduced last year, has proved very successful and has justified the increased time necessary for its introduction.

In connection with the course in Concrete Laboratory the class has this year, under the direction of Professor R. G. Adams, for the first time made a number of field trips. These included visits to the Simbroco Stone Company, a central concrete mixing plant of the Boston Transit Mixers, Inc.; a central mixing plant of the Boston Sand and Gravel Company; a cinder block plant of the Cinder Concrete Company; and the Massachusetts Cement Block Company.

In connection with the course in Structural Drawing the students were taken to the plant of the New England Structural Company, for a study of the drafting room methods, and of the templet and fabrication shops.

In line with the hope expressed in the report of last year, it was found possible to introduce as a part of the course inn Structural Design, a number of lectures on arc welding given by T. H. Whitney, President of the Whidden, Beekman Engineering Company of Boston. In connection with these lectures we are indebted to the General Electric Company for literature and specimens. The lectures served merely as an introduction to the subject, and it is hoped that means can be found to provide for similar lectures in the future, which will keep pace with the new developments along these lines which are bound to have avery important influence on construction methods.

Drawing. In line with the effort which has recently been made to bring the courses in Drawing and Descriptive Geometry into closer relation to one another, and in accordance with the recommendation of the committee having charge of the study of the freshman courses, the two subjects hitherto offered by the Division of Drawing will be combined under the one title "Drawing and Descriptive Geometry." The new course which

has been developed during the last two years, met with the approval of the committee and will hereafter be taken by all the first year students except those of Course IV.

The new course will include the basic principles of the old classical method of Descriptive Geometry, but will emphasize the newer method which makes extensive use of auxiliary planes of projection. The newer method can be reduced to a few simple fundamental principles which form the basis for the solution of the infinite variety of special cases, and which in almost all instances produce results with great simplicity and directness.

The reaction of the students to the new methods will be carefully watched. Studies already made seem to indicate clearly that the new method arouses and holds the interest of the students much more successfully than the old.

A new and concise text covering the descriptive geometry has been prepared by Professor H. W. Bradley and one covering the work in engineering drawing has been prepared by Professor A. L. Goodrich.

Mr. E. F. Watts has been promoted to an assistant professorship in Drawing and Descriptive Geometry in recognition of his great interest and creditable work in connection with the development of the new course.

This year, for the first time, the Society for the Promotion of Engineering Education held a summer session in Engineering Drawing and Descriptive Geometry at the Carnegie Institute of Technology in Pittsburgh, Pa. This session was attended by three members of our staff who were thus able to make interesting personal contacts with most of the representative teachers of this subject in this country.

Economics and Engineering Administration. During the past year there has been a steady advance in more specialized work of the staff engaged in instruction in business management and allied subjects. Coincident with the completion of Professor Raymond's research in the field of economic production analysis, which is shortly to appear in book form, a new research project has been undertaken with regard to the measurement of management, in order to provide material for instruction in a new graduate course. As a continuation of the

previous research, specific economic production quantity problems in various types of industry have been investigated. During the past summer he has carried his study of measurement in management into new, and, in some cases, untouched fields.

During the second term a group of twenty-five senior students engaged in theses research under the supervision of the Department with the collaboration of the New England Council. A variety of problems were undertaken and summaries of the findings were presented by the students to the Council delegates assembled at the ninteenth quarterly meeting, held at Poland Springs, Maine, in June.

Manufacturing Analysis, a graduate subject, was offered for the first time by Professor Schell. During the spring he addressed a conference conducted by the American Academy of Political and Social Science, which was devoted to consideration of the "Second Industrial Revolution and its Significance."

Professor Elder, who joined the staff in 1929, has been carrying on a research in a number of progressive establishments concerning policies and methods of industrial marketing, in preparation for a graduate course to be given during the coming year. He also spent a considerable period in Washington, in a study of the results obtained from the recent marketing census.

The placing of junior students in supervised summer employment has been given further emphasis. Despite the depression during the summer the usual number of students were placed and the periods of employment were increased. In each case arrangements were made so that the undergraduates had contact with higher officials, and prepared reports for them on certain phases of their business, in addition to the routine activities under the supervision of foremen. Weekly reports were also inaugurated, which were sent to Professor Fernstrom, who has acted as supervisor of the summer work. Professor Fernstrom has likewise been carrying on field research in the preparation of a graduate course in industrial traffic management.

Special effort has been made to develop the instruction in the accounting courses, in order to give more emphasis to the interpretative side rather than the mechanical. Notes amounting to one hundred pages of mimeographed material have been prepared. In cost accounting the aim is to give greater atten-

tion to the aspect of control, not only in the field of manufacturing costs, but also in sales and administrative activities. Two new graduate courses were laid out to replace courses already in the catalogue. The first of these covered the important fields of analysis and interpretation of business statements, and the second the problem of obtaining adequate control of a business enterprise through the device of accounting records.

Comprehensive data concerning the Pre-Technology, Technology, and Post-Technology records of 875 graduates of the course have been collected and organized for classification and summary by use of mechanical tabulating equipment. It is hoped that the resulting information will be of service in determining questions of policy in the further development of the course.

In the elementary course in economics an effort has been made to arouse greater interest by introducing material dealing with current economic questions. An effort is being made to show how the field of economics and engineering are interrelated. Illustrations drawn from industrial and technical fields are sought for. It is hoped to experiment further in this direction during the coming year.

Professor Doten was granted a leave of absence for the first half of the academic year 1930–1931. During the past year he has continued his research work with the National Retail Dry Goods Tariff Committee.

In May the Executive Committee separated the course of Engineering Administration from the administrative responsibility of the Department of Economics, thus creating a new Department. It is expected, however, that the two departments will work in close coöperation for a common end.

Biology and Public Health. The year has been one of consistent growth, with increased registration in both graduate and undergraduate divisions.

The undergraduate curriculum has undergone little alteration during the year, the principal changes being a revision of the course in Theoretical Biology, rearrangement of the courses in Elements of Physical Chemistry and Chemistry of Water and Sewage to coördinate more advantageously with advanced work in Bacteriology and Biochemistry and extension of the work in

Food Technology. In the public health group several of the graduate courses have been reorganized and extended, notably those in Epidemiology, Public Health Surveys, and Pathology. The courses in Advanced Bacteriology and Enzyme Chemistry are undergoing constant extension in scope as a result of the rapid developments in this growing field.

Professor Turner's work in health education has been so highly esteemed that an evening course was arranged for a large group of teachers at Lynn during the first semester.

The investigations carried out in the Department have included:

The Isolation of the Therapeutic Bands of Ultra-Violet Light.
Researches on the Biochemistry of Vitamin A.
Studies on Irradiation of Ergosterol.
The Effect of Homogenization of Disinfectant Efficiencies.
Investigation of the Chemistry of Chromogenesis in Bacteria.
An Investigation of Bacterial Detoxification.
A Bacteriological Investigation of Household Dusts.
A Biological Survey of the Mt. Desert Region.
Further Investigation of Fermentations Yielding the Butyl and Isopropyl Alcohols.
The Sanitary Disposal of Human Excreta in Rural Districts.

In addition to the investigations above mentioned, several important research projects have been undertaken or continued in coöperation with industrial organizations which have requested the Department to conduct scientific work of basic character.

Professor Prescott and Professor Bunker have supervised investigations on the theory and practice of dehydration of fruits in collaboration with the T. S. Simms Company of St. John, N. B. Professor Prescott has organized and supervised an investigation of quick freezing in relation to its effect on the organisms responsible for food poisonings in collaboration with the General Seafoods Company, and has continued the bacteriological investigations of domestic refrigeration in collaboration with the Frigidaire Corporation.

Further investigations on the Chemistry of Coffee have been conducted in collaboration with the Brazilian-American Coffee Committee.

Continuing the arrangement of the year before, Professor Turner has supervised the preparation of instructional health

motion pictures which are being produced by Eastman Teaching Films. In addition to, and in connection with this work, the Biocinema Research Laboratory of the Department has now been developed to the point where stop motion and microscopic cinematography may be used as a new research tool by the Department of Biology and by other Departments at the Institute. Professor Turner's other research activities have included a study of the Health Significance of Intermittency in the Growth of Children, and he has also participated in research studies dealing with Employees Effectiveness which are being carried on by the Western Electric Company. During the past summer he taught Health Education to a group of three hundred teachers in Honolulu, Hawaii, lecturing also at the University of California and the University of Washington.

Professor Proctor devoted the summer to a study of processes of food technology in California and at intermediate points.

Professor Horwood has completed a survey of the Health Department of Somerville, Mass., in conjunction with the studies carried out for that city by the Division of Municipal Research.

The growth of the Department, and the increase in class work and especially in research activity, keeps constantly before us the need for increased space. It is recommended that as soon as possible efforts should be made to secure the proposed Sedgwick Memorial Laboratories, wherein the work of instruction may be carried on more advantageously, and adequate research laboratories provided for the growth of the research activities which are now showing a rapid and healthy development, and which are now located in temporary quarters, some of them outside the departmental limits. It is also recommended that a division of research with increased personnel, be set up when the facilities above mentioned can be provided.

Many of the investigations previously mentioned are still in progress.

Physics. During the year there has been a rearrangement of the courses in elementary Physics providing for a material increase in the time to be devoted to this subject in the first year. This change will be put into effect at the beginning

of the next school year. This extension of time was urgently needed because of the increase in the subject matter which it is now necessary to include in elementary Physics. A considerable portion of the added time will be devoted to Mechanics. A similar revision of the work in second year Physics is underway.

A portion of the X-ray laboratory has been transferred to the Department of Mining and Metallurgy, and the X-ray researches which have to do with metallurgy will hereafter be carried on in that Department. Because of the congested condition in the Radiation Measurements Laboratory it has been found necessary to move it to a larger room in the basement, where equipment for instruction and research has been considerably increased.

The small laboratory assigned for graduate work in physical ceramics last year is already overcrowded. Several investigations have been started by advanced students in this laboratory including a critical survey of New England clays.

In spite of many attempts to economize room the Department finds itself greatly overcrowded, and it is hoped that construction of the new physics building will begin soon. A number of lectures have been given during the year, mainly on theoretical subjects, by visiting physicists.

There has been a further increase in the number of students taking the Physics Course, the total number of undergraduate students specializing in Physics now being fifty-three, and the number of graduate students, sixteen.

The researches in theoretical and experimental Physics have been carried on in increasing numbers. Some of the problems now underway include:

An investigation into methods of tempering the scale in musical instruments of the siren type.

Measurements of color by the spectrophotometric method.

Spectroscopic and electrical studies of excitation of vapors and gases.

Studies of photochemical changes in glasses.

Sound insulating building partitions.

Sound deadening properties of floor coverings.

Investigation of the Raman effect.

Anomalous dispersion of dipolar liquids.

X-ray structure determination of pyroxene amphibole and melitite groups.

The photoelastic study of stresses in rotating disks and of aero engine crank shafts.

The study of the temperature changes in underground cables.

The study of the creep of steel at high temperatures has been continued, and because of the importance which was attached to the results already obtained, a large increase in the equipment for that work and considerable expansion of its program has resulted. A study of the mechanical Barkhausen effect as a means of determining the nature of the flow of metals under load has been begun.

Professor C. L. Norton, who has served as head of the Department since 1922, has resigned to devote his time to the administration of the Division of Industrial Coöperation and Research. Professor John C. Slater has been appointed Professor of Physics, in charge of the Department.

Chemistry. Attention is again directed to the adverse conditions under which the Inorganic Chemistry Division is attempting to provide adequate instruction to the freshman class. It is imperative that either the number of students admitted to the freshman class be restricted or that new laboratories be provided with appropriate space. The first term of the 1929–1930 academic year 649 students had to be accommodated in laboratories possessing a total of 560 laboratory desks. The number of students for the year 1930–1931 will not be far from 700. Changes in the teaching procedure in the freshman course are urgently needed but impossible to put into effect under existing conditions. Another feature of the overcrowding is the lack of office and laboratory space for instructors, producing a condition where relief for the overburdened teaching staff is difficult or impossible. These conditions will be greatly improved by the provision of the new chemical laboratory which will free space now used for graduate work.

The general subject of Analytical Chemistry has been used to an increasing extent during the past few years as a means of fixing fundamental principles rather than merely as a drill in analytical methods. Good progress has been made and the work proves more interesting to both the students and the staff. An increasing amount of coöperative activity is noticeable between

the staff of the Analytical Division and that of the Research Laboratory of Inorganic Chemistry.

The number of students receiving instruction in Organic Chemistry has not been materially greater than during the preceding year. The last report called attention to the overcrowded condition of the Organic Laboratories pursuant to the taking back of space for the new quarters for Metallurgy temporarily occupied by Chemistry. Further space for the latter subject is to be obtained by abolishing one of the Organic Laboratories. It is urgently recommended that this step be delayed until equivalent space and facilities are available for the organic work. The lack of suitable laboratory space available for this work will be remedied when the new Research Laboratory for Physics and Chemistry is occupied.

The course in Physical or Theoretical Chemistry is one of the most important courses in the upper two years. The relatively large number of poor records in this course during recent years undoubtedly indicates that the process of selecting students for continuation at the end of the freshman and sophomore years is defective. That the work of the first year should be strengthened is beyond doubt, but practically impossible as long as the entering class is allowed to increase year after year. The problem of the quality of the students in the upper years is one of fundamental importance if a high educational standard is to be maintained.

The number of students applying for graduate study in the Department has steadily increased during the past five years. The point has been reached where the acceptance of additional students is not warranted in view of present limitations of staff and facilities. No definite space reservations for graduate study and research were made, excepting for Physical Chemistry, when the present building was designed, and the completion of the new laboratory for graduate study in Physics and Chemistry is looked forward to by the Department with enthusiasm. It is not considered desirable, however, to permit the number of graduate students to increase indefinitely. On the contrary it is believed that a definite restriction should be placed upon the number of graduate students accepted in order that the graduate student body may be composed of only exceptional students. A policy of restriction must evidently be put into effect

only after the development and testing of a kindly and practical plan of selection.

There is scarcely need of referring in any detail to the investigative work in progress in the Department beyond noting that interest in research pervades the entire Department. The generous support of this interest by the Institute Administration makes it inevitable that the definite contributions to the science will be of increasing value and importance.

It is possibly apropos to refer to the fact that in June the Second International Conference on the Properties of Steam was held in Berlin. One of the staff members was asked to serve as delegate and invited to present the results of the experimental work on steam obtained in the Research Laboratory of Physical Chemistry. It is a source of satisfaction to state that the values for the properties of high pressure steam adopted by the Conference are substantially those obtained in the Research Laboratory of Physical Chemistry.

The distressing conditions for graduate work in Organic Chemistry, incident to restoring to the Metallographic Department the large organic laboratory, will be completely ameliorated with the completion of the new laboratory for Physics and Chemistry. The new quarters will be the equal and indeed, it is believed, superior in quality to those of any university in the country.

The total number of graduate students has been forty-six, of which thirty-three are candidates for the degree of Doctor of Philosophy, two for the degree of Doctor of Science, ten for the degree of Master of Science and one special graduate student. Twenty-four of the graduate students majored in organic chemistry, eleven in physical and one in inorganic chemistry. Ten students were awarded graduate degrees in chemistry, five of whom received the Ph.D. degree.

The Department expresses its deep appreciation for the unstinted sympathetic interest and help given by the Visiting Committee. The Department resources in initiative and enthusiasm would be considerably less but for the support of its Visiting Committee.

The Department gratefully acknowledges the receipt of gifts of apparatus and equipment from the following firms: The American Neon Light Corporation, The Westinghouse Lamp

Company, the Polymet Manufacturing Corporation and the New Jersey Zinc Sales Company.

Chemical Engineering. The change in instruction in undergraduate thermodynamics, previously given in the Department of Mechanical Engineering, to a course more definitely chemical in viewpoint in the Department of Chemical Engineering has absorbed the interest of many of the staff during the past year. It is now apparent that, ultimately, this change will lead to minor changes in the work of the third and fourth years whereby the instruction in physical chemistry, industrial chemistry and chemical engineering will be better correlated.

During the summer session the Department offered two special courses in Petroleum Refining, registration for which was limited to men, with adequate training along engineering and chemical lines, who had also had industrial experience in petroleum refining or related industries. Twenty-five men from seventeen companies, representing all sections of the country, spent five weeks in intensive study and were sufficiently enthusiastic to request that advanced courses covering other phases of that industry be given next summer.

The enrollment of graduate students increased again, and this, in turn, was reflected in the graduate registration in the School of Chemical Engineering Practice reaching the maximum permissible.

Although the field stations of the School of Chemical Engineering Practice decrease the laboratory requirements of the Department, lack of sufficient space continues to be the greatest handicap under which the staff works, for, fortunately, resignations which for many years past have constituted a serious problem have somewhat decreased.

Fuel and Gas Engineering. The Department has tried to keep in mind the need for continuous modification of the subject matter of its courses to keep pace with the rapid changes made in the industrial processing and utilization of fuels. Illustrative of the work planned to keep the instruction up-to-date is the preparation of a comprehensive report on the theory and practice of modern powdered coal combustion. An additional new activity of the Department serving an allied purpose is the

preparation, by one of the members of the staff, of the Annual Fuels Progress Report of the American Society of Mechanical Engineers.

The Department of Fuel and Gas Engineering has taken over the instruction in the Automotive Fuels Course, formerly given by the Chemical Engineering Department.

Two important research projects have been initiated during the year. The first is a study of the mechanism of powdered coal combustion, studied from the standpoint of specific reaction rate at the surface of the individual particle. The second, a two-fold investigation sponsored by two large groups of public utilities companies, consists of (*a*) the development of a method of calibrating large capacity gas meters in place, and (*b*) the development of a method of calibrating moderate sized industrial gas meters, and its application to a study of errors inherent in commercial meters.

Encouraging progress was made in a number of the Department's research projects. The work on furnace design was partially reported in a paper on radiant heat transmission, presented to the Second World Power Conference. Experimental progress in the project of non-luminous gas radiation measurement was paralled by mathematical research on the problem. The study of suitable solvents for use in connection with the refining of lubricating oils has revealed a number of new solvents capable of differentiating between desirable and undesirable constituents. Two papers were published on the subject and the work is being continued. Research on the elimination of carbon monoxide, smoke and odor from automotive engine exhaust gases led to the development of a device which is capable of supplanting the muffler of an automotive engine, and which eliminates the undesirable constituents of the exhaust gases by auxiliary combustion. Other researches yielding papers during the year were those of industrial gas meter calibration, and the development of a two-color screen optical pyrometer for use in luminous flame furnace design work.

Building Construction. The course in Building Construction continues to show a normal growth, the enrollment for the year being 94 as compared with 87 for the year preceeding. In June, 21 men were graduated, and in spite of the busi-

ness depression, most of them found places in the industry without undue delay.

As far as the undergraduate work is concerned the course now seems to be well balanced and adequate to prepare its students for advanced positions in the various departments of the building industry, athough there is a tendency among builders to overlook the specialized training that students of this course have had, and to start them in the lower grades and in less important positions than they are qualified to occupy.

It will be necessary for the Department to acquaint prospective employers with the fact that the graduates are competent to take on responsibilities quite beyond those usually intrusted to young engineers who, as a rule, have little knowledge of the technique of building.

For many years, builders have complained that the graduates of our technical schools are of little use to them, because they are not acquainted with the use and assembly of materials although they may be competent to solve problems in structural design, in which subject, however, the builder is not particularly interested. The specialized training in this course is intended to overcome this deficiency, and to make the young engineers immediately useful to the builder.

During the year the Department was visited by a number of prominent builders, among them Col. William A. Starrett of Starrett Brothers; Mr. J. C. Hegeman and Mr. Louis Chevalier of Hegeman and Harris; Mr. J. R. Lotz of Stone and Webster; and Mr. William H. Nye of Turner Construction Company; all of whom were most commendatory in their opinions, not only of the schedule of the course but particularly of the manner in which it is taught.

In accordance with the suggestion made in a previous report, a course in Quantity Surveying and Estimating, under Mr. F. H. Hunter, has been incorporated in the second and third year schedules, and it is believed that this addition will strengthen the course in the eyes of many builders, as there seems to be a lack of qualified men in this department of building.

Some thought is being given to advanced work, for there is a large field for research in Building Construction, in which many methods, now accepted as the best practice, are wasteful

and uneconomic. It is intended, as soon as financial arrangements can be made, to provide opportunity for selected students to undertake original study in building methods.

The Horowitz Prize for the Class of 1930 was awarded to Mr. Reginald A. Bisson.

Geology. Professor W. Lindgren, head of the Department, who reached the retiring age during the year was asked to remain in charge of the Department for the coming year.

Professor H. W. Shimer continues in charge of the section of Paleontology and Geology (in part). Professor F. K. Morris, as before, has charge of General Geology for geological students and for those in Civil Engineering. Professor W. H. Newhouse still gives instruction in metallic and non-metallic mineral deposits, and the laboratory work connected with it.

Professor J. L. Gillson resigned at the beginning of the year and Dr. M. J. Buerger was made Assistant Professor of Mineralogy and Petrography.

As heretofore a course of lectures in coal and oil was given by Dr. W. L. Whitehead, and a course in Micropaleontology by Dr. J. A. Cushman. There were no changes of importance in the courses and the general plan of instruction.

The number of students in the Department was as follows: undergraduate students 10; graduate students 8; special students 3, a total of 21. The degree of Doctor of Philosophy was conferred on two students.

In considering the work of the Department it should be remembered that although there are comparatively few students in the course in Geology, a large number of students in other courses are given instruction in geological subjects. The total number of students in outside departments to whom instruction was given amounted to about one hundred and seventy. Besides this, three courses in General Study relating to Geology were given.

It will be noted that there are as many graduate students as undergraduate in this Department. Most of the graduate students come from other institutions of learning. It should also be borne in mind that there are comparatively few undergraduates who select Geology as their major study.

The collections of the Department of Geology, already

large, are being added to continuously. During the year one small metallographic microscope was purchased; also one much needed two-circle goniometer.

The Department points with some pride to the fact that its contributions to science have been comparatively numerous and sometimes important.

Professor Lindgren has continued the editing of his "Annotated Bibliography of Economic Geology" issued under the auspices of the National Research Council. He also spent part of the summer in investigating, for private companies, sulphur deposits in Texas.

Professor Shimer has devoted a large amount of time to the revision of his important volume on "Index Fossils."

Professor Morris has continued the editing of his work on the expedition on the geology of Mongolia.

Professor Newhouse was given opportunity by the Corporation to undertake a three-months trip in the western states with a view of familiarizing himself with the ore deposits of that region.

Professor Buerger has been at work on a textbook of optical crystallography.

In a Department of this kind there is constant need for new instruments and appliances of various kind. It is recommended that special allotments be given for the purpose of new grinding apparatus for polished sections, and also that three new metallographic microscopes be purchased.

The problem of adequate instruction in the science of Geophysics still awaits a satisfactory conclusion. It is recommended that an attempt be made to secure the services of a man able to teach geophysics from a general and scientific standpoint.

Mathematics. During the year there have been no very important changes in the general mathematical courses. The list of electives and graduate courses has been increased by the addition of Algebra of Quantum Theory, given by Professor Hitchcock. The number of undergraduate courses has been increased by two courses given to Course VIII students, namely: Higher Algebra and Geometry for second-year students, given

by Professor Franklin, and Elements of Analysis for third-year students, given by Professor Phillips.

Particularly significant has been the completion of requirements for the doctorate by four candidates, the largest number for a single year in the history of the Department.

Changes of personnel effective for the coming year have been unusually numerous. The retirement of the head of the Department and the leave of absence of Professor Phillips have led to the appointment of Professor Woods as head and of Dr. Jesse Douglas, National Research Council Fellow, as Assistant Professor for the year, while Mr. H. A. Giddings, Mr. J. G. Estes and Mr. Edward J. M. Pease have been appointed to half-time instructorships.

Professor Tyler's connection with the Department dates from his graduation in 1884, at which time mathematical instruction was given wholly by Professors Runkle, Osborne and Wells, the program including college algebra, solid geometry, trigonometry, analytic geometry and calculus, with elements of differential equations, determinants and theory of equations as occasional electives. As to some extent in the case of his seniors, Professor Tyler's time was considerably engaged by various administrative duties, including the secretaryship of the Faculty (1889–90, 1901–06) and of the Executive Committee of the Corporation (1891–1900). He was appointed head of the Department in 1901, but had been informally responsible for appointments, etc., for some years before.

The history of the Department during this third of a century has naturally not been highly eventful, but it has profited by the general progress of the Institute and has sought to contribute its full share to that progress. Particular mention may be made of the development of the Runkle Library, recently substantially favored by the Osborne bequest; of the establishment of the Journal of Mathematics and Physics in 1921; of the steady increase in scientific interest and productivity; and in the number of graduate courses and students; of the evolution during the past twenty years of the present undergraduate curriculum as embodied in the Woods and Bailey texts.

The aims consistently sought during these years have been:

a. The maintenance of the best undergraduate teaching, with active participation of senior members in the elementary instruction;

b. Helpful coöperative relations with other departments, with recognition of the fact that mathematics, while an invaluable tool, is much more;

c. Increasing encouragement of research.

While these aims are quite compatible with each other, the preservation of a just balance among them has required careful judgment and constant effort.

English and History. The revision of the first-year program by the Faculty has affected the instruction given by this Department in two ways. The number of hours a week has been reduced from eight to six; and in place of a course in which the emphasis was on History, the work in composition being subordinate, a course has been authorized of which training in the writing of English will be the main purpose.

Since this training, to be effective, requires frequent conference between the student and the instructor, it is planned to increase the number of conferences per term. At the same time, the size of the sections will be reduced from thirty to twenty-five men, these changes being made possible by an increase in the staff of the Department. In making up the sections, students of the same degree of proficiency in writing will be grouped together, and special attention will be given to those who prove to be deficient in the fundamentals of composition. All members of the Department will take part in giving the course.

Since the Committee on the Revision of the Curriculum of the First Two Years, on whose recommendation the action of the Faculty was based, has not yet reported on the second year, the place of History in the curriculum is yet to be determined. It is hoped that it will be incorporated in the program of the second year, where a term devoted to European History since 1870 can be advantageously used in broadening the student's outlook and in providing material for his written work.

Most important of all is it that the total amount of time devoted to English should not be reduced. The hours by which the instruction in the first year has been cut down should be made good in the upper years, preferably by the introduction of the course in Report Writing, which has already a place in the third-year program of several of the professional courses, and which has been given successfully for a number of years.

Romance Languages. For the first time in several years, Italian, cancelled during the war, has been announced to be given in 1930–1931.

Classes during the past year have been larger than usual. For the first time the number of students in the advanced French course for architects of the first year, has necessitated two sections, which, as an experiment, were made up on the basis of scholarship. The results obtained were gratifying in the better section, but less satisfactory in the other. The imported illustrated reading material used in some of the courses has greatly stimulated interest, especially in the fields of architecture and aviation.

Professor Langley and Mr. Koch have spent part of the summer in Europe, selecting while there the latest educational material appropriate for use in the various courses.

Mr. Dougherty has resigned from his position as Instructor in French. His place will be taken by Mr. Richard F. Koch.

During the war, with the consequent shrinking of the Foreign Language staff, one of the large office rooms was assigned to another Department. As conditions have become more normal and the Department has increased to about its former size, the Department is seriously cramped for room. The Modern Language Library is now encumbered with three instructors' desks; we have no storeroom of our own for maps, charts, and other large equipment. One great need is that of a reasonably sound-proof phonograph room. We have now available admirable records of complete oral language courses, with the accompanying texts in both the foreign language and English; also scenes from great plays rendered by famous actors; a form of equipment that would provide excellent aid in the acquisition of a good pronunciation and a wide vocabulary.

German. The year began with an increase by a small number of students over the previous year. The class instruction was given by Professor Vogel and Professor Kurrelmeyer and Mr. Currier. The grades of work were elementary, intermediate and advanced.

The elementary course followed a thorough system of work inculcating the necessary fundamentals of German with written exercises. The reading of a few humorous stories then

followed with writing of sentences based on the text read from English into German, thereby reviewing the most important principles from time to time. The students displayed more interest in their work than in the few preceding years, and the results for the year were very good.

The intermediate course began with the reading of a story and a review of the main points in German by translating English into German of phrases and sentences based on the texts read. The work was graded and followed along during the year, becoming more and more difficult and advancing to scientific German. There was great interest displayed and good results attained.

The advanced course presumed a fair vocabulary of German and treated both literary and scientific German. One course was devoted to aeronautical German and was apparently enjoyed by the students.

There were also two courses of advanced grade, counting as electives. One made use of a German magazine whereby rapid reading, conversation and writing were exercised with very good results.

Military Science. The courses given by the Department of Military Science and Tactics have been reinforced by the requirement that all students registered for Advanced Military Science devote at least one hour per week to practical instruction in Drill and Command. This will give all advanced students an opportunity to receive instruction in handling men and will enable the instructor to determine to a certain extent their capacity and capabilities along such lines.

The grading of an additional area west of the drill field has greatly improved the facilities for drills and ceremonies and will be of material assistance in the additional work in Drill and Command with the advanced students.

During the past year special attention has been devoted to instruction in rifle and pistol marksmanship both in the regular drill periods and as a student activity.

The R. O. T. C., varsity, and freshman rifle teams made excellent showings in intercollegiate and N. R. A. matches during the year. The greatly increased interest shown by the student body in both rifle and pistol shooting has made additional

range facilities a pressing problem of the immediate future. A gallery range with twenty firing points is urgently needed to insure adequate instruction of students interested in marksmanship.

The military band, organized from the first year students, made an excellent showing under the able direction of Warrant Officer Eric Svensson, United States Army, retired, and the appointment of Mr. Svensson as an instructor for the coming year insures the continued success of the band.

The War Department has adopted a distinctive R. O. T. C. olive drab uniform. This uniform will be issued for the first time at the beginning of the new academic year and will result in a decided improvement in the appearance of the student battalion.

Hygiene. The Homberg Memorial Infirmary has, in its second year, assumed the aspects of a metropolitan hospital, as illustrated by the figures below. Judging by the letters received from our alumni, the work of the Department in the past has apparently not been in vain, as we have received from our graduates, not only in the United States but in foreign lands, many requests for advice and information. We might well be called an international clinic.

There were 24,175 calls made during the year 1929–30, as compared with 19,051 calls during the year 1928–29 — an increase of 5,124. These calls were subdivided as follows:

Surgical	8,619
Medical (Contagious 25)	9,915
Complete Physical Examinations	915
Re-examinations	1,726
Total	24,175

In the endeavor to safeguard the health of the student body, physical examinations were required of each student every year. Out of a total enrollment of 3,066 only 2,641 were examined. The remaining 425 were dropped from the Institute at mid-year, or were graduate students who failed to comply with repeated requests by letter. Next year we look forward to examining every member of the student body and we feel sure

that Technology men will avail themselves of this valuable privilege.

A most intensive checkup was made of all men having defects. Many were checked up every month, or more frequently, depending upon the seriousness of the defect. It is the aim of the Medical Director to segregate these men so that they may be classified and arranged in groups for observation and advice.

The Bacteriological Laboratory has kept pace with the Department, 765 tests being made during the year.

The tests were as follows:

Chemical Urines	423
Cultures	36
Blood tests (red counts)	25
(white counts)	55
(differential counts)	55
Hemoglobin	32
Compatibility	13
Wasserman tests	20
Widal tests	5
Malaria	2
Blood cultures	2
Platelet counts	2
Coagulation time	1
Blood sugar	1
Typhoid inoculations	27
Smallpox vaccinations	11
Smears examined for gonococci	10
Smears examined for Vincent's	14
Feces examinations	5
Sputum for tubercle bacilli	8
Stomach contents examinations	3
Vaccines made	8
Pathological examinations	4
Hay fever tests	2
Basal metabolism	1
Total	765

There were 195 patients admitted and treated in the Infirmary, only one of whom died. This patient died of septicemia.

Division of Industrial Coöperation and Research. During the year the personnel work of the Division of Industrial

Coöperation and Research has been further extended, and more convenient quarters have been provided. The number of representatives of the large industrial companies who have requested arrangements to enable them to interview members of the graduating class has been larger than ever before, and the Division's new offices will greatly facilitate arranging for suitable contacts between the students and their prospective employers. The inclusion of this special personnel service in the activities of the Division has markedly extended its contacts with industry.

A larger percentage of the industrial activities of the staff of the Institute has been carried on through the Division, and the method adopted last year of making an overhead charge for such work as is done in the laboratories has proved practical, and is to be continued. To a greater extent the members of the staff are bringing industrial inquiries to the Division for supervision and planning. This is especially helpful where work underway involves the staff members of several departments.

A number of investigations begun some time ago have been continued, and many new problems have been brought to the Division for study. The administrative work has greatly increased during the year, and hereafter Professor Norton will devote his entire time to its direction. It is hoped that the Division may soon be provided with some suitable place in which much of the industrial research involving the more heavy and bulky equipment may be carried on without undue interference with the regular laboratories devoted to instruction.

Division of Municipal and Industrial Research. In general it may be stated that in respect to the number of field surveys completed, compensation for field work, public notice received and contacts made, the present year represents a gratifying increase over 1929. While the work of the Division has to a large extent developed along lines previously followed, certain new trends in the industrial survey field have had to be recognized and our methods modified accordingly. Thus, while the Division has not discarded the practice of making complete industrial inventories in its surveys, it has been evident that greater effectiveness results through concentration on the more pertinent phases of the survey. This applies whether the work

includes the preparation of a comprehensive report by our own staff or the supervision of field work done by others.

There is an increasing tendency on the part of community organizations, such as chambers of commerce, to undertake their own industrial studies through the employment of local industrial directors and there has been a multiplication of professional and commercial agencies offering industrial survey service. However, as an offset to these tendencies, the adoption of the industrial survey method by large private industrial organizations — in particular the public utilities — offers us the possibility of a greatly enlarged scope of activity.

During the year the Division has completed five surveys as follows:

Summary Report of Bangor-Brewer, Maine, completed August 1929.
Industrial Survey of New Hampshire, completed December 1929.
Industrial Survey of Baton Rouge, La., completed February 1930.
Report on Municipal and Industrial Conditions in Somerville, Mass., completed June 1930.
Industrial Survey of Vermont, completed July 1930.

The Division is now engaged in an industrial survey of El Paso, Texas, which will probably be completed by the early fall.

It will be noticed that four of the above studies relate to individual communities, whereas two are regional in character. The community studies were all locally financed, either by business groups, by the municipality, or by both; the regional surveys were financed by a private utility organization, the New England Power Association.

Peculiar interest attaches to the first study included in the list — that of Bangor-Brewer, Maine — as it marks the first use of summary reports for public distribution instead of the complete report. The Division is convinced that the preparation and distribution of these summary reports is decidedly more effective in arousing public interest, and is of course much less expensive, than the publication of the complete study.

The New Hampshire survey, which represented our first contact with the New England Power Association, was the direct means of securing the Vermont study, indicating the satisfactory character of the former. In each case the field data were secured by the staff of the Association, working partly under our direction; we were responsible for the analysis of the

data and the preparation of the report. These are regional studies and indicate, as do the Baton Rouge and El Paso investigations, the increasing interest of public utility organizations in problems of industrial development, a situation which holds encouraging possibilities for the Division.

The industrial survey for Baton Rouge, Louisiana, was secured through contacts established with the Stone & Webster interests of Boston and marked the first extension of the Division's activities outside of New England. Satisfaction with this work is evident in a new survey — that of El Paso, Texas, which has recently been secured through the same channels.

The Somerville survey, while it contains a section on industrial development, was primarily an analysis of the organization and administration of the local government and represents our first contract of this description. It was financed entirely by the municipality. Approximately one hundred fifty specific recommendations in the interest of more efficient governmental methods resulted from this study and are at present being considered by the municipal authorities. During the course of this survey our representative was able to render much practical assistance to the mayor of the city in the preparation of the annual budget and in the formulation of a program for financing public improvements, instances of a type of service which, given the opportunity, could be expanded indefinitely.

While these field surveys have not sufficed to place the Division upon a self-sustaining basis, this objective has been more nearly obtained than in the previous year. With increased and continuous effort on sales promotion it is believed that the proportional return from field work can be still further increased.

Other activities of the Division during the year have included the publication of a series of bulletins for general distribution, the conduct of incidental research and general promotional efforts.

Five bulletins have been issued as follows:

Is Community Research Advisable, September 1929.
The Municipal Problem, November 1929.
Industrial Problems of the Community, January 1930.
Temporary Tax Loans, March 1930.
Effective Industrial Surveys, July 1930.

These have attracted considerable notice in the New England press and in one case, that of the Somerville survey, the retention of the Division was the direct result of the second bulletin of this series. In view of the slight cost of these publications and the increasing interest which they have aroused, it is believed that they should constitute a permanent feature of the Division's work.

Incidental research studies have been made during the year in connection with our published bulletins and with others contemplated for future release. Emphasis upon research as a continuing feature of our work, while desirable, is not warranted by the finances of the Division and must wait upon the provision of special funds for this purpose.

In view of conditions outlined at the beginning of this report it is evident that greater emphasis upon selling, with increased utilization of members of the organization for sales purposes, must from now on be regarded as a necessary charge upon the work. It is furthermore proposed to include in future estimates of cost a more liberal allowance for overhead expense. These two steps should improve our financial status.

The personnel of the Division has been unchanged during the year. There are five staff members, one of whom is on an extended leave of absence with the Federal Trade Commission. Of the four active members two devote their time to the industrial side of the work, and two to its municipal aspects. One of the latter has been acting as director of the Division the past year pending the appointment of a successor to Professor Bassett.

The Industrial Development Bureau of the City of Boston has recently requested the Division to state its views with reference to a possible study of the Boston Port situation and to estimate the cost of such an investigation. This has been done.

Inquiries received from many sources, together with requests for our published material, indicate that the Division is becoming more widely known and its standards of work better appreciated. With the passing of the current recession in general business throughout the country a definite "follow-up" of many of these contacts is anticipated.

The Division is emphasizing the value of its services in the study of special problems arising in the carrying out of recom-

mendations made in its surveys. As the number of completed projects increases, it is believed that the need for supplementary studies of this sort will become apparent to our clients.

Dean of Undergraduate Students. The encouraging fact of an increasing number of applicants qualifying for admission to the freshman class is to be noted for the third successive year in the registration of the Class of 1933 which entered in September, 1929, with an increase of twenty-five over the freshman class of 1932. In 1926–27 the registration included 495 freshmen; in 1927–28, 592; in 1928–29, 668; in 1929–30, 693.

The real significance of these added numbers lies in the possibility afforded the Institute to be more selective in the applicants it accepts. Some of the factors responsible for the trend were dealt with in this portion of the President's Report a year ago, but the value of the visitation of secondary schools by members of the Faculty and the Director of Admissions has been redemonstrated during 1929–30. In the Report of last year mention was also made of the "mortality" studies being carried out by the Director of Admissions and the Dean. These have been extended and reinforce the conclusion that the present entrance examination method of selecting freshmen provides the best available means of measuring intellectual promise.

Experience shows, however, that "student mortality" is not always due to lack of intellectual promise, nor can poor or inadequate preparation be held accountable. For success at the Institute, good character, health, and financial stability are essential qualities. The first-named is so fundamental as to need no special elaboration here.

Concern for student health has long been a part of the Institute's program, and this year, the second since it was opened, the Homberg Infirmary has again demonstrated its value. Also this past year was the second year of the annual physical examination required of all students, and its results have amply justified the necessary outlay in time and money.

Adequate housing constitutes an important feature in plans for conserving student health, and during 1929–30 ground was broken for a new dormitory to provide additional facilities for two hundred students. It is to be ready in the autumn of 1930 and will bring the total dormitory capacity of the Institute to

six hundred thirty. As recommended by the committee comprising representatives of the Corporation, Faculty, Alumni and Undergraduates, which in the spring of 1928 exhaustively canvassed the housing situation, the new unit will maintain the traditional policy of "aiming to provide a maximum of necessary comforts and livability without luxury."

While it is to be hoped that in time further units may be erected, the idea of increasing dormitory facilities in steps of but one to two hundred occupants at a time has a great deal in its favor. A more sizable increment in a single year might seriously disturb the administration of our dormitories, which up to now has been outstandingly successful, due to the coöperative good feeling which has developed between the undergraduate dormitory government and the Dormitory Board which represents the President. It might also affect the highly satisfactory condition present since the original dormitory was opened in 1916, whereby more students wish to live in the dormitories than can be accommodated. When an occupant knows that some fellow-student would be quite willing to take over his lease at the first opportunity, the disciplinary problems of any dormitory system are greatly simplified.

Still a third feature in promoting the physical well-being of the undergraduate body is the roster of competitive sports which has been expanded during 1929–30. Lacrosse, initiated during 1928–29 as an experiment, proved to meet a real student need, and has now received full formal recognition from the Advisory Council on Athletics. Squash, for some years a highly popular club game, is now making a real bid for recognition as a college sport and, within a year or two, the Institute may expect to add a squash team to its other athletic activities. Through the generous provision of the Corporation, eight courts are available and their constant use testifies to the hold that this game has established on the undergraduates.

Last year Institute crews made their first essay at Poughkeepsie but the outcome left much to be desired, as our Varsity, with those of three other institutions, sank in the rough water before the finish line. This year Technology took third place among the nine Varsity contestants in a season when collegiate competition was unusually keen and of a high order of excellence.

Since the last President's Report was rendered Bulletin No. 23 of the Carnegie Foundation for the Advancement of Teaching has appeared. This is the end result of a three-year study of college athletics throughout the United States and it is a highly constructive piece of work, not only finding many grounds for adverse criticism, but offering suggestions from which much may be hoped for the betterment of conditions. Of the many collegiate institutions convassed in the study, less than twenty received an entirely favorable report, and among these was the Institute.

Recognizing that our method for the conduct of athletics is unique in that a ruling voice is delegated to the student body, this finding is peculiarly gratifying and, as an independent estimate of the mature competency and efficiency of our student body it offers a pleasing endorsement of the policies of the Advisory Council on Athletics.

These, in no small measure, derive from the far-seeing wisdom and judgment of the late Major Frank H. Briggs, '81, who organized undergraduate sport in the late Nineties and in so doing outlined a program which is still followed in all essential details. His demise last spring left a place that may not be filled, but his work lives after him, a worthy monument of his single-hearted effort to make the administration of athletics at Technology a model for our sister institutions.

True to his alma mater and his devotion to the undergraduate cause he bequeathed his entire estate to the Institute for the legitimate promotion of student sport when certain life interests to relatives shall have lapsed. A characteristically gracious feature is the delegation to his younger colleagues on the Advisory Council on Athletics of the administration of the fund.

Means for aiding the intellectually worthy but financially insecure student have existed for many years at the Institute and the monies at hand for undergraduate scholarships have steadily risen and quadrupled in a decade. For the fourth successive year the administration of the scholarship aid to undergraduates has been a responsibility of the Dean. During 1929–30 awards were made to 398 men and 16 women, totalling $77,697 and $4,850 respectively. For 1930–31 the funds available are somewhat larger and tentative assignments to 426

men and 11 women, totalling $86,690 and $4,850 respectively, have been made.

Also loan funds for students have existed for some years, and experience with these has shown that with proper management repayment of all but a very small percentage of student loans may be expected. The establishment of the Technology Loan Fund towards the close of the academic year provides for a future extension during 1930–31 and thereafter of loans towards tuition payments on a scale much greater than heretofore. With the scholarship aid now possible and the liberal provisions of the Technology Loan Fund, the Institute's necessarily high tuition fees need not constitute an insurmountable barrier to students of ability and promise but of limited financial means.

Disciplinary cases during 1929–30 included six students who were dismissed by the Faculty and three who were placed on probation by the Dean for academic misdemeanors. Two other students were required to withdraw from the Institute by the President on account of misconduct.

Because of poor scholarship, 227 were dismissed by the Faculty during 1929–30 and 166 were advised to withdraw. Those dismissed in 1928–29, 1927–28, and 1926–27 numbered 147, 146, and 145, respectively.

The relatively higher number dropped during the current year reflects not only the growing conviction of Registration Officers that early elimination of those unsuited for Institute work makes for the best interests of all concerned, but the efficacy of computing a cumulative index showing whether a student's scholarship is improving or the reverse. Such a measure of the academic horse power of each student has become available this past year through the earnest effort of the Registrar and the indices have been used informally by the Faculty committees in reviewing term grades.

From the informal employment of such data may in time come formal changes in the Institute's method of disqualifying those unable, or unwilling, to maintain its academic standards. Particularly does the data commend itself as of value in preventing the too common tragedy of a boy doomed to the depression of failure at Technology only after it is too late for him to enter upon some different form of higher education for which he might possess aptitude and interest.

Dean of Graduate Students. The number of students pursuing courses leading to higher degrees was as of November 1, 421, the largest in the history of the Institute. The degrees for which these students were registered were:

Doctor of Philosophy	55
Doctor of Science	61
Doctor in Public Health	1
Master of Science	296
Master in Architecture	8

In this group were citizens from forty-one states of the Union and twenty-six foreign countries. One hundred fifty-one colleges, universities and technical schools were represented, of which twenty-four were outside the United States. The Departments of Chemistry, Chemical Engineering and Electrical Engineering continue to attract the largest enrollment of graduate students. The School of Chemical Engineering Practice and the Coöperative Courses in Electrical Engineering account for the large registration for the Master's degree in the two last named Departments. Graduate students were, however, registered in every Department of the Institute. It is interesting to note that nearly 60 per cent of all graduate students made their Bachelors' degrees at other institutions than Technology. Thus, of the 421 students, 41 per cent had received degrees from the Institute, 53 per cent from other institutions in the United States and 6 per cent from foreign universities. One hundred and ten, or about 25 per cent, were working for higher degrees while serving as full or part-time members of the instructing staff. Of these, 52 were pursuing courses leading towards the Doctorate and 58 towards the Master's degree. While the time required to meet the requirements of a higher degree in these cases is necessarily considerably increased, the inducement thus offered attracts men who otherwise could not afford to continue their study.

Among the foreign students the past year were those coming under the C. R. B. Educational Foundation, the Commonwealth Fund and the International Student Exchange. In the latter group were representatives from Germany, Switzerland and Italy. These men with their varied interests, training and points of view are a valuable addition to the graduate school. It is greatly to be regretted, however, that at present graduate

students have so little opportunity of meeting others engaged in advanced study and research outside of their own particular field of work. This has often been commented upon by the students themselves, particularly by those coming from abroad. This condition can be remedied only by providing a suitable dormitory exclusively for graduate students with a common lounge or meeting room where the men may become acquainted with one another. Such a unit should preferably be detached from the undergraduate dormitories for obvious reasons. Now that the undergraduates are well provided with attractive living quarters it is hoped that consideration may next be given to the needs of the graduate students.

The number of advanced degrees awarded during the past year was 218, distributed as follows:

Doctor of Philosophy	10
Doctor of Science	19
Doctor in Public Health	1
Master of Science	181
Master in Architecture	7
Total	218

The new requirements for the Master's degree discussed in the report a year ago, have been in operation during the past year with results generally satisfactory to all Departments and to the Committee on Graduate Courses and Scholarships. While greater latitude in the admission to candidacy is now allowed than formerly, the standard of accomplishment for the degree as measured by the amount of strictly graduate work required has been raised. The present requirements are proving more attractive to graduates of other colleges who desire to pursue advanced work at the Institute, and this will be reflected in the future by the greater number of degrees awarded with specification of field of study. In connection with the new regulations which require at least seventy-five per cent of the work for the degree of Master of Science to be chosen from "A" courses primarily for graduates, the Committee on Graduate Courses and Scholarships has carefully revised, during the past year, the list of all "A"and "B" subjects which may be counted towards higher degrees.

Students with Bachelors' degrees from institutions of rec-

ognized standing who, with the approval of their Department, enter upon a course of study leading to a higher degree are now classified as "Graduate Students" even though their preparation be such that considerable undergraduate work must be taken before advanced courses may be begun. This is frequently the case with students coming to the Institute with a Bachelor of Arts degree. Students with degrees from institutions whose academic standing is not well recognized may enter upon a course of study leading ultimately to a higher degree, but until such time as they have demonstrated their ability to do advanced work are classified as special students. Graduate and other students pursuing courses without reference to a higher degree are also so classified. The status of graduates of small colleges whose academic standing is questionable has always been a difficult one. Not infrequently men coming from such colleges have great ability and make excellent records; the policy has been to treat each case on its individual merits, and as soon as a student has demonstrated his ability, to transfer him from the "Special" to the "Graduate" group without requiring him to take a Bachelor's degree at the Institute as a prerequisite for the Master's or Doctor's degree.

Although funds appropriated for graduate scholarships were augmented to meet the last increase in tuition, the applications for aid far exceeded the amount available. One hundred ninety-three awards were made although the applications numbered two hundred eighty-six. As awards are based primarily on scholastic standing, the system of rating recently introduced by the Registrar is proving of assistance in determining the relative standing of students in different departments. The competition for travelling scholarships for study abroad is becoming keener each year. It would be a fine thing if such a Travelling Scholarship were available annually to an outstanding student or junior member of the staff in every Department. The recent establishment by President Stratton of Institute Travelling Fellowships is a step in this direction. The new Loan Fund should prove of great assistance to graduate students. As a rule these are men of exceptional ability who in many cases would not need to borrow for more than one year before receiving the Master's degree; a longer time of course for the Doctor's degree. Their increased earning power after graduation should

enable them to liquidate their debt in a relatively short time. On the other hand, outright scholarships open to the ablest men should not only be maintained at their present amount but further increased. Endowed fellowships carrying five hundred dollars, which at the time of their establishment thirty or forty years ago were considered munificent, will suffice next year to pay only the cost of tuition, and must be increased from other sources if the recipient is to have anything to apply towards his living expense.

Students at Harvard University and the Institute are availing themselves of the privilege of taking courses at the other institution respectively to an increasing extent each year. During the past year five Harvard students came to the Institute for courses in Geology, Chemistry and Aeronautical Engineering, and twelve Institute students attended graduate courses at Harvard, in the Departments of Business Administration, Sanitary Engineering and Astronomy. The courses offered in the Graduate School of Business Administration have proved particularly attractive to our students, and the very cordial way in which they have been admitted even to crowded classes by the Dean and by the professors concerned, is greatly appreciated.

Society of Arts. The usual series of Popular Science lectures was given to pupils of the secondary schools in and about Boston on Friday and Saturday afternoons during the months of December, January, February and March. The lectures well illustrated were also repeated on Sunday afternoons for the benefit of the general public. The demand for tickets for all of these lectures far exceeded the seating capacity of the large lecture room and standing room was often at a premium. On one occasion over two hundred persons had to be turned away at one of the Sunday afternoon lectures. So great was the interest in Professor Bunker's lecture on "From Molecule to Man," that requests for its repetition were made not only to the secretary of the Society, but in the daily press.

The topics chosen for the lectures this year covered a wide field and had never been previously presented before audiences of the Society of Arts.

"A Geologist's Travels in the Gobi Desert" was given by

Professor F. K. Morris, M.A. of the Department of Geology. Professor Morris spoke from personal experiences in the desert, and illustrated his lecture with many beautiful colored slides and specimens which he had collected.

"From Molecule to Man" was given by Professor John W. M. Bunker, Ph.D. of the Department of Biology and Public Health. Professor Bunker projected living organisms so that they were visible to the large audience, and by modeling in wax, illustrated biological growth and development.

"The Romance of Metals" was given by Professor Robert S. Williams, Ph.D. of the Department of Mining and Metallurgy. A striking feature of this lecture was the projection of the structure of metals and alloys.

"Electricity and its Chemical Effects" was given by Professor M. deKay Thompson, Ph.D. of the Department of Physics and Electrochemistry. This border-line field of science was fully illustrated by experiments of fundamental discoveries which have led in their application to the modern electrochemical industries.

The Librarian. The home use of the Institute Library showed a marked increase during the past year. A comparison with the figures of five years ago is interesting.

	1924–25	1929–30
Books borrowed from the Central Library	18,706	28,749
Books borrowed from the branch libraries	10,702	16,164
Total	29,408	44,913

In addition to the above there were circulated from the Architecture branch 11,500 prints. (In previous reports prints have been counted in with books.)

Volumes borrowed on interlibrary loan decreased slightly from 496 in the previous year to 463; volumes lent increased from 768 to 902. Photostat prints were supplied in response to about 100 requests.

The net increase in the Library in 1929–30 after allowing for books discarded or lost was as follows:

Volumes added to the Central Library	2,744
Volumes added to the branch libraries	1,984
Total	4,728

The year's expenditures for books, periodicals and binding are shown in the following table:

	Books	Periodicals	Binding	Total
From Library Appropriation	$5,583.84	$5,020.09	$3,111.58	$13,715.51
From Endowment Funds	2,768.68	10.50	41.88	2,821.06
From Departmental Appropriations	733.59	448.69	19.04	1,201.32
Total	$9,086.11	$5,479.28	$3,172.50	$17,737.89

Total volumes in the Institute Library and branches June 30, 1930: 262,566.

The volumes in the branches are distributed as follows:

Aeronautics	2,875
Architecture	5,721
Civil Engineering	3,418
Economics	5,007
Geology	3,349
Mathematics	3,578
Mining and Metallurgy	7,937
Modern Languages	1,527
Naval Architecture	3,623
Walker Memorial	8,206
Others	3,213
Total	48,454

The ever-increasing flow of printed material into a college library is a standing challenge to the ability of the library to cope with it, that is, to select what is valuable, catalog it and make it promptly available to the men who need it. Recognizing that some of our cataloging methods were inadequate to the problem, the Librarian called upon an expert in cataloging efficiency, Mrs. Frances R. Coe of the Massachusetts State Library, to study our internal organization and make recommendations. Through the courtesy of Mr. Edward H. Redstone, State Librarian, Mrs. Coe was granted a week's leave of absence, which she spent at the Institute Library, carefully investigating our present methods of handling books and other material from the time of their arrival at the Library till they are placed in the hands of the reader. She submitted a valuable report recommending a systematic plan of reorganization. As this plan was based on extensive use of Library of Congress catalog cards, its adoption was set for July 1, 1930, when a budget appropriation covering the use of L. C. cards will be

available. The accompanying changes in routine are expected to speed up the cataloging of new material.

There remains, however, urgent need for reconstructive work upon thousands of old cards already in the catalog. This is a problem by itself which will require additional workers for two and perhaps more years. The importance of work done in perfecting the catalog does not impress itself upon the average user even of a college library, but it is highly essential to good service; supremely so in our library in view of the rapid changes in science and technology in the years since the library was first cataloged. The original cataloging, moreover, was unevenly done, some of it inadequately, to save time or expense, some of it from an academic standpoint without sufficient recognition of the scientific relationships involved.

A beginning upon this work, so far as the electrical engineering cards in the catalog are concerned, was made in 1927–28, when Mr. William R. Brewster was engaged for several months to revise subject headings; and further progress was made possible during the past year through the appropriation of $1,500 from the Vail fund. Of this amount approximately $500 was spent for books and $1,000 for the services of a special assistant whose time was devoted principally to catalog revision in this field.

At this point it seems appropriate to refer to the Vail bequest out of the income from which this appropriation was made. The late Theodore N. Vail, whose interest in the promotion of electrical research at the Institute led to the gift in 1913 of the Vail Library by the American Telephone and Telegraph Company, of which he was then president, and to later gifts by the same company for the maintenance of the collection, provided in his will that one-eighth of the residue of his estate should come to the Institute "for the benefit of the Vail Library, absolutely and forever." This gift was accepted by the Institute in 1921, and amounted on June 30, 1930, to $45,401.96.

The Faculty Committee on the Library this year consisted of Professors Goodwin (chairman), Jackson, Keyes, Pearson, and S. C. Prescott. The Librarian also attended these meetings. The plan adopted by the committee regulating the expenditure of departmental allotments and setting apart a reserve fund to

be used late in the year for books not needed for earlier use, has worked well from an economy standpoint but only fairly well from the point of view of service. It has tended somewhat to hamper the prompt purchase of needed books during the months of greatest activity in teaching and research and to encourage liberal use of the reserve fund for less urgent books in the latter months of the school year, when the acute need is over.

No plan, however, will be wholly satisfactory without an increase in the annual appropriation for books and periodicals. That appropriation should be large enough to allow greater freedom and promptitude in the acquisition of books during the most active months of the academic year.

A step for the saving of readers' time was taken this year in the preparation of two visible indexes to periodicals. One of current periodicals, covering about 2,150 titles, is kept in the main reading room and one showing all back files, covering about 3,700 titles, is in the periodical stack. The preparation of these lists required over a year of careful work, and the cost of the equipment was high. They have, however, had such constant use and warm approval from readers as more than to justify the undertaking.

Work upon the printed catalog for Walker Memorial Library had proceeded to the point where it was nearly ready for the printer when the losses from that library were found to have been so large that it was decided to delay printing until the more important books lost could be replaced. It should be possible to do this and complete the catalog within the coming year.

The usual leaflet of information concerning the Library was sent out to new students in advance of the fall term. On the occasion of the five-year All-Technology Reunion in June, the Library prepared an eight-page leaflet listing the latest books in science and engineering and suggesting ways of coöperation between the Library and the alumni. These were distributed with the reunion programs to all who registered.

A regular meeting of the Special Libraries Association of Boston, with which the Institute Library is affiliated, was held at the Institute on the evening of January 27. Those present, to the number of ninety-two, were guests of the Institute at dinner, after which they listened to addresses by Dr. Tryon on

the varied work of the Institute, by Professor Huntress on "The Chemist Looks at the Library" and by Professor J. A. Stratton on "The Uncertainty Principle in Modern Physics." Appreciation of the hospitality of the Institute was expressed formally by the association and personally by many of those present.

Mrs. Maynard, Vail Librarian, served as chairman of the Nominating Committee of the above-mentioned association. She also continued as chairman of the Electrical Engineering Committee of the National Special Libraries Association, in which capacity she has been preparing for early publication a list of "Recently published bibliographies in electrical engineering, 1918–1929." In connection with a course in bibliography and the history of printing which she took at Radcliffe College during the year she prepared in manuscript an annotated bibliography on "The Forerunners and Followers of William Gilbert." At the request of the American Telephone and Telegraph Company, she prepared an exhibit of publications and photographs having to do with the Vail Library, for deposit in the Ford Museum at Dearborn, Michigan.

The chief physical improvement of the year was the laying of rubber tile flooring in the main reading room. Although this involved large expense, it has accomplished to a considerable extent the end sought, namely reduction of noise in a room where quiet is necessary. Other improvements were the addition of service shelves along the walls of the cataloging room, the electrifying of the book lift and the addition of more study tables and chairs in the stacks.

In connection with the record of gifts which follows, the Librarian wishes to call the attention of members of the Instructing Staff to the "Technology Collection" which is maintained to preserve all possible material published by or about the Institute and Technology men and women. Contributions of material to this collection are desired; particularly of books or other publications by members of the Instructing Staff and alumni. The collection is kept in a locked room, as archive material. It is not allowed to circulate but may be seen at any time by responsible persons.

At the time that Stone & Webster, Inc. decided to break up their library, which had been one of the leading special libraries

of the country in the field of public utility engineering, the Institute Library, with others, was given the opportunity to select from a residue of volumes not required by officers of the firm. This valuable gift amounted to two hundred volumes, including a complete set of A. I. E. E. Transactions.

Next in order of size was the gift from Hon. Edward P. Warner, '17, former head of the Department of Aeronautical Engineering, of one hundred eighty-two volumes principally relating to aeronautics and mechanical engineering.

Mrs. Herbert Dabney, who a year ago presented a most useful collection of works of general literature, particularly travel books, gave us this year ninety-five similar volumes, a gift particularly welcome in our Library.

Other noteworthy gifts were:

Yale University Press: sixty-two volumes of their own publications in political science, distributed as a memorial to William Howard Taft and Arthur Twining Hadley.

Dr. H. M. Goodwin: Files of the publications of the United States Bureau of Standards, and astronomical publications.

The Earl of Camperdown: The publications of the Institution of Civil Engineers, the Junior Institution of Engineers, and the Iron and Steel Institute.

The Hindustan Club: fifteen volumes on India.

Various periodicals and society publications were presented regularly, as in previous years, by President Stratton and by Professors Bigelow, Dewey, Gill, Hutchinson, Locke, S. C. Prescott, Richards, Schell Shimer, Thompson, and Waterhouse, and former Professor Kennelly.

The following members of the Instructing Staff presented the Library with copies of their own works:

Professor C. R. Hayward: An outline of metallurgical practice.
Professor G. L. Hosmer: Geodesy. Second edition.
Professor W. Hovgaard: Twenty-eight papers.
Professor E. H. Huntress: A brief introduction to the use of Beilstein's Handbuch der organischen Chemie.
Professor F. A. Magoun: The frigate *Constitution* and other historic ships.
Professor F. A. Magoun: Sky high. (In collaboration with E. F. Hodgins '22).
Professor C. Terzaghi: Ingenieurgeology: Sonderdruck aus Ingenieurgeologie von Redlich, Terzaghi u. Kampe.
Professor W. H. Timbie and V. Bush: Principles of electrical engineering. Second edition.

Professor J. L. Tryon: Report of his tour among educational institutions of the South and West.
Professor C. E. Turner: Home nursing and child care. (In collaboration with N. J. Morgan and G. B. Collins.)
Professor C. E. Turner: In training for health. (In collaboration with J. M. Pinckney.)
Professor C. E. Turner: Physiology and health.

Other gifts were received also from members of the Instructing Staff and from alumni and undergraduates, including the boards of the undergraduate publications.

The Registrar. The registration increased for the third successive year, and passed the three thousand mark. This is not an inflated growth, as was true immediately after the war, but is a gradual, healthy increase which will probably continue for a few years.

The Freshman class numbered six hundred and ninety-three, and indications point to a Freshman class of considerably over seven hundred for next year. Again, there was a large demand for Aeronautical Engineering, one hundred and forty-eight of the Freshmen trying for the thirty-five places in the second year class. The proportion of Freshmen admitted with clear records has been larger the last three years.

The number of Graduate students was four hundred and forty-five and it is anticipated that the number of students pursuing Graduate work will continue to increase.

Due to the larger Freshman classes of the last few years, it is probable that the total registration will increase again next year and will be about three thousand, two hundred.

The statistics for the year 1929–30 follow:

The Corps of Instructors
(November 1)

	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23	'24	'25	'26	'27	'28	'29
Professors: Emeriti	3	3	3	4	4	4	5	5	5	6	5	8	8	7	7	6	6	4	4
Retired	3	3	3	4	5	7	7	6	6	6	7	6	5	5	7	5	4	3	4
Non-Resident	3	3	3	3	3	2	2	2	2	2	2	2	3	3	3	3	3	4	6
Research (Not counted elsewhere)	4	3	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	13	12	10	12	12	13	14	13	13	14	14	16	16	15	17	14	13	11	14
Professors	40	47	46	59	63	61	59	58	52	56	56	56	61	64	63	68	73	82	81
Associate Professors	17	16	23	23	23	30	32	29	33	34	35	40	43	42	49	55	58	61	59
Assistant Professors	33	35	33	36	31	36	38	33	39	49	54	48	46	51	53	51	58	64	71
Ex-Officio members of Faculty	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Instructors (Members of Faculty)	—	—	—	—	—	—	—	—	—	—	25	30	25	17	14	11	10	8	7
Active Faculty	90	98	102	118	117	127	129	120	124	139	170	174	175	174	179	185	199	215	220
Instructors (Not members of Faculty)	64	67	74	70	79	90	70	67	99	109	84	80	92	98	112	116	115	119	116
Assistants	50	49	54	52	58	54	38	35	39	79	93	87	60	59	53	63	55	53	68
Faculty, Instructors and Assistants	204	214	230	240	254	271	237	222	262	327	347	341	327	331	334	364	369	387	404
Research Associates	5	3	1	3	3	5	4	1	8	19	19	19	25	26	21	24	29	22	21
Research Assistants	6	7	8	15	11	14	7	5	10	15	13	16	17	21	29	38	39	49	58
Lecturers	25	16	19	23	28	31	29	13	13	14	15	15	6	16	21	23	30	29	32
Total Active Members	240	240	258	281	296	321	277	241	293	375	394	391	375	394	415	449	467	487	515

Registration Since the Foundation of the Institute
(As of November 1)

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

Classification of Students by Courses and Years (As of November 1)

Course Name and Number	1927–28						1928–29						1929–30					
	YEAR						YEAR						YEAR					
	1	2	3	4	G	Total	1	2	3	4	G	Total	1	2	3	4	G	Total
Aeronautical Engineering XVI	60	45	38	12	15	170	93	36	37	31	27	224	148	34	35	31	30	278
Architectural Engineering IV-A	17	18	35	20	—	90	22	15	16	28	3	84	16	21	16	14	6	73
Architecture IV	42	56	50	32	9	189	54	45	61	47	11	218	48	55	40	77	8	228
Army Ordnance	—	—	—	10	—	10	—	—	—	9	—	9	—	—	—	11	—	11
Biology and Public Health VII	4	14	12	13	8	51	10	14	15	16	13	68	10	19	30	16	18	93
Building Construction XVII	20	25	21	—	—	66	25	27	24	14	—	90	23	29	23	27	—	102
Chemical Engineering X	61	63	54	49	31	258	60	60	59	43	39	261	89	66	59	43	64	321
Chemical Engineering Practice X-A, X-B	—	—	—	6	36	42	—	—	—	11	46	57	—	—	—	12	51	63
Chemistry V	13	20	19	16	40	108	26	23	16	17	41	123	15	24	16	14	49	118
Civil Engineering I	63	38	45	63	24	233	67	54	49	48	25	243	42	42	57	47	26	214
Electrical Engineering VI	75	48	70	77	81	351	70	44	49	73	63	299	57	42	60	54	65	278
Electrical Engineering VI-A	51	41	39	44	28	203	45	59	35	32	43	214	53	49	44	31	29	206
Electrochemical Engineering XIV	16	10	11	13	5	55	18	11	6	11	4	50	12	12	6	10	7	47
Engineering Administration XV	61	86	76	83	1	307	68	80	76	72	7	303	63	90	72	71	3	299
Fuel and Gas Engineering	—	—	—	—	14	14	—	—	—	—	13	13	—	—	—	—	7	7
General Engineering IX-B	5	4	9	14	—	32	6	6	4	14	—	30	6	10	9	12	—	37
General Science IX-A	2	4	2	2	—	10	3	1	2	5	—	11	2	6	3	2	—	13
Geology XII	1	1	2	2	8	14	5	2	3	5	11	26	2	6	3	5	8	24
Mathematics IX-C	3	—	6	3	6	18	4	4	1	5	5	19	3	7	5	1	8	24
Mechanical Engineering II	66	58	64	77	32	297	47	87	57	60	32	283	64	78	78	55	28	303
Metallurgy $III_{3,4}$	3	1	8	9	6	27	3	—	2	7	6	18	7	9	3	3	12	34
Mining Engineering $III_{1,2}$	6	7	2	7	2	24	9	11	8	4	1	33	3	11	10	8	1	33
Naval Architecture and Marine Engineering XIII	15	7	11	5	1	39	17	18	13	6	1	55	9	19	18	9	1	56
Naval Construction XIII-A	—	—	—	6	9	15	—	—	—	6	6	12	—	—	—	8	6	14
Physics VIII	5	11	10	3	18	47	6	8	10	7	13	44	10	20	10	13	16	69
Railroad Operation I-A	—	—	—	—	—	—	7	7	3	—	—	17	9	7	7	3	—	26
Sanitary Engineering XI	3	2	6	6	—	17	3	3	6	5	2	19	2	5	1	4	2	14
Unclassified	—	—	—	—	—	25	—	—	—	—	—	45	—	—	—	—	—	81
Totals	592	559	590	572	374	2,712	668	615	552	576	412	2,868	693	661	605	581	445	3,066

Classification by Courses of Students Since 1921

	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30
Engineering Courses . . . . . *Total*	3,069	2,767	2,599	2,548	2,423	2,253	2,240	2,305	2,405
Aeronautical Engineering XVI	10	15	12	14	15	72	170	224	278
Architectural Engineering IV-A	54	38	67	68	92	110	90	84	73
Building Construction XVII	—	—	—	—	—	—	66	90	102
Chemical Engineering X, X-A, X-B	492	430	370	313	294	286	300	318	384
Civil Engineering I, I-A	312	319	326	322	298	273	233	260	240
Electrical Engineering VI, VI-A, VI-C	657	658	627	676	711	622	554	513	484
Electrochemical Engineering XIV	98	74	79	61	58	50	55	50	47
Engineering Administration XV	572	484	417	421	365	334	307	303	299
Fuel and Gas Engineering	—	—	—	—	3	8	14	13	7
General Engineering IX-B	47	75	115	99	81	44	32	30	37
Mechanical Engineering II	580	471	417	397	365	329	297	283	303
Military Engineering	—	—	—	—	—	1	—	—	—
Mining Engineering and Metallurgy III	121	94	85	96	68	57	51	51	67
Naval Architecture and Marine Engineering XIII	78	59	46	40	39	35	39	55	56
Naval Construction (Grad. U. S. N. A.) XIII-A	32	41	12	12	19	15	15	12	14
Naval Construction (Not Grad. U. S. N. A.) XIII-A Sp.	—	—	17	17	—	—	—	—	—
Sanitary Engineering XI	16	9	9	12	15	17	17	19	14
Science Courses . . . . . *Total*	208	231	226	220	219	227	248	291	341
Biology and Public Health VII	30	26	34	32	41	36	51	68	93
Chemistry V	106	128	130	127	110	122	108	123	118
General Science IX-A	8	11	13	10	10	6	10	11	13
Geology XII	22	20	17	20	21	15	14	26	24
Mathematics IX-C	1	8	10	10	13	17	18	19	24
Physics VIII	41	38	22	21	24	31	47	44	69
Architecture IV . . . . . *Total*	87	117	88	126	133	150	189	218	228
Army Ordnance . . . . . *Total*	26	25	18	12	9	8	10	9	11
School of Public Health . . . . . *Total*	20	—	—	—	—	—	—	—	—
Unclassified . . . . . *Total*	95	40	18	32	29	33	25	45	81
Grand Total	3,505	3,180	2,949	2,938	2,813	2,671	2,712	2,868	3,066

Geographical Classification of Students, 1929

United States

North Atlantic — Total	2,241
Connecticut	89
Maine	45
Massachusetts	1,540
New Hampshire	36
New Jersey	105
New York	285
Pennsylvania	100
Rhode Island	25
Vermont	16
South Atlantic — Total	146
Delaware	8
District of Columbia	51
Florida	10
Georgia	6
Maryland	22
North Carolina	11
South Carolina	9
Virginia	23
West Virginia	6
South Central — Total	85
Alabama	8
Arkansas	4
Kentucky	15
Louisiana	12
Mississippi	4
Tennessee	9
Texas	33
North Central — Total	290
Illinois	86
Indiana	15
Iowa	10
Kansas	9
Michigan	35
Minnesota	13
Missouri	42
Nebraska	8
North Dakota	4
Ohio	53
South Dakota	—
Wisconsin	15
Western — Total	98
Arizona	5
California	27
Colorado	15
Idaho	2
Montana	9
Nevada	—
New Mexico	3
Oklahoma	5
Oregon	8
Utah	4
Washington	18
Wyoming	2
Territories and Dependencies — Total	19
Alaska	1
Canal Zone	—
Hawaii	4
Philippine Islands	7
Porto Rico	6
Virgin Islands	1
Foreign Countries	187
Grand Total	3,066

List of American Colleges and Universities, with Number of Graduates Attending the Institute 1929–1930

College		College		College	
Alabama Polytechnic Inst.	2	Holy Cross	1	St. Olaf	1
Albion	1	Houghton	1	Shurtleff	1
Alfred	1	Illinois	8	Simmons	2
Allegheny	1	Iowa State	2	Simpson	1
Amherst	5	Iowa University	1	Smith	2
Arizona	1	Jamestown	1	South Carolina	1
Arkansas	1	Johns Hopkins	1	Stanford	7
Assumption	1	Kansas State Agricultural	4	Stetson	1
Aurora	1	Kentucky	4	Stevens Inst. of Tech.	2
Barnard	1	Kenyon	2	Swarthmore	2
Bates	3	Lafayette	1	Syracuse	1
Baylor	1	Lehigh	1	Tennessee	1
Boston College	2	Lincoln	1	Texas	5
Boston University	6	Louisiana State	2	Texas Agricultural and Mech.	1
Bowdoin	2	Louisville	1	Tufts	6
Brigham-Young	2	Lowell Textile Inst.	1	Tulane	1
Brooklyn Polytechnic Inst.	2	Loyola	1	Union	3
Brown	3	Maine	3	U. S. Military Academy	12
Bryn-Mawr	1	Maryland	2	U. S. Naval Academy	23
Bucknell	1	Massachusetts Agricultural	20	University of the South	1
Buffalo	1	Mass. Inst. of Tech.	108	Vanderbilt	1
Butler	2	Michigan	6	Vassar	4
California	3	Michigan College of Mines	2	Virginia Military Inst.	6
California Inst. of Tech.	2	Michigan State	2	Virginia Polytechnic Inst.	2
Canisius	1	Middlebury	2	Wake Forest	1
Carleton	1	Minnesota	5	Washburn	1
Carnegie Inst. of Tech.	1	Missouri	3	Washington	3
Carson-Newman	1	Monmouth	1	Washington and Jefferson	1
Case School of App. Sci.	2	Montana	1	Washington and Lee	3
Central Missouri State Teachers	1	Montana School of Mines	1	Washington State	1
Chattanooga	1	Nebraska	2	Wellesley	8
Chicago	2	Nevada	2	Wesleyan	1
Cincinnati	1	New Mexico	1	West Virginia	1
City of New York	4	North Carolina	5	Wheaton	1
Clemson Agricultural	1	North Dakota Agricultural	1	Whitman	1
Coe	1	Northeastern	9	Williamette	1
Colby	2	Northwestern	1	William Jewell	2
Colgate	4	Notre Dame	3	Williams	9
Colorado School of Mines	2	Oberlin	1	Wilson	1
Colorado University	3	Ohio State	2	Wisconsin	1
Columbia	3	Ohio Wesleyan	4	Wittenberg	1
Connecticut Agricultural	2	Oklahoma	2	Worcester Polytechnic Inst.	6
Cornell University	5	Oregon	1	Yale	15
Dartmouth	11	Penn College	1		
Dayton	1	Pennsylvania Military	1	Total	535
Delaware	1	Pennsylvania State	3		
DePauw	2	Pennsylvania University	4		
Drexel Institute	2	Pittsburgh	1	No. of American Colleges Represented	170
Duke	1	Princeton	1		
Earlham	1	Providence	1	No. of Foreign Colleges Represented (Not listed)	46
Emmanuel	2	Purdue	2		
Emory and Henry	1	Radcliffe	1	Total	216
Florida	1	Randolph-Macon	4		
Framingham Normal	1	Reed	3		
Franklin and Marshall	1	Regis	1		
Furman	3	Rensselaer Polytechnic Inst.	1	No. of College Graduates Registered for Advanced Degrees	426
Georgetown	3	Rice Institute	1		
George Washington	1	Richmond	1	No. of College Graduates Registered for Bachelor's Degree	156
Georgia School of Tech.	3	Roanoke	2		
Gooding	1	Rochester	2		
Hamilton	1	Rose Polytechnic Inst.	1	Total	582
Harvard	11	Rutgers	1		
Haverford	1	St. Joseph	1		
		St. Lawrence	1		

Summary of Degrees Awarded

	Total
Bachelor of Science	12,879
Master of Science	1,945
Master in Architecture	63
Doctor of Engineering (Discontinued after 1918)	4
Doctor of Public Health	4
Doctor of Science	78
Doctor of Philosophy	127
Grand Total	15,100

TABLE 14

NUMBER OF DEGREES AWARDED IN DECEMBER, 1929 AND JUNE, 1930

Name of Course	S.B.		S.M.		M.Arch.		Ph.D.		Sc.D.		Dr.P.H.		Totals	
	Dec.	June	Dec.	June	Dec.	June	Dec.	June	Dec.	June	Dec.	June	Dec.	June
Aeronautical Engineering	5	24	1	3	—	—	—	—	—	—	—	—	6	27
Architectural Engineering	1	14	—	4	—	—	—	—	—	—	—	—	1	18
Architecture	6	39	—	—	—	7	—	—	—	—	—	—	6	46
Biology and Public Health	—	4	—	—	—	—	—	—	—	—	—	1	—	5
Building Construction	1	22	—	—	—	—	—	—	—	—	—	—	1	22
Civil Engineering	7	37	—	8	—	—	—	—	—	—	—	—	7	45
Chemical Engineering	9	34	—	3	—	—	—	—	—	9	—	—	9	46
Chemical Engineering Practice	—	12	2	22	—	—	—	—	—	—	—	—	2	34
Chemistry	—	10	—	5	—	—	1	4	—	—	—	—	1	19
Electrical Engineering (Inc. VI-A)	14	68	7	47	—	—	—	—	—	6	—	—	21	121
Electrochemical Engineering	—	7	—	5	—	—	—	—	—	—	—	—	—	12
Engineering Administration	5	56	—	1	—	—	—	—	—	—	—	—	5	57
Fuel and Gas Engineering	—	—	—	2	—	—	—	—	—	—	—	—	—	2
Geology	—	1	—	—	—	—	—	2	—	—	—	—	—	3
General Engineering	3	6	—	—	—	—	—	—	—	—	—	—	3	6
General Science	—	1	—	—	—	—	—	—	—	—	—	—	—	1
Industrial Biology	—	4	—	—	—	—	—	—	—	—	—	—	—	4
Mathematics	—	1	—	2	—	—	—	3	—	1	—	—	—	7
Mechanical Engineering	12	44	3	5	—	—	—	—	—	2	—	—	15	51
Mining Engineering	3	4	—	—	—	—	—	—	—	—	—	—	3	4
Metallurgy	2	1	—	3	—	—	—	—	—	1	—	—	2	5
Naval Architecture and Marine Engineering	2	5	—	1	—	—	—	—	—	—	—	—	2	6
Naval Construction	—	—	—	5	—	—	—	—	—	—	—	—	—	5
Physics	1	9	—	1	—	—	—	—	—	—	—	—	1	10
Sanitary and Municipal Engineering	—	3	—	—	—	—	—	—	—	—	—	—	—	3
Without Course Classification	—	—	5	46	—	—	—	—	—	—	—	—	5	46
Totals	71	406	18	163	—	7	1	9	—	19	—	1	90	605

The Treasurer

The statements submitted herewith show the financial condition of the Massachusetts Institute of Technology as of June 30, 1930, 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:

Coffin Memorial Fund, for Student Aid	$36,018.50	
Charles Hayden for Dormitories	50,000.00	
Estate of C. W. Goodale, for Dormitories	50,000.00	
Alumni Dormitory Fund Payments	8,541.50	
Estate of Ida F. Estabrook, for Plant	320.00	
Frances and William Emerson, for Student Aid	100,000.00	
Henrietta G. Fitz Fund, for Endowment	10,000.00	
Alexis H. French Fund, for Endowment	5,000.00	
J. A. Grimmons, Perpetual Loan Scholarship	215.76	
James H. Haste Fund, for Student Aid	141,845.63	
Contributions to Industrial Fund	16,950.00	
Wilfred Lewis Fellowship in Mechanical Engineering	5,000.00	
Thomas McCammon Fund, for Endowment	15,000.00	
Susan Minns Fund, for Hydraulics	40,000.00	
Mrs. F. J. Moore, for Moore Fellowship Fund	14,200.00	
Proprietors Locks and Canals Scholarship Fund	2,000.00	
Sedgwick Memorial Fund, for Biology	5,778.91	
Ellen Vose Smith Fund, for Endowment	25,000.00	
Textile Research Fund	42,694.10	
Treasurer's Fund	5,000.00	
Theodore N. Vail Fund, additional	157.26	
Class of '98 Loan Fund, additional	645.00	
Horace Herbert Watson Fund, for Endowment	13,497.50	
Class of '04 Prize Fund, additional	10.00	
Educational Endowment Fund, Payments	1,565.00	
		$589,439.16

Miscellaneous Gifts:

L. J. and Mary E. Horowitz, for Course in Building Construction	$11,500.00
William E. Nickerson, for Graduate Scholarship	500.00
General Electric Co., for Courses VI and VIII	20,000.00
Boston and Maine Railroad, for Course I-A	3,000.00
American Tel. & Tel. Co., for Course VI-A	5,000.00
E. I. du Pont de Nemours Co., for Fellowship	750.00
E. I. du Pont de Nemours Co., for Scholarship	400.00
C. P. Dennett, for Student Aid	250.00
H. M. Crane, for Graduate Scholarships	1,000.00
J. E. Aldred, for Hydraulics	6,500.00
J. E. Aldred, for Aldred Lectures	2,500.00
Contributions to President's Freshman Fund	1,000.00
Redfield Proctor, for Graduate Scholarship	1,000.00
A. P. Sloan, for Graduate Scholarships	3,000.00
Gerard Swope, for Swope Fellowships	2,500.00
R. W. Babson, for Course XV Fund	20.00

(*Continued*)

Lammot du Pont, for Boat House	$2,000.00	
Contributions for Tuition	1,400.00	
Eastman Kodak Co. for Biocinema Research	1,488.46	
		$63,808.46
		$653,247.62

Work is now in progress on additional dormitories to house two hundred men. The cost will be defrayed in part from special Alumni subscriptions and in part by appropriations from our general funds. With the completion of these dormitories in September, we have accommodation for six hundred thirty men, or about one-fifth of the total student body.

Current operating income this year was $137,000 more than last year. Of this $92,000 was additional income from students and the balance was income from invested funds.

For some years we have been building up an Endowment Reserve Fund to protect the securities in the General Investment Account from loss and to insure a uniform income return for the funds participating in this account.

During the year the Endowment Reserve Fund has been increased about $956,000 by realized profits on the sale of certain securities. The fund was further increased by $1,740,000 by marking up certain securities from their original cost part way toward the present market. From the Endowment Reserve Fund as it then stood, a distribution of $2,680,000 has been made to all the participating funds in the General Reserve Account, thereby increasing their principal value about 15 per cent.

As a result we shall have a somewhat lower net yield on the principal of our investments, but it will permit us to add other funds to the General Investment Account without injustice to the older funds in the same account.

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

BALANCE SHEET, JUNE 30, 1930

Assets

Investments (as listed below)	$343,852.50
Cash	10,404.20
Total	$354,256.70

Liabilities

Teachers' Annuity Fund (5% salary deduction, plus interest)	$196,403.36
M. I. T. Pension Fund (3% of salary deducted, plus interest)	127,803.67
Reserve Fund (and interest)	23,729.67
Special Reserve for Annuity Payments	6,320.00
Total	$354,256.70

Investments (as above)

10,000	Dominion of Canada	4½%	1936	$9,825.00
10,000	City of Montreal	5%	1936	10,000.00
30,000	City of Montreal	5%	1942	29,750.00
15,000	Gov't. of U. K., G. B. & Ireland	5½%	1937	15,380.00
35,000	Allis Chalmers Mfg. Co.	5%	1937	35,006.00
6,000	American Sugar Refining Co.	6%	1937	6,148.00
15,000	Chicago P. O. Service Bldg.	5½%	1936	15,000.00
10,000	Chile Copper Co.	5%	1947	9,587.50
35,000	Standard Oil Co. of N. Y.	4½%	1951	33,720.00
25,000	Am. Tel. & Tel. Co.	5%	1946	25,868.00
10,000	Cedars Rapids Mfg. & Power Co.	5%	1953	10,000.00
20,000	Detroit Edison Co.	5%	1940	20,164.00
15,000	Mississippi River Power Co.	5%	1951	15,000.00
10,000	Canadian National Railways	4½%	1957	9,775.00
25,000	Canadian Pacific Ry., Eq. Tr.	5%	1944	25,609.00
22,000	Southern Ry. Dev. & Gen. Mtge.	4%	1956	19,580.00
5,000	Chicago & N. W. Ry. Co., Eq. Tr.	5%	1933	5,000.00
5,000	Chicago & N. W. Ry. Co., Eq. Tr.	5%	1937	5,000.00
16,000	Kans. City, Memphis & Birm. R. R.	5%	1934	16,000.00
15,000	Union Pacific R. R.	4½%	1967	14,940.00
7,000	Central Mfg. District 1st Mtge. "B"	5½%	1937	7,000.00
500	(shares) General Electric Special Stock			5,500.00
				$343,852.50

Respectfully submitted,

EVERETT MORSS,
Treasurer.

September 15, 1930.

SCHEDULE A

FINANCIAL RESULT OF OPERATION FOR YEAR ENDED JUNE 30, 1930 COMPARED WITH THE PREVIOUS YEAR

	1928–29	*1929–30*
Current Operating Expense (Schedule C)	$3,830,939.04	$3,905,327.07
Current Operating Income (Schedule B)	3,272,930.82	3,515,220.00
Excess Expense	$558,008.22	$390,107.07
PROFIT AND LOSS		
Net Profit (Schedule S)	1,823.91	743.62
Net Loss	$556,184.31	$389,363.45
Excess Expense of Funds, charged to Funds	560,868.27	366,303.73
Decrease of Current Surplus 1929–30	.....	$23,059.72
Increase of Current Surplus 1928–29 (Schedule S)	$4,683.96	.....

SCHEDULE B
OPERATING INCOME FOR YEAR 1929-1930

	Regular Courses	*Research and Funds*	*Total*
INCOME FROM STUDENTS:			
(*a*) Tuition Fees	$1,201,954.08	.....	.....
Locker Fees	1,632.06	.....	.....
Entrance Examination Fees	4,925.00	.....	.....
Condition Examination Fees	12,005.00	.....	.....
Late Registration Fees	2,307.00	.....	.....
Net Dormitory Income (Schedule C–19)	45,046.35	.....	.....
	$1,267,869.49	.....	$1,267,869.49
INCOME FROM INVESTMENTS:			
Endowments, General Purposes, (Schedule P)	$1,027,436.01	$300,949.60	$1,328,385.61
(*b*) Endowments for Scholarships, applied	67,932.00	.....	67,932.00
Endowments, Designated Purposes (Schedule Q)	186,863.90	119,692.35	306,556.25
(*c*) Net (Schedule Q)	$1,282,231.91	$420,641.95	$1,702,873.86
INCOME FROM NATIONAL GRANTS:			
Federal Aid from Act 1862	$5,534.87	.....	.....
Act 1890	16,666.67	.....	.....
	$22,201.54	.....	$22,201.54
INCOME FROM OTHER SOURCES:			
American Telephone and Telegraph Co., Course VI-A	$5,000.00	.....	.....
General Electric Co., Courses VI, VI-A and VIII	20,000.00	.....	.....
Boston & Maine R. R., Course I-A	3,000.00	.....	.....
Daniel Guggenheim Fund	9,000.00	.....	.....
Horowitz Foundation	11,500.00	.....	.....
W. E. Nickerson Fund	8,104.02	.....	.....
Division of Laboratory Supplies	4,555.99	.....	.....
Trustees H. C. Frick Estate	58,904.69	.....	.....
E. A. Wyeth Fund	21,899.07	.....	.....
Bank Interest	19,662.74	.....	.....
Huntington Hall Rentals	4,022.00	.....	.....
Walker Building, Boston	10,000.00	.....	.....
U. S. N. Torpedo Research	1,665.92	.....	.....
	$177,314.43	.....	$177,314.43
MINOR FUND EARNINGS:			
Total (Schedule R)	.....	$344,960.68	$344,960.68
TOTAL OPERATING INCOME (Schedule A)	$2,749,617.37	$765,602.63	$3,515,220.00

(*a*) STATEMENT OF TUITION FEES AND SCHOLARSHIPS:

Received in Cash for year 1929–1930	$1,032,938.17
Appropriated for Scholarships from Current Income	14,815.00
Received in Cash for Summer Session 1929	154,200.91
	$1,201,954.08
(*b*) Add Appropriation for Scholarships from Funds	67,932.00
Total Tuitions and Scholarships	$1,269,886.08

(*c*) Additional Income offset by Accrued Interest, Expenses, etc. $64,623.78

SCHEDULE C

OPERATING EXPENSE FOR YEAR 1929–1930

	Regular Courses	*Research and Funds*	*Total*
ACADEMIC EXPENSES:			
Salaries of Teachers (C-1)	$1,317,296.55	.....	.....
Wages Accessory to Teaching (C-1)	47,213.46	.....	.....
Wages, Laboratory Service (C-1)	61,119.90	.....	.....
Department Expenses (C-2)	137,415.30	.....	.....
General Library (C-3)	49,698.93	.....	.....
	$1,612,744.14	.....	$1,612,744.14
ADMINISTRATION EXPENSES:			
Salaries, Officers	$73,400.00	.....	.....
Wages, Clerical Staff (C-4)	74,084.42	.....	.....
Printing and Advertising (C-5)	36,248.03	.....	.....
General Expense (C-6)	137,555.15	.....	.....
	$321,287.60	.....	$321,287.60
PLANT OPERATION AND MAINTENANCE:			
Wages, Building Service (C-7)	$119,837.98	.....	.....
Power Plant Operation (C-8)	117,444.42	.....	.....
Fire Insurance (Net)	1,394.70	.....	.....
Repairs and Alterations (C-9)	187,590.30	.....	.....
	$426,267.40	.....	$426,267.40
MISCELLANEOUS EXPENSES:			
Pension and Insurance Plan	$54,958.33	.....	.....
Division of I. C. and Research	17,337.26	.....	.....
Department of Hygiene (C-10)	60,342.66	.....	.....
Summer Camps 1929 (C-11 and C-12)	11,925.09	.....	.....
Athletic Field, Boat House and Launches (C-13)	23,662.89	.....	.....
*Walker Memorial (C-16)	27,810.28	.....	.....
	$196,036.51	.....	$196,036.51
SPECIAL APPROPRIATIONS:			
Total (C–15)	$217,085.06	.....	217,085.06
EXPENSES OF MINOR FUNDS:			
Total, including Salaries (Schedule R)	.....	$469,377.52	$469,377.52
AWARDS (other than Und. Schol.):			
Total (Schedule C-17)	.....	67,148.19	67,148.19
PAYMENTS FROM SPECIAL FUNDS:			
Total (Schedule C-18)	.....	$595,380.65	$595,380.65
TOTAL OPERATING EXPENSE (Schedule A)	$2,773,420.71	$1,131,906.36	$3,905,327.07

* Not including Dining Service (see Schedule C-14).

SCHEDULE C-1

SALARIES OF TEACHERS, WAGES ACCESSORY TO TEACHING AND LABORATORY SERVICE

Department	*Teachers Salaries (Net)*	*Wages Accessory to Teaching (Net)*	*Wages Laboratory Service (Net)*
Summer Session	$93,418.90	.....	.....
Aeronautics	53,725.45	$2,573.67	.....
Architecture	69,635.00	3,420.66	2,469.26
Biology and Public Health	34,875.00	1,336.50	1,768.00
Building Construction	16,233.00	943.00	.....
Chemistry	123,274.71	4,109.00	3,840.00
Chemistry, Res. Lab. of Physical	28,865.64	1,352.00	*.....
Chemical Engineering	34,130.00	1,500.00	1,820.00
Chemical Engineering Prac. School	13,550.00	*.....	.....
Civil Engineering	74,506.43	2,846.00	.....
Division of Laboratory Supplies	.....	.....	17,361.31
Drawing	26,800.00	268.60	.....
Economics	62,400.00	4,378.00	.....
Electrical Engineering	127,867.00	5,250.00	9,824.32
Electrical Engineering Research	3,433.50	*.....	1,783.53
English and History	57,609.00	2,015.03	.....
Fuel and Gas Engineering	16,925.00	1,300.00	630.00
General Eng. and General Science	1,000.00	.....	.....
General Studies	2,700.00	.....	.....
Geology	26,700.00	1,519.00	.....
German	11,200.00	*.....	.....
Humanics	7,000.00	*.....	.....
Lantern Operation	.....	.....	606.50
Mathematics	63,200.00	*.....	.....
Mechanical Engineering	150,622.12	6,213.83	13,246.44
Meteorology	9,915.30	*.....	.....
Military Science	6,680.00	1,275.00	.....
Mining and Metallurgy	52,331.50	2,855.17	4,520.84
Naval Architecture	36,558.00	1,350.00	1,812.70
Physics	103,116.00	2,708.00	1,437.00
Romance Languages	9,025.00	*.....	.....
Totals (Schedule C)	$1,317,296.55	$47,213.46	$61,119.90

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

SCHEDULE C-2
*DEPARTMENT EXPENSES (Net)

Department	*Expense (Net)*	*Overdrafts*
Aeronautics	$5,631.02	.....
Architecture	3,700.00	$595.03
Biology	2,814.79	.....
Building Construction	2,410.05	.....
Chemistry	15,798.63	379.54
Chemistry, Research Laboratory of Physical	2,500.00	143.18
Chemical Engineering	4,100.00	125.42
Chemical Engineering Practice School	14,500.00	151.18
Civil Engineering	1,895.26	.....
Drawing	747.02	.....
Economics	2,000.00	769.17
Economics, Special	600.00	.....
Electrical Engineering	13,706.78	.....
Electrical Engineering, Research and Theses	8,000.00	57.30
English and History	700.00	92.29
Fuel and Gas Engineering (inc. Field Stations)	3,517.31	.....
General Engineering and General Science	651.80	.....
General Studies	200.00	.....
Geology	2,000.00	.....
German	522.89	.....
Humanics	1,104.02	.....
Mathematics	1,391.99	.....
Mechanical Engineering	19,500.00	282.63
Meteorology	2,500.00	731.70
Military Science	1,975.00	.....
Mining and Metallurgy	6,150.00	.....
Naval Architecture	1,343.43	.....
Physics	17,200.00	173.96
Romance Languages	30.70	.....
United States Army and Navy Officers	224.61	.....
	$137,415.30	$3,501.40

(Schedule C) (Schedule D-2)

SCHEDULE C-3
GENERAL LIBRARY

Salaries of Officers	$6,350.01
Wages, Clerical Staff	27,567.52
Expenses	15,781.40
Total (Schedule C)	$49,698.93

* Certain special appropriations not included (see Schedule C-15).

SCHEDULE C-4
WAGES, CLERICAL STAFF, ADMINISTRATION OFFICES

Offices of the President and Dean	$9,181.30
Registrar's Office	27,530.52
Secretary's Office	8,400.95
Bursar's Office	20,961.56
Superintendent's Office	8,010.09
Total (Schedule C)	$74,084.42

SCHEDULE C-5
PRINTING AND ADVERTISING

Printing, Bursar's Office	$846.38
Printing, Registrar's Office	6,504.34
Printing, Offices of President, Dean, Secretary and Superintendent	2,202.52
Advertising in M. I. T. Publications	2,263.34
Bulletins: President's and Treasurer's Reports	419.00
Directory	1,235.00
Summer Session 1930	2,903.00
Course Pamphlets, etc.	944.75
Graduate Study and Research	903.00
Register of Former Students	9,400.72
Examinations and Class Schedules	2,528.00
Maintenance of Catalogue of Former Students	2,932.17
Summer Session Advertising	923.92
Reprints and Binding, Abstracts of Staff Papers	2,241.89
Total (Schedule C)	$36,248.03

SCHEDULE C-6
GENERAL EXPENSE (Net)

Bursar's Office	$5,073.80
Registrar's Office	5,004.20
Superintendent's Office	2,903.51
Fees, Dues, Commissions, etc.	44,511.37
Secretary's Office, Admissions Office, New Student Publicity	2,305.80
Inauguration, Graduation, Receptions, etc.	32,864.34
President's Office	2,186.01
Ice and Ice Water	1,261.75
Dean's Office, Undergraduate Scholarship Committee	1,984.54
Trucking of Mail	1,689.85
News Service	5,936.91
370 Beacon Street	5,457.82
Traveling Expenses	3,979.35
Telephone Service	17,942.49
Moving to Building 31	4,873.30
Miscellaneous	1,908.23
Total	$139,883.27
Less Credits	2,328.12
Total (Schedule C)	$137,555.15

SCHEDULE C-7
WAGES, BUILDING SERVICE

Shop Foremen (net)	$3,255.22
Janitors: Supervisory and Staff	54,236.37
Night Cleaners	19,142.19
Watchmen (including Cambridge Police)	16,942.16
Window Cleaning	6,970.58
Heating and Ventilation	9,645.22
Messengers, Mail, Elevator, Shipper, Stock Room, Matron	9,646.24
Total (Schedule C)	$119,837.98

SCHEDULE C-8
POWER PLANT OPERATION (Net)

Coal		$81,761.03
Water		5,168.10
Supplies		4,916.49
Repairs		14,385.33
Trucking, etc.		824.19
Salaries		29,955.77
Electricity, Rogers Building		3,388.01
Expense, Rogers Building		1,649.58
Total		$142,048.50
Less Transfers and Credits	$24,104.08	
Inventory, Coal (Schedule D-2)	500.00	
		24,604.08
Total (Schedule C)		$117,444.42

SCHEDULE C-9
REPAIRS, ALTERATIONS AND MAINTENANCE

	Supplies and Repairs	*Alterations*	*Total*
Buildings, etc.			
No. 1, 2, 3, 4, 5, 8, 10, 11	$61,676.44	$9,553.94	$71,230.35
Rogers Building, Boston	8,892.12	5,156.23	14,048.38
Buildings No. 30, 31, 33, 35, 46	7,212.54	1,314.83	8,527.37
Miscellaneous Wooden Buildings	2,976.07	.....	2,976.07
President's House	3,313.34	.....	3,313.34
Furniture	4,267.99	.....	4,267.99
Elevators	1,552.78	.....	1,552.78
Water	6,911.64	.....	6,911.64
Gas	2,750.55	.....	2,750.55
Grounds, Court, Tennis Courts	54,301.35	.....	54,301.35
Building Protection	2,122.52	.....	2,122.52
Rubbish	2,020.51	.....	2,020.51
Undistributed (net)	13,567.45	.....	13,567.45
Total (Schedule C)	$171,565.30	$16,025.00	$187,590.30

SCHEDULE C-10
DEPARTMENT OF HYGIENE

Salaries, Medical Director, Assistants and Infirmary Staff		$29,804.01
Additional Medical Services		1,261.58
Physical Training and Coaching		15,587.50
Medical and Other Supplies		2,655.63
Physical Examinations		4,701.98
Nutrition Class		1,000.00
Equipment		806.38
Food Account, Cost	$4,452.36	
Less Income	3,221.67	
		1,230.69
Laundry		1,438.85
Miscellaneous		1,856.04
Total (Schedule C)		$60,342.66

SCHEDULE C-11
CIVIL ENGINEERING SUMMER CAMP (1929)
TECHNOLOGY, MAINE

Income:		
From Students and Staff	$7,980.12	
Miscellaneous	306.25	
Total Income		$8,286.37
Expenses:		
Travelling Expenses	$540.43	
Construction and Repairs	5,418.14	
Caretaker	1,440.00	
Taxes and Insurance	1,490.30	
Administration, Telephone, etc.	629.61	
Wages — Operating	1,949.13	
Provisions and Supplies	4,465.66	
Coal, Wood, Gas and Ice	997.54	
Express and Freight, Laundry	736.13	
Total Expense		17,666.94
Net Expense		$9,380.57

SCHEDULE C-12
MINING ENGINEERING SUMMER CAMP (1929) DOVER, N. J.

Income:		
From Students and Staff	$1,183.25	
Miscellaneous	45.39	
Total Income		$1,228.64
Expenses:		
Travelling Expenses	$162.62	
Repairs and Equipment	1,456.58	
Caretaker, Insurance, Tel., Adm., Light	958.33	
Wages — Operating	475.00	
Provisions and Supplies	720.63	
Total Expense		3,773.16
Net Expense		$2,544.52
Total Expense of Camps (Schedule C)		$11,925.09

SCHEDULE C-13
ATHLETIC FIELD, BOATHOUSE, LAUNCHES

Athletic Field, Maintenance	$14,972.97
Boat House, Maintenance	6,274.36
Launches, Maintenance	2,415.56
Total (Schedule C)	$23,662.89

SCHEDULE C-14
DINING SERVICE (Net)

Inventory, July 1, 1929:		
Utensils	$9,177.98	
Stock	2,971.52	
		$12,149.50
Expenditures:		
Food	$73,065.88	
Salaries	46,347.10	
Light, Heat and Water	6,029.41	
Ice, Refrigeration	240.21	
Laundry	3,363.02	
Dining Room and Kitchen Equipment	3,960.03	
Repairs	2,192.67	
Printing and Advertising	1,106.56	
Administration Expense	1,292.29	
Insurance	694.52	
Dining Service, Reserve Fund (Schedule R)	10,717.00	149,008.69
Total		$161,158.19
Income:		
Coupon Books	$69,444.15	
Less Outstanding Coupons (Schedule D)	255.39	
	$69,188.76	
Cash	80,555.88	
		$149,744.64
Inventory, June 30, 1930		
Utensils	$8,529.08	
Stock	2,884.47	
		11,413.55
Total		$161,158.19

SCHEDULE C-15
SPECIAL APPROPRIATIONS

Graduate Scholarships	$17,000.00
Undergraduate Scholarships	14,815.00
Undergraduate Dues	21,072.50
Journal of Mathematics and Physics	3,000.00
Society of Arts	2,082.73
New Office and Classroom Equipment	11,673.08
Chemicals furnished to Laboratories	7,561.55
Chemicals and Apparatus furnished Students	9,125.11
Employees Group Life Insurance	4,690.72
Research Laboratory of Applied Chemistry	8,500.00
New Fencing No. 682	3,585.89
Grass Planting No. 663	7,323.68
New Road No. 674	7,097.64
Squash Coach	1,000.00
Pipe Tunnel to New Dormitories	24,000.00
New Doors, Building No. 10	1,145.00
Tile work in '93 Dormitory	855.00
Historic Tablets No. 723	500.00
Special Course in Textiles	722.00
Paris Clinic	100.00
Music Fund	500.00
Boat House Equipment	1,000.00
Guggenheim Bronze Bust	500.00
Medical Department for Needy Students	5,000.00
Architectural Library	1,400.00
Research on Pipe Bends No. 688	438.00
Department of Aeronautical Engineering No. 707, 732	2,562.16
Department of Biology — Health Education	500.00
Food and Fisheries Research	1,500.00
Department of Chemical Engineering No. 685	1,500.00
Department of Civil Engineering, Soil Mechanics	300.00
Lecturers	2,500.00
Summer Camp	500.00
Summer Camp	1,200.00
No. 714	1,000.00
No. 757	1,200.00
Department of Electric Engineering No. 678-9	630.00
Communications Laboratory	6,000.00
Round Hill	3,000.00
Intergraph	6,500.00
No. 749	575.00
Department of Engineering Administration No. 739	5,280.00
Department of General Studies No. 719	350.00
Department of Geology No. 727	1,000.00
Department of Mathematics	600.00
Department of Meteorology	1,000.00
Department of Mining and Metallurgy, Camp	6,000.00
No. 730 Cables	3,000.00
No. 731 Room 8-035	5,000.00
No. 709 Cast Iron Res.	1,000.00
Department of Physics No. 687	900.00
No. 699 Ceramics	500.00
No. 712 Ceramics	300.00
No. 726	2,200.00
No. 753	350.00
No. 756	2,000.00
Salaries and Travelling Expenses	750.00
Travelling Fellowships — Hydraulics	1,200.00
Structural Engineering	1,500.00
Total (Schedule C)	$217,085.06

SCHEDULE C-16
WALKER MEMORIAL (Net)

Income:		
Games	$2,495.66	
		$2,495.66
Expenses:		
Salaries	$11,215.10	
Light, Heat, Power	5,105.07	
Water	582.58	
Repairs, Alterations, Maintenance	12,055.82	
Trucking and Administration	831.41	
Supplies	346.76	
Magazines and Papers	169.20	
Total		30,305.94
Net Expense (Schedule C)		$27,810.28

SCHEDULE C-17
AWARDS FROM FUNDS (Other than Undergraduate Scholarships)

Edward Austin Fund for Travelling Fellowship	$1,500.00
Edward Austin Fund for Graduate Scholarships	22,915.20
Teachers' Fund, Retiring Allowances	4,331.00
Robert A. Boit Fund, Prizes	400.00
Roger D. Hunneman Fund, Prizes	50.00
Class of 1904 Prize Fund in Architecture	15.00
Arthur Rotch Prize Funds, Prizes	500.00
William Barton Rogers Fund for Student Loans	8,338.50
Bursar's Fund, for Student Loans	4,328.49
Dean's Fund, for Student Loans	1,355.00
Summer Surveying Camp Fund, for Loans	725.00
Misc. Funds, for Graduate Scholarships and Fellowships	18,390.00
Jonathan Whitney Fund:	
Graduate Scholarships	2,800.00
Technology Christian Association	1,500.00
Total (Schedule C)	$67,148.19

SCHEDULE C-18
PAYMENTS FROM SPECIAL FUNDS

New Dormitory Fund, for Dormitories	$200,000.00
Industrial Fund for Plant Capital	8,892.88
Undergraduate Dues Fund for Class Dues	300.00
Sedgwick Memorial Lecture Fund for Lectures	221.98
Treasurer's Fund for Mural Paintings	10,045.00
Walter S. Barker, for Books	397.59
Frank Harvey Cilley, for Books, etc.	1,095.00
Class Endowment Reserve Funds, for Premium Payments	2,549.97
Charles Lewis Flint, for Books	224.00
William Hall Kerr, for Books	68.32
George A. Osborne, for Books	291.52
M. I. T. Teachers' Insurance, for Premium Payments	21,915.50
John Hume Tod, for Books	127.72
Theodore N. Vail for Vail Library	1,484.30
Ednah Dow Cheney, for Margaret Cheney Room	155.08
Crosby Honorary for Geology	155.50
F. Jewett Moore, for Chemical Department	604.55
F. W. Boles Memorial, for Architecture Department	1,041.30
Edmund K. Turner, for Annuity and Tax	2,033.45
Pratt Naval Architectural, for Annuity and Nautical Museum	12,888.50
John A. Aldred, for Division of Municipal and Industrial Research	16,678 38
Edward D. Peters, for Geology Department	405.91
Samuel Cabot, for Applied Chemistry Research	3,300.00
C. B. Richardson, for Applied Chemistry Research	1,600.00
Crane Automotive Research, for Equipment	5,100.00
Ellen H. Richards, for Research	804.20
Edward Whitney, for Volcanic Research	3,000.00
Eastman Contract, to George Eastman	300,000.00
Total (Schedule C)	$595,380.65

SCHEDULE C-19
DORMITORY OPERATION (Net)

Income:			
From Rentals		$109,088.72	
Less Refunds		6,179.92	
Total			$102,908.80
Expenses:			
Salaries		$26,474.54	
Laundry		3,550.08	
Heat, Light, Power		11,120.90	
Water		1,760.35	
Repairs		3,480.06	
Supplies	$5,735.55		
Less Inventory (June 30, 1930) (Schedule D-2)	3,462.20	2,273.35	
Printing, Administration, Telephone		1,464.04	
New Equipment		239.13	
Interest on Mortgage Loan (Whitney Fund)		7,500.00	
Total			$57,862.45
Net Income (Schedule B)			$45,046.35

SCHEDULE D
TREASURER'S BALANCE SHEET

1

ENDOWMENT ASSETS

Securities and Real Estate (Schedule H)	$32,901,500.31
Cash: For Investment (Schedule D-3)	247,485.07
Total June 30, 1930	$33,148,985.38

2

CURRENT ASSETS

Cash: For General Purposes (Schedule D-3)	$121,326.14
Accounts Receivable (Schedule D-1)	43,972.24
Students' Fees, Receivable	1,649.20
Students' Deposits, Receivable	254.79
Deposit on Fire Insurance Account	44,000.00
Inventories and Advances for 1930–31 (Schedule D-2)	96,574.13
Total June 30, 1930	$307,776.50

3

EDUCATIONAL PLANT ASSETS

Land, Buildings, and Equipment, June 30, 1929	$13,883,044.19
Additions during year (Account, New Dormitories)	126,954.79
Cash for Dormitories (Schedule D-3	73,045.21
Total June 30, 1930 (Schedule J)	$14,083,044.19

SCHEDULE D

JUNE 30, 1930

1

ENDOWMENT FUNDS

Funds (Schedule Q)	$33,148,985.38
Total, June 30, 1930	$33,148,985.38

2

CURRENT LIABILITIES

Minor Funds (Schedule R)	$159,813.65
Accounts Payable	17,626.72
Students' Fees and Deposits Payable (Schedule D-4)	106,915.05
*Undergraduate Dues, Balance	769.73
Dining Room Coupons, Outstanding	255.39
Total	$285,380.54
Surplus, Available for Current Expenses (Schedule S)	22,395.96
Total June 30, 1930	$307,776.50

3

EDUCATIONAL PLANT CAPITAL

Endowment for Educational Plant, June 30, 1929	$13,873,831.31
Appropriated During Year	209,212.88
Total, June 30, 1930 (Schedule K)	$14,083,044.19

*See also Undergraduate Dues Reserve (Schedule Q, p. 57).

SCHEDULE D-1
DETAIL OF ACCOUNTS RECEIVABLE

Division of Industrial Coöperation and Research	$7,853.58
Division of Municipal and Industrial Research	6,400.00
Investment Income (June, 1929)	4,063.75
R. L. A. C. Contracts	13,116.79
Harvard Coöperative Society, Inc. (Notes)	1,421.16
Miscellaneous Accounts	11,116.96
Total (Schedule D)	$43,972.24

SCHEDULE D-2
DETAIL OF INVENTORIES AND ADVANCES FOR 1930–1931

Department Overdrafts (Schedule C-2)	$3,501.40
Summer Session Salaries, Advanced	2,319.31
Civil Engineering Summer Camp 1930, Advanced (Net)	1,935.60
Mining Engineering Summer Camp 1930, Advanced (Net)	23.33
Premiums Paid on Unexpired Insurance	5,329.80
Inventories — Notes held by Coöperative Society and M.I.T.	2,889.25
Dormitory Supplies	3,462.20
Dining Service, Food, Utensils, etc.	11,413.55
Walker Memorial Games, Candy, Cigars, etc.	682.72
Letter Shop Supplies	648.01
Stamps	743.40
Office Supplies	1,871.97
Building and Janitors' Supplies	2,512.47
Architectural Students' Supply Room, Stock	1,316.98
Stock Room: Pipe, Fittings, Lumber, Hardware, Paint, Oil, Glass and Miscellaneous Supplies	14,166.10
Division of Laboratory Supplies: Chemicals, Glassware, Platinum, etc.	43,080.44
Liquid Soap	177.60
Coal	500.00
Total (Schedule D)	$96,574.13

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

Total Cash Receipts	$11,850,028.27
Total Cash Disbursements	11,906,490.39
Excess of Disbursements	$56,462.12
Cash, June 30, 1929	498,318.54
Cash, June 30, 1930	$441,856.42

CASH BALANCE

Cash for Investment — on Deposit (Schedule D)		$247,485.07
Cash for Buildings — on Deposit (Schedule D)		73,045.21
Cash for Current Purposes (Schedule D)		
On Deposit	$119,520.32	
In Office	1,805.82	
		121,326.14
Total Cash (Schedule D)		$441,856.42

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

Tuition Fees, Summer Session 1930	$91,052.00
Students' Deposits Payable	4,322.00
Students' Deposits, Summer Session 1930	3,331.80
Dormitory Deposits in Advance	2,390.00
Dormitory Rentals, Summer Session 1930	5,714.25
Deposits, Mining Engineering Summer Camp 1930	105.00
Total (Schedule D)	$106,915.05

SCHEDULE H

INVESTMENTS, BONDS, STOCKS,

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	GOVERNMENT AND MUNICIPAL BONDS			
$1,000	Cincinnati, City of, Street Imp.. . .	4½%	1933	$1,005.00
500	Cincinnati, City of, Street Imp.. . .	4½%	1935	510.00
1,000	Cincinnati, City of, Street Imp.. . .	4½%	1935	1,028.00
6,500	Cincinnati, City of, Condemnation .	4½%	1945	6,950.00
100,000	Columbus, City of, Water Ext. No. 2	4½%	1944	104,778.00
25,000	German Govt. International Loan. .	5½%	1965	.....
70,000	Great Britain and Ireland	5½%	1937	70,476.00
18,000	Kansas City, Sewer, 2d Issue . . .	4½%	1935	18,425.00
5,000	Kansas City, 23d St. Trafficway . .	4½%	1935	5,117.00
50,000	Los Angeles, City of, Water Works .	4½%	1942	51,533.00
10,000	Los Angeles, City of, Water Works .	4½%	1943	10,239.00
15,000	Los Angeles, City of, Water Works .	4½%	1943	15,362.00
50,000	Maisonneuve, City of (Montreal) . .	5%	1954	49,000.00
5,000	Mass., Comlth. of, Met. Park Loan .	3½%	1936	4,900.00
15,000	Montreal, City of	5%	1936	15,000.00
70,000	Montreal, City of	5%	1942	97,500.00
10,000	New York, City of, Corporate Stock.	4¼%	1964	10,321.00
5,000	New York, City of, Corporate Stock.	4½%	1967	4,625.00
33,000	Norfolk, City of, Va., Appropriation.	4%	1954	33,000.00
50,000	Omaha, City of, Nebraska	4½%	1934	50,942.00
50,000	Omaha, City of, Water Works . . .	4½%	1941	52,177.00
149,000	Ontario, Province of, Debenture . .	4%	1932	146,394.03
50,000	Ontario, Province of, Debenture . .	5½%	1937	50,344.00
50,000	Ontario, Province of, Debenture . .	6%	1943	53,167.00
50,000	Ontario, Province of, Debenture . .	5%	1952	49,250.00
14,000	Ontario, Province of, Debenture . .	5%	1959	13,930.00
1,000	Ottawa, City of, Ontario	4½%	1935	945.00
2,000	Ottawa, City of, Ontario	5%	1930	1,995.00
10,000	Ottawa, City of, Ontario	5%	1945	9,975.00
5,000	Ottawa, City of, Ontario	5%	1947	5,051.00
7,000	Ottawa, City of, Ontario	5½%	1931	7,018.00
42,000	Ottawa, City of, Ontario	5½%	1932	42,210.00
60,000	Ottawa, City of, Ontario	5½%	1939	61,306.00
1,000	Ottawa, City of, Ontario	6%	1931	1,006.00
5,000	Ottawa, City of, Ontario	6%	1936	5,180.00
1,000	Ottawa, City of, Ontario	6%	1938	1,049.00
8,000	Ottawa, City of, Ontario	6%	1939	8,401.00
8,000	Ottawa, City of, Ontario	6%	1940	8,434.00
1,000	Ottawa, City of, Ontario	6%	1948	1,072.00

SCHEDULE H

REAL ESTATE AND MORTGAGES

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	$2.00	$1,003.00	.....	$45.00
.....	3.00	507.00	.....	22.50
.....	5.00	1,023.00	.....	45.00
.....	30.00	6,920.00	.....	292.50
.....	342.00	104,436.00	.....	4,500.00
$22,437.50	.....	22,437.50	$99.31	.....
.....	68.00	70,408.00	.....	3,850.00
.....	86.00	18,339.00	.....	810.00
.....	24.00	5,093.00	.....	225.00
.....	128.00	51,405.00	.....	2,250.00
.....	19.00	10,220.00	.....	450.00
.....	28.00	15,334.00	.....	675.00
.....	.....	49,000.00	.....	2,500.00
.....	.....	4,900.00	.....	175.00
.....	.....	15,000.00	.....	750.00
500.00	29,750.00	68,250.00	.....	4,229.16
.....	10.00	10,311.00	.....	425.00
.....	.....	4,625.00	.....	225.00
.....	.....	33,000.00	.....	1,320.00
.....	237.00	50,705.00	.....	2,250.00
.....	198.00	51,979.00	.....	2,250.00
.....	.....	146,394.03	.....	5,960.00
.....	49.00	50,295.00	.....	2,750.00
.....	244.00	52,923.00	.....	3,000.00
.....	.....	49,250.00	.....	2,500.00
.....	.....	13,930.00	.....	700.00
.....	.....	945.00	.....	45.00
.....	.....	1,995.00	.....	100.00
.....	.....	9,975.00	.....	500.00
.....	3.00	5,048.00	.....	250.00
.....	9.00	7,009.00	.....	385.00
.....	105.00	42,105.00	.....	2,310.00
.....	146.00	61,160.00	.....	3,300.00
.....	3.00	1,003.00	.....	60.00
.....	30.00	5,150.00	.....	300.00
.....	6.00	1,043.00	.....	60.00
.....	45.00	8,356.00	.....	480.00
.....	44.00	8,390.00	.....	480.00
.....	4.00	1,068.00	.....	60.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	GOVERNMENT AND MUNICIPAL BONDS (*Continued*)			
$10,000	Ottawa, City of, Ontario	6%	1951	$10,748.00
50,000	Toronto, City of, Ontario, Gen. Loan	5%	1932	50,000.00
10,000	Toronto, City of, Ontario.	5%	1935	9,845.00
35,000	Toronto, City of, Ontario.	5%	1936	34,475.00
18,000	Toronto, City of, Ontario.	5%	1937	17,721.00
23,000	Toronto, City of, Ontario.	5%	1939	22,655.00
9,000	Toronto, City of, Ontario.	5%	1942	8,830.80
5,000	Toronto, City of, Ontario.	6%	1934	5,096.00
23,000	Toronto, City of, Consolidated Loan	6%	1944	23,933.00
18,000	Toronto, City of, Consolidated Loan	6%	1945	18,767.00
9,000	Toronto, City of, Consolidated Loan	6%	1946	9,399.00
50,000	Winnipeg, City of, Debenture	5%	1943	48,750.00
7,000	Winnipeg, City of, Gr. Water Dist.	5%	1952	6,790.00
25,000	Winnipeg, City of	6%	1946	26,391.00
	Sold or matured during year			516,312.20
$1,346,000	*Total Government and Municipal Bonds*			$1,879,328.03
	INDUSTRIAL BONDS			
$15,000	Allis-Chalmers Mfg. Co., Gold Deb.	5%	1937	$34,562.50
30,000	Am. Agri. Chem. Co., 1st Ref. S. F.	7½%	1941	29,100.00
34,000	American Sugar Ref. Co.	6%	1937	47,680.00
25,000	Armour & Co. of Del., 1st Mtge. "A"	5½%	1943	24,000.00
40,000	Chile Copper Co. Gold	5%	1947	38,580.00
25,000	Fruit Growers Ex. Co., Equip. Tr. "G"	4½%	1934	24,607.25
25,000	Fruit Growers Ex. Co., Equip. Tr. "G"	4½%	1935	24,573.75
100,000	Glidden Co. Gold	5½%	1935	.....
100,000	International Cement Corp.	5%	1948	96,750.00
1,000	Inter. Paper Co., 1st & Ref. Gold "B"	5%	1947	1,000.00
1,300	Phila.& Reading Coal & Iron Ref.Mtg.	5%	1973	1,300.00
50,000	Prudence Co., Inc., Mtg.	5½%	1933	49,875.00
2,700	Reading Co., Gen. & Ref. Mtge. "A"	4½%	1997	2,646.00
110,000	Royal Dutch Co. Deb. "A"	4%	1945	.....
100,000	Shell Union Oil Corp. S. F. Deb.	5%	1949	.....
47,000	Smith & Wesson, Inc., 1st Mtge. S. F.	5½%	1938	47,520.00
100,000	Solvay Am.Inv.Corp.,Sec.Gold Notes	5%	1942	99,500.00
15,000	Standard Oil Co. of N. J.	5%	1946	15,063.00
65,000	Standard Oil Co. of N. Y.	4½%	1951	95,625.00
74,000	Swift & Co., 1st S. F.	5%	1944	69,883.13

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	$36.00	$10,712.00	.....	$600.00
.....	.....	50,000.00	.....	2,500.00
.....	.....	9,845.00	.....	500.00
.....	.....	34,475.00	.....	1,750.00
.....	.....	17,721.00	.....	900.00
.....	.....	22,655.00	.....	1,150.00
.....	.....	8,830.80	.....	450.00
.....	24.00	5,072.00	.....	300.00
.....	67.00	23,866.00	.....	1,380.00
.....	51.00	18,716.00	.....	1,080.00
.....	25.00	9,374.00	.....	540.00
.....	.....	48,750.00	.....	2,500.00
.....	.....	6,790.00	.....	350.00
.....	87.00	26,304.00	.....	1,500.00
.....	516,312.20	.....	$24,535.69	70,977.35
$22,937.50	$548,220.20	$1,354,045.33	$24,635.00	$137,006.51
$250.00	$20,000.00	$14,812.50	.....	$1,250.00
.....	.....	29,100.00	.....	2,250.00
266.89	13,525.89	34,421.00	.....	2,820.00
.....	.....	24,000.00	.....	1,375.00
.....	.....	38,580.00	.....	2,000.00
.....	.....	24,607.25	.....	1,125.00
.....	.....	24,573.75	.....	1,125.00
99,750.00	.....	99,750.00	$137.50	.....
.....	.....	96,750.00	.....	5,000.00
.....	.....	1,000.00	.....	50.00
.....	.....	1,300.00	.....	65.00
.....	.....	49,875.00	.....	2,750.00
.....	.....	2,646.00	.....	121.50
98,175.00	.....	98,175.00	85.56	.....
98,885.00	.....	98,885.00	2,111.10	2,500.00
55.00	1,045.00	46,530.00	.....	2,612.50
.....	.....	99,500.00	.....	5,000.00
.....	4.00	15,059.00	.....	750.00
251.25	33,720.00	62,156.25	.....	3,843.50
.....	.....	69,883.13	.....	3,700.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	INDUSTRIAL BONDS (*Continued*)			
$100,000	Texas Corp. Conv. Deb.	5%	1944	.....
100,000	United Drug Co.	5%	1953	$98,750.00
50,000	Waltham Watch & Clock Co.	6%	1943	49,000.00
5,000	Winchester Repeat. Arms Co., 1st Mtg.	7½%	1941	5,196.00
	Sold or matured during year			399,495. 00
$1,215,000	*Total Industrial Bonds*			$1,254,706.63
	INDUSTRIAL STOCKS	*Div.*	*Shares*	
$12,500	American Can Co., Com.	4%	500	.....
*50,000	American Car & Foundry Co., Com.	6%	500	$50,875.00
13,750	American Pneumatic Serv. Co., 1st Pf.	7%	275	13,750.00
50,000	Amoskeag Mfg. Co., Pref.	4½%	500	41,395.00
50,000	Anaconda Copper Mining Co., Cap.	7%	1,000	28,254.00
16,000	Brill Corporation, Class A	..	160	8,183.00
11,500	Charlton Mills, Capital	8%	115	11,486.04
*50,000	Curtis Publishing Co., Pref.	7%	500	.....
10,000	Devoe & Raynolds Co., Inc., 1st Pref.	7%	100	9,800.00
*	Eastern Mfg. Co., New Common	..	1,000	.....
25,000	Eastern Mfg. Co., Prior Preference	7%	500	15,000.00
*1,250,000	Eastman Kodak Co., Common	8%	12,500	1,000,000.00
*400,000	General Electric Company, Capital	$1.60	4,000	122,287.50
14,710	General Electric Co., Special	60c	1,471	14,850.00
*110,000	Gillette Safety Razor Co.	5%	1,102	78,961.95
49,000	Int. Match Corp., Part. Pref.	4%	1,400	.....
*12,500	Lackawanna Securities Co., Common	4%	125	8,250.00
50,000	Nashua Mfg. Company, Common	..	500	20,000.00
*8,700	Phila. Reading Coal & Iron Corp. Com.	..	87	872.93
*49,200	Pullman Incorporated, Capital	4%	492	36,751.83
*	Quebradas Company	..	2,249	.....
6,500	Queen City Cotton Co., Capital	4%	65	1,300.00
*7,500	Samson Cordage Company	8%	75	5,000.00
100,000	Shell Union Oil Co., Conv. Pfd.	5½	1,000	.....
*66,300	Standard Oil Co. of California, Capital	$2.50	663	29,981.25
16,000	Union Cotton Mfg. Co., Capital	6%	160	8,640.00
*530,500	United Fruit Company, Capital	4%	5,305	212,870.00
50,000	U. S. Steel Corp., Cum. Pref.	7%	500	55,162.50

*No par value.

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
$101,062.50	$75.50	$100,987.00	$1,444.45	$2,500.00
.....	.....	98,750.00	.....	5,000.00
.....	.....	49,000.00	.....	3,000.00
.....	18.00	5,178.00	.....	375.00
.....	399,495.00	.....	.....	10,925.00
$398,695.64	$467,883.39	$1,185,518.88	$3,778.61	$60,137.50
$71,312.50	.....	$71,312.50	.....	$500.00
.....	$25,000.00	25,875.00	.....	3,000.00
.....	.....	13,750.00	.....	962.48
.....	.....	41,395.00	.....	2,250.00
.....	.....	28,254.00	.....	7,000.00
.....	6,400.00	1,783.00	.....	104.00
.....	4,600.00	6,886.04	.....	920.00
59,375.00	.....	59,375.00	.....	.....
.....	.....	9,800.00	.....	700.00
.....	.....	.....	.....	.....
.....	.....	15,000.00	.....	1,750.00
939,700.00	64,700.00	1,875,000.00	.....	100,000.00
799,757.50	762,045.00	160,000.00	.....	10,100.00
.....	.....	14,850.00	.....	882.60
.....	47.50	78,914.45	.....	5,380.00
111.042.50	.....	111,042.50	.....	1,400.00
....	.....	8,250.00	.....	500.00
.....	5,000.00	15,000.00	.....	.....
.....	.....	872.93	.....	.....
.....	.....	36,751.83	.....	1,968.00
.....	.....	.....	.....	2,000.00
.....	.....	1,300.00	.....	260.00
.....	.....	5,000.00	.....	600.00
97,750.00	.....	97,750.00	$137.50	4,125.00
.....	.....	29,981.25	.....	1,641.25
.....	4,800.00	3,840.00	.....	960.00
185,005.00	.....	397,875.00	.....	21,000.00
14,837.50	.....	70,000.00	.....	3,500.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Div.*	*Shares*	*Balance June 30, 1929*
	INDUSTRIAL STOCKS (*Continued*)			
$32,100	Wamsutta Mills, Capital		321	$32,528.00
5,000	Westinghouse Elec. & Mfg. Co., Pref..	5%	100	6,393.90
51,100	Westinghouse Elec. & Mfg. Co., Com.	5%	1,022	45,151.92
	Sold during year			64,817.84
$3,097,860	*Total Industrial Stocks*			$1,922,562.66

PUBLIC UTILITY BONDS

		Rate	*Maturity*	
$62,000	Am. Tel. & Tel. Co., Col. Trust. . .	5%	1946	$60,902.09
50,000	Appalachian Elec.P'r Co.,1st&Ref.Mt.	5%	1956	48,375.00
50,000	Blackstone Valley Gas & El. Co., Mt.	5%	1939	50,096.00
46,000	Boston Elevated Ry. Co..	6%	1933	45,100.00
5,000	Boston Elevated Ry. Co..	4%	1935	4,600.00
100,000	Boston Elevated Ry. Co..	5%	1937	99,875.00
3,300	Brooklyn Union Gas Co., Conv. Deb.	5½%	1936	3,300.00
185,000	Cedars Rapids Mfg.&P.Co.,1stMt.S.F.	5%	1953	172,903.85
25,000	Central Illinois Pub. Ser. Co. . . .	4½%	1931	24,796.25
25,000	Chesa. & Potomac Tel. Co., S.F. "A"	5%	1943	24,500.00
50,000	Chicago City Railway Co., 1st Mtge.	5%	1927	49,750.00
4,500	Chicago Railways Co., 1st Mtge. . .	5%	1927	3,750.00
101,000	Cleveland Elec. Ill. Co., 1st Mtge. .	5%	1939	101,460.00
120,000	Commonwealth Edison Co., 1st Mtg.	5%	1943	119,400.00
46,000	Conn. Lt. & Pr. Co., 1st Mt. S.F. "A"	7%	1951	43,324.48
52,000	Conn. Lt. & Pr. Co., 1st Mtg. "C" .	4½%	1956	49,465.00
150,000	Con. Gas, Elec. Lt. & Power Co., Mtg.	4½%	1935	141,475.00
50,000	Dallas Ry. & Terminal Co., 1st Mtge.	6%	1951	48,125.00
25,000	Detroit Edison Co., 1st Mtge. . . .	5%	1933	25,099.00
131,000	Detroit Edison Co., 1st & Ref.Mt."A"	5%	1940	128,718.93
100,000	Duquesne Lt. & Pr. Co., 1st Mt., Gold	4½%	1967	94,750.00
35,000	East. Mass. St. Ry. Co., Ref. Mt. "A"	4½%	1948	35,000.00
100,000	Edison Elec. Ill. Co. of Boston, Gold .	4½%	1930	100,041.00
175,000	Edison Elec. Ill. Co. of Boston, Gold.	5%	1933	.....
25,000	Em. Gas & El. Co. & Em. Coke Co., Jt.	5%	1941	18,250.00
41,000	Georgia Ry. & El. Co., 1st Cons. Mt..	5%	1932	41,042.00
50,000	Great Lakes Power Co., Ltd., 1st Mt.	6%	1943	43,187.50
50,000	Gulf States Util.Co., 1st&Ref.Mt."A"	5%	1956	46,875.00
163,000	HydraulicPr.Co.of Niag.F'lls,Ref.&Im.	5%	1951	155,095.00
59,000	Illinois Bell Tel. Co., 1st & Ref. "A"	5%	1956	56,712.50
25,000	Indianapolis Water Co., 1st Lien&Ref.	5½%	1953	24,000.00
100,000	Laclede Gas Lt. Co., 1st Mt. Col.&Ref.	5½%	1953	96,122.50

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	$28,890.00	$3,638.00	.....	.....
.....	.....	6,393.90	.....	$450.00
$57,048.08	.....	102,200.00	.....	4,599.00
.....	64,817.84	.....	.....	52.50
$2,335,828.08	$966,300.34	$3,292,090.40	$137.50	$176,604.83
.....	.....	$60,902.09	.....	$3,100.00
.....	.....	48,375.00	.....	2,500.00
.....	$11.00	50,085.00	.....	2,500.00
.....	.....	45,100.00	.....	2,760.00
.....	.....	4,600.00	.....	200.00
.....	.....	99,875.00	.....	5,000.00
.....	.....	3,300.00	.....	181.50
.....	.....	172,903.85	.....	9,250.00
.....	.....	24,796.25	.....	1,125.00
.....	.....	24,500.00	.....	1,250.00
.....	.....	49,750.00	.....	2,500.00
.....	500.00	3,250.00	.....	237.50
.....	52.00	101,408.00	.....	5,050.00
.....	.....	119,400.00	.....	6,000.00
.....	.....	43,324.48	.....	3,220.00
.....	.....	49,465.00	.....	2,340.00
.....	.....	141,475.00	.....	6,750.00
.....	.....	48,125.00	.....	3,000.00
.....	33.00	25,066.00	.....	1,250.00
.....	.....	128,718.93	.....	6,550.00
.....	.....	94,750.00	.....	4,500.00
.....	.....	35,000.00	.....	1,575.00
.....	41.00	100,000.00	.....	4,500.00
$173,093.75	.....	173,093.75	$72.92	.....
.....	.....	18,250.00	.....	1,250.00
.....	21.00	41,021.00	.....	2,050.00
.....	.....	43,187.50	.....	3,000.00
.....	.....	46,875.00	.....	2,500.00
.....	.....	155,095.00	.....	8,150.00
.....	.....	56,712.50	.....	2,950.00
.....	.....	24,000.00	.....	1,375.00
.....	.....	96,122.50	.....	5,500.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	PUBLIC UTILITY BONDS (*Continued*)			
$200,000	Laurentide Pr. Co., Ltd., 1st Mt. S. F.	5%	1946	$190,730.00
100,000	Los Angeles Gas & El. Corp., Ref. "F"	5½%	1943	95,750.00
50,000	Los Angeles Gas & El. Corp., Gen'lMt.	5%	1961	49,125.00
200,000	Louisville Gas & El. Co., 1st & Ref. Mt.	5%	1952	184,546.25
200,000	Massachusetts Gas Co., Consolidated	4½%	1931	192,312.50
200,000	Massachusetts Gas Cos., S. F. Deb .	5%	1955	.....
50,000	Milwaukee El. Ry. & Lt. Co., 1st Mt.	5%	1961	46,125.00
50,000	Minneapolis Gen. Elec. Co., Mtge. .	5%	1934	50,116.00
110,000	Mississippi River Power Co., 1st Mt.	5%	1951	101,039.40
100,000	Montreal Light, Heat & Power Co. .	4½%	1932	93,812.50
50,000	Nevada California Electric Co. . . .	5%	1956	47,750.00
200,000	New Bedford Gas & Edison Lt. Co. .	5%	1933	202,700.00
55,000	New England Tel. & Tel. Co., Deb. .	5%	1932	55,140.00
150,000	NewOrleansPub.Serv.,Inc.,1stRef.Mt.	5%	1952	134,375.00
60,000	New York Telephone Co., 1st Mtge. .	4½%	1939	58,043.36
13,000	New York Pow. & Lt. Corp., 1st Mtge.	4½%	1967	.....
5,000	New York & Queen Gas Co.,1st & G.M.	5%	1934	4,900.00
1,000	Nia., Lock. & Ont. P. Co., 1st&Ref. Mt.	5%	1955	1,000.00
100,000	North Boston Lighting Prop.Co.Notes	5%	1932	99,250.00
50,000	North. States Pr. Co., 1st & Ref. Mt..	5%	1941	45,000.00
100,000	Oklahoma Gas & Electric Co., 1st Mtg.	5%	1950	94,750.00
50,000	Ontario Power Co., 1st Mtge. S. F. .	5%	1943	49,312.50
75,000	Pacific Gas & El. Co., 1st Ref. Mt. "B"	6%	1941	77,632.00
75,000	Pacific Tel.&Tel.Co.,1stMt.Col.Tr.S.F.	5%	1937	73,915.10
50,000	Pennsylvania Pr. & Lt. Co., 1stMt."D"	5%	1953	49,250.00
25,000	Portland Gen. Electric Co., 1st Mtge.	5%	1935	25,135.00
97,000	Potomac Elec. Power Co., Mtge. "B"	6%	1953	99,764.00
50,000	Salmon River Power Co., 1st Mtge. .	5%	1952	47,625.00
100,000	Shawinigan Water & Pow.Co.,1st Mtg.	5%	1970	.....
100,000	Southern Bell Tel.&Tel.Co.,1stMt.S.F.	5%	1941	100,657.00
165,000	Southern Calif. Edison Co., Gen. Mtge.	5%	1939	163,218.75
300,000	Texas Power & Light Co., 1st Mtge.	5%	1937	291,437.50
50,000	Virginia Ry. & Pr. Co., 1st Mtge. .	5%	1936	46,375.00
100,000	West Penn. Power Co., 1st Mtge. "E"	5%	1963	93,482.50
50,000	West Penn. Power Co., 1st Mtge. .	5½%	1953	51,059.00
75,000	Western Tel. & Tel. Co., Col. Tr. . .	5%	1932	75,140.00
75,000	Western Union Tel. Co.	5%	1951	75,232.00
	Sold or matured during year			246,054.83
$5,684,800	*Total Public Utility Bonds*			$5,267,846.29

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$190,730.00	.....	$10,000.00
.....	.....	95,750.00	.....	5,500.00
.....	.....	49,125.00	.....	2,500.00
.....	.....	184,546.25	.....	10,000.00
.....	.....	192,312.50	.....	9,000.00
$195,500.00	.....	195,500.00	$583.33	.....
.....		46,125.00	.....	2,500.00
.....	$29.00	50,087.00	.....	2,500.00
.....	.....	101,039.40	.....	5,500.00
.....	.....	93,812.50	.....	4,500.00
.....	.....	47,750.00	.....	2,500.00
.....	900.00	201,800.00	.....	10,000.00
.....	70.00	55,070.00	.....	2,750.00
.....	.....	134,375.00	.....	7,500.00
.....	.....	58,043.36	.....	2,700.00
12,247.50	.....	12,247.50	64.25	.....
.....	.....	4,900.00	.....	250.00
.....	.....	1,000.00	.....	50.00
.....	.....	99,250.00	.....	5,000.00
.....	.....	45,000.00	.....	2,500.00
.....	.....	94,750.00	.....	5,000.00
.....	.....	49,312.50	.....	2,500.00
.....	239.00	77,393.00	.....	4,500.00
.....	.....	73,915.10	.....	3,750.00
.....	.....	49,250.00	.....	2,500.00
.....	27.00	25,108.00	.....	1,250.00
.....	120.00	99,644.00	.....	5,820.00
.....	.....	47,625.00	.....	2,500.00
101,425.00	36.00	101,389.00	1,343.75	.....
.....	60.00	100,597.00	.....	5,000.00
.....	.....	163,218.75	.....	8,250.00
.....	.....	291,437.50	.....	15,000.00
.....	.....	46,375.00	.....	2,500.00
.....	.....	93,482.50	.....	5,000.00
.....	46.00	51,013.00	.....	2,750.00
.....	70.00	75,070.00	.....	3,750.00
.....	12.00	75,220.00	.....	3,750.00
.....	246,054.83	.....	.....	8,128.75
$482,266.25	$248,321.83	$5,501,790.71	$2,064.25	$269,312.75

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Div.*	*Shares*	*Balance June 30, 1929*
	PUBLIC UTILITY STOCKS			
$332,200	American Tel. & Tel. Co., Capital. .	9%	3,322	$353,448.11
*15,000	Brooklyn Union Gas Co., Capital . .	5%	150	8,587.50
*50,000	Commonwealth & Southern Corp.,Pfd.	6%	500	.....
*100,000	Consolidated Gas Co. of N. Y., Pfd..	5%	2,000	92,950.00
65,000	Electric Bond & Share Co. $5 Pfd. .	5%	650	.....
6,800	Eastern Gas & Fuel Asso., Com.		68	.....
3,400	Eastern Gas & Fuel Asso., Cum. Pref.	6%	34	1,540.00
5,000	Eastern Gas & Fuel Asso., Pr. Pref. .	4½%	50	4,100.00
50,000	Public Service Corp. of N. J., Pref. .	5%	500	.....
50,000	Stone & Webster, Inc., Capital . . .	4%	500	.....
	Sold or matured during year . . .			31,374.96
$677,400	*Total Public Utility Stocks*			$492,000.57

	RAILROAD BONDS	*Rate*	*Maturity*	
$75,000	Atch. Top. & S. F., Cal. & Ariz. Lines	4½%	1962	$73,143.75
100,000	Atch. Top. & Santa Fe, Gen. Mtge. . .	4%	1995	96,470.00
13,000	Atch. Top. & Santa Fe, 20-Yr.	4½%	1948	13,000.00
50,000	Atlantic Coast Line R. R. Co., Gen. Un.	4½%	1964	.....
10,000	Boston & Albany Railroad Improvement	4%	1934	9,450.00
1,000	Boston & Maine Railroad	4½%	1944	850.00
150,000	Boston & Maine R. R., 1st Mt. Gold No. 2	5%	1955	.....
50,000	Boston & Maine R. R., 1st Mtge. "AC"	5%	1967	46,500.00
90,000	Canadian Nat'l Railway Co.	4½%	1957	88,425.00
25,000	Canadian Nat'l Rys. Equip. Tr. "J" .	4½%	1938	24,575.00
27,000	Canadian Pacific Ry. Co., Equip. Tr. .	5%	1944	.....
75,000	Central New England Railways, 1st Mtge.	4%	1961	56,281.25
50,000	Cen. Pacific Ry. Co., Short Line Mtge.	4%	1954	40,918.75
100,000	Ches. & Ohio Ry. Co., Cons'd. 1st Mtge.	5%	1939	103,402.00
51,000	Chicago, Burlington & Quincy, Mtge. .	4%	1958	50,307.00
100,000	Chic., Burl. & Quincy, 1st Ref. Mtge. "B"	4½%	1977	96,750.00
100,000	Chic. J. Rys. & Un. St. Yds. Mt. & Co. Tr. .	4%	1940	94,250.00
75,000	Chic. J. Rys. & Un. St. Yd. Ref. Mt. & Co. Tr.	5%	1940	74,143.75
17,000	C. M. St. P. & Pacific R. R. Co., Gold "A"	5%	1975	10,410.00
68,000	C. M. St. P. & Pac. R.R. Con. Gold "A"	5%	2000	41,640.00
65,000	Chicago Union Station, 1st Mtge. "A".	4½%	1963	65,350.00
100,000	Chicago Union Station, 1st Mtge. "C".	6½%	1963	112,739.00
120,000	Chicago & Northwestern Ry. Co. . .	4½%	1931	120,384.00
100,000	Chic. & N. W. Ry. Co., 20-Yr. Gold . .	4¾%	1949	.....
5,000	Chic. & N.W. Ry. Co., Equip. Tr. of 1922	5%	1931	4,920.60
5,000	Chic. & N.W. Ry. Co., Equip. Tr. of 1922	5%	1932	4,916.10
5,000	Chic. & N.W. Ry. Co., Equip. Tr. of 1922	5%	1934	4,907.10

*No par value.

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
$297,529.28	$69,627.39	$581,350.00	$600.00	$26,424.00
.....	.....	8,587.50	.....	750.00
51,625.00	.....	51,625.00	.....	.....
102,025.00	.....	194,975.00	.....	5,625.00
59,312.50	.....	59,312.50	483.33	.....
.....	.....	.....	.....	.....
1,420.13	.....	2,960.13	.....	183.71
.....	.....	4,100.00	.....	173.47
49,350.00	.....	49,350.00	.....	.....
27,940.22	259.48	27,680.74	.....	814.00
.....	31,374.96	.....	.....	.....
$589,202.13	$101,261.83	$979,940.87	$1,083.33	$33,970.18
.....	.....	$73,143.75	.....	$3,375.00
.....	.....	96,470.00	.....	4,000.00
.....	.....	13,000.00	.....	585.00
$48,875.00	.....	48,875.00	$478.13	1,125.00
.....	.....	9,450.00	.....	400.00
.....	.....	850.00	.....	45.00
150,750.00	$30.00	150,720.00	.....	6.94
.....	.....	46,500.00	.....	2,500.00
.....	.....	88,425.00	.....	4,050.00
.....	.....	24,575.00	.....	1,125.00
53,263.75	25,699.75	27,564.00	339.17	250.00
.....	.....	56,281.25	.....	3,000.00
.....	.....	40,918.75	.....	2,000.00
.....	378.00	103,024.00	.....	5,000.00
.....	.....	50,307.00	.....	2,040.00
.....	.....	96,750.00	.....	4,500.00
.....	.....	94,250.00	.....	4,000.00
.....	.....	74,143.75	.....	3,750.00
.....	.....	10,410.00	.....	850.00
.....	.....	41,640.00	.....	3,400.00
.....	11.00	65,339.00	.....	2,925.00
.....	386.00	112,353.00	.....	6,500.00
.....	384.00	120,000.00	.....	5,400.00
100,345.00	18.00	100,327.00	1,312.07	2,375.00
.....	.....	4,920.60	.....	250.00
.....	.....	4,916.10	.....	250.00
.....	.....	4,907.10	.....	250.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	RAILROAD BONDS (*Continued*)			
$5,000	Chic. & N.W. Ry. Co., Equip. Tr. of 1922	5%	1935	$4,902.90
5,000	Chic. & N.W. Ry. Co., Equip. Tr. of 1922	5%	1936	4,899.30
200,000	Chic. & N.W. Ry. Co., 1st & Ref. Mtge.	4½%	2037	189,500.00
100,000	Cleveland Union Terminals Co., 1st Mtg.	4½%	1977	.....
25,000	Cleveland & Pittsburg R. R. Co., Mtge.	4½%	1942	25,354.00
190,000	Delaware & Hudson Co., 1st & Ref. Mt.	4%	1943	172,785.00
35,000	Fort St. Union Depot Co., 1st Mtge. .	4½%	1941	34,825.00
100,000	Grand Trunk & West. Ry., Eq. Tr. . .	5%	1942	.....
50,000	Great Northern Railway Co. Gen. Mtge.	4½%	1976	46,273.00
10,000	Illinois Central Equip. Trust "J" . . .	5%	1931	9,825.00
10,000	Illinois Central Equip. Trust "J" . . .	5%	1932	9,825.00
10,000	Illinois Central Equip. Trust "J" . . .	5%	1935	9,825.00
10,000	Illinois Central Equip. Trust "J" . . .	5%	1936	9,825.00
10,000	Illinois Central Equip. Trust "J" . . .	5%	1937	9,825.00
5,000	Illinois Central R. R. Co., Ref. Mtge. .	4%	1955	4,700.00
75,000	Illinois Central R. R. Co., Sec. Gold. .	4%	1952	67,875.00
59,000	Ill. Cen. R. R. Co., Wes. Lines Mtge. .	4%	1951	54,526.25
9,000	Ill.Cen.R.R.Co., West.Lines Mt.(Reg.)	4%	1951	8,291.25
50,000	Indianapolis Un. Ry. Co., Gen. Mtge. .	5%	1965	49,468.75
8,500	Kan. City, Mem. & Birm. R. R. Co., Mt.	4%	1934	8,287.50
37,000	Kan.City, Mem.&Birm.R.R.Co.,In.Mt.	5%	1934	34,225.00
75,000	Kansas City Terminal Co., 1st Mtge. .	4%	1960	65,437.50
90,000	Lake Shore & Michigan South R. R. Co.	4%	1931	88,950.00
50,000	Long Island R. R. Co., Unified Mtge. .	4%	1949	48,068.75
50,000	Long Island R. R. Co., Un. Mtge. (Reg.)	4%	1949	48,068.75
75,000	Maine Central R. R. Co., 1st Mtge. .	4½%	1935	75,025.00
100,000	Minn., St. Paul & S. St. Marie Ry. Co.	4%	1938	93,425.00
10,000	Minn.,St.Paul & S.St.Marie Ry.Co.Gold	5½%	1949	7,438.10
21,000	Miss. & Ill. Bridge & Belt R. R. Co., Mt.	4%	1951	13,650.00
100,000	Morris & Essex Ry. Co., Constr. "B" .	4½%	1955	.....
10,000	New London Northern R. R. Co., 1st Mt.	4%	1940	8,600.00
41,000	N. Y. C. & H. R. R. R.	4%	1934	39,825.00
42,000	New York Central Lines Equip. Trust .	4½%	1930	40,702.79
15,000	New York Central Lines Equip. Trust .	4½%	1932	14,439.21
14,000	New York Central Lines Equip. Trust .	4½%	1933	13,434.36
9,000	New York Central Lines Equip. Trust .	4½%	1937	8,536.50
18,000	New York Central R. R., Equip. Trust.	7%	1932	18,518.00
6,000	New York Central R. R., Equip. Trust.	7%	1933	6,252.00
11,000	New York Central R. R., Equip. Trust.	7%	1934	11,600.00
25,000	New York Central R. R., Equip. Trust.	4½%	1936	24,702.50
52,000	New York Cen. R.R. Co., Cons. Mt. "A"	4%	1998	46,046.65
100,000	N. Y., Chic.& St. Louis R.R.Co.,Gold"G"	4½%	1978	.....

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$4,902.90	.....	$250.00
.....	.....	4,899.30	.....	250.00
.....	.....	189,500.00	.....	9,000.00
$98,562.50	.....	98,562.50	$337.00	.....
.....	$30.00	25,324.00	.....	1,125.00
.....	.....	172,785.00	.....	7,600.00
.....	.....	34,825.00	.....	1,575.00
99,495.70	.....	99,495.70	2,097.22	2,500.00
.....	.....	46,273.00	.....	2,250.00
.....	.....	9,825.00	.....	500.00
.....	.....	9,825.00	.....	500.00
.....	.....	9,825.00	.....	500.00
.....	.....	9,825.00	.....	500.00
.....	.....	9,825.00	.....	500.00
.....	.....	4,700.00	.....	200.00
.....	.....	67,875.00	.....	3,000.00
.....	.....	54,526.25	.....	2,360.00
.....	.....	8,291.25	.....	360.00
.....	.....	49,468.75	.....	2,500.00
.....	.....	8,287.50	.....	340.00
.....	.....	34,225.00	.....	1,850.00
.....	.....	65,437.50	.....	3,000.00
.....	.....	88,950.00	.....	3,600.00
.....	.....	48,068.75	.....	2,000.00
.....	.....	48,068.75	.....	2,000.00
.....	5.00	75,020.00	.....	3,375.00
.....	.....	93,425.00	.....	4,000.00
.....	.....	7,438.10	.....	550.00
.....	.....	13,650.00	.....	840.00
96,250.00	.....	96,250.00	1,451.26	2,250.00
.....	.....	8,600.00	.....	400.00
.....	.....	39,825.00	.....	1,640.00
.....	.....	40,702.79	.....	1,890.00
.....	.....	14,439.21	.....	675.00
.....	.....	13,434.36	.....	630.00
.....	.....	8,536.50	.....	405.00
.....	259.00	18,259.00	.....	1,260.00
.....	84.00	6,168.00	.....	420.00
.....	150.00	11,450.00	.....	770.00
.....	.....	24,702.50	.....	1,125.00
.....	.....	46,046.65	.....	2,080.00
97,000.00	.....	97,000.00	687.75	.....

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	RAILROAD BONDS (*Continued*)			
$100,000	New York Connect. R. R., 1st Mtge.	4½%	1953	$98,625.00
31,200	N.Y., N.H. & H. Co., Con. Deb. (Reg.)	6%	1948	33,338.00
8,000	N. Y., N. H. & H. R. R. Co., Deb.	4%	1955	6,320.00
75,000	No. Pacific R. R. Co., Prior Lien Ry.	4%	1997	67,875.00
332,000	No. Pacific Ry. Co., Ref. & Imp.	6%	2047	353,468.00
84,000	Oregon R. R. & Nav. Co., Cons. Mtge.	4%	1946	82,668.25
14,500	Oregon Short Line R. R., Cons. Mtge.	5%	1946	14,970.00
18,000	Pennsylvania R. R. Co., Cons. Mtge.	4½%	1960	18,450.00
5,000	Pennsylvania R. R. Co., Equip. Trust	5%	1931	4,961.50
100,000	Pennsylvania R. R. Co., Gen. Mtge.	4½%	1965	100,816.00
150,000	Pere Marquette Ry., 1st Mtge. Gold	4½%	1980	.....
117,900	Pere Marquette Ry., 1st Mtge. "A"	5%	1956	104,719.59
37,500	Pere Marquette Ry. Co., 1st Mtge. "B"	4%	1956	37,500.00
51,000	Rio Grande Western Ry. Co., Mtge.	4%	1939	49,935.00
1,000	Somerset Ry. Co., 1st & Ref. Mtge.	4%	1955	850.00
5,000	Southern Pacific Co. Gold	4%	1949	4,575.00
212,000	Southern Pacific Co.	4½%	1969	192,280.00
20,000	So. Ry. Co., Dev. & Gen. Mtge.	4%	1956	21,242.50
25,000	So.Ry.Co.,St.Louis Div.,1st Mt. (Reg.)	4%	1951	24,875.00
100,000	Southern Pac. Co. Oregon Lines 1st Mtg.	4½%	1977	.....
100,000	Term. R. R. Asso. of St. Louis, Mtge.	4½%	1939	100,154.00
20,000	Union Pacific R. R. Co.	4½%	1967	19,400.00
100,000	Un. Pac. R. R. Co., 1st Mtge. & L. Gr.	4%	1947	100,644.00
10,000	Western Pacific R. R. Co., 1st Mtge. "A"	5%	1946	8,000.00
50,000	Winston Salem South. Ry. Co., Mtge.	4%	1960	43,875.00
	Sold or matured during year			303,820.05
$5,311,600	*Total Railroad Bonds*			$4,454,853.25

	RAILROAD STOCKS	*Div.*	*Shares*	
$33,600	Atchison, Topeka & Santa Fe Co., Pref.	5%	336	$25,200.00
150,000	Atchison, Topeka & Santa Fe Co., Com.	10%	1,500	99,291.55
50,000	Atlanta, Birmingham & Coast R. R., Pfd.	5%	500	50,000.00
40,500	Baltimore & Ohio R. R., Common	7%	405	21,159.33
50,200	Boston & Albany R. R. Co., Capital	8¾%	502	94,883.25
13,300	Chic. Jct. Rwys. & Union St. Yds. Co.	6%	133	12,718.13
20,000	Chicago & Northwestern Ry., Common	5%	200	16,975.00
103,200	Delaware & Hudson R. R., Cap.	9%	1,032	126,604.00
12,500	Del., Lack. & Western R. R.	7%	250	26,800.00
72,500	Great Northern Ry. Co., Preferred	5%	725	62,815.00
8,400	Illinois Central R. R. Pref. "A".	6%	84	8,400.00
44,000	Illinois Central R. R. Co., Capital	7%	440	47,400.00

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$98,625.00	.....	$4,500.00
.....	$119.00	33,219.00	.....	1,872.00
.....	.....	6,320.00	.....	320.00
.....	.....	67,875.00	.....	3,000.00
.....	184.00	353,284.00	.....	19,920.00
.....	.....	82,668.25	.....	3,360.00
.....	30.00	14,940.00	.....	725.00
.....	15.00	18,435.00	.....	810.00
.....	.....	4,961.50	.....	250.00
.....	24.00	100,792.00	.....	4,500.00
$145,185.00	.....	145,185.00	$654.13	.....
.....	.....	104,719.59	.....	5,895.00
.....	.....	37,500.00	.....	1,500.00
.....	.....	49,935.00	.....	2.040.00
.....	.....	850.00	.....	40.00
.....	.....	4,575.00	.....	200.00
.....	.....	192,280.00	.....	9,540.00
15,718.47	19,580.00	17,380.97	252.90	1,446.66
.....	.....	24,875.00	.....	1,000.00
97,250.00	.....	97,250.00	912.50	.....
.....	17.00	100,137.00	.....	4,500.00
.....	.....	19,400.00	.....	900.00
.....	38.00	100,606.00	.....	4,000.00
.....	.....	8,000.00	.....	500.00
.....	.....	43,875.00	.....	2,000.00
.....	303,820.05	.....	.....	14,082.50
$1,002,695.42	$351,261.80	$5,106,286.87	$8,522.13	$221,423.10
.....	.....	$25,200.00	.....	$1,680.00
$170,708.45	.....	270,000.00	.....	11,550.00
.....	.....	50,000.00	.....	2,500.00
11,676.05	$435.38	32,400.00	.....	2,651.25
.....	.....	94,883.25	.....	4,392.50
.....	.....	12,718.13	.....	798.00
.....	.....	16,975.00	.....	1,400.00
.....	.....	126,604.00	.....	9,288.00
.....	.....	26,800.00	.....	1,750.00
.....	.....	62,815.00	.....	3,625.00
.....	.....	8,400.00	.....	504.00
.....	.....	47,400.00	.....	3,080.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Div.*	*Shares*	*Balance June 30, 1929*
	RAILROAD STOCKS (*Continued*)			
$115,000	Louisville & Nashville R. R.	7%	1,150	$99,251.04
17,600	Minn., St. Paul & S. St. Marie Co., Pref.	4%	176	9,680.00
58,000	New York Central R. R. Co., Capital	8%	580	.....
50,000	N. Y., N. H. & H. R. R. Co. Pref.	7%	500	7,800.00
33,500	Norfolk & Western Ry. Co., Common	10%	335	38,860.00
33,000	Northern Pacific Ry., Capital	5%	330	26,523.75
33,800	Old Colony R. R. Co., Capital	7%	338	39,612.50
76,600	Pennsylvania R. R. Co.	4%	1,532	.....
65,000	Southern Pacific Co., Capital	6%	650	58,500.00
100,000	Union Pacific R. R., Common	10%	1,000	142,573.13
30,000	Vicksburg, Shreveport & Pacific Rwy. Co.	5%	300	29,250.00
$1,210,700	*Total Railroad Stocks*			$1,044,296.68
	REAL ESTATE BONDS	*Rate*	*Maturity*	
$10,000	Cent. Mfg. Dist., 1st Mfg. R. E. Imp.	5½%	1931	$9,925.00
4,000	Cent. Mfg. Dist., 1st Mfg. R. E. Imp.	5½%	1940	3,970.00
9,000	Cent. Mfg. Dist., 1st Mfg. R. E. Imp.	5½%	1941	8,955.00
14,000	Ellicott Sq. Co. of Buffalo, 1st Mtge.	5%	1935	13,580.00
427,000	Equitable Office Bldg. Corp., 35-Yr. Deb.	5%	1952	435,000.00
4,400	Equitable Real Estate Co., Gold Notes.	6%	1931	4,405.00
20,000	Equitable Real Estate Co., Gold Notes.	6%	1932	20,042.00
50,000	43 Exchange Pl. Bldg., 1st Mtge. S. F.	6%	1938	49,625.00
13,000	Jersey Mtge. & Title Guaranty Co.	5½%	1933	12,967.50
200,000	Lawyers Mtg. Invest. Corp. of Boston	5½%	1940	.....
50,000	Steiger Bldg., 1st Mtge. Gold.	5½%	1952	49,875.00
92,500	Trinity Bldg. Corp. of N. Y., 1st Mtge.	5½%	1939	90,399.24
	Matured during year			6,380.00
$893,900	*Total Real Estate Bonds*			$705,123.74
	REAL ESTATE STOCKS	*Div.*	*Shares*	
$58,800	Alaska Building Trust	4%	588	$58,251.22
20,000	Boston Cham. of Com. Realty Tr., 1st pf.	3%	200	19,200.00
68,000	Boston Real Estate Trust Capital	5%	680	71,661.64
$146,800	*Total Real Estate Stocks*			$149,112.86
	BANK STOCKS			
$35,800	First Nat'l Bank of Boston	16%	1790	$112,200.00
21,200	Guaranty Trust Co. of New York	20%	212	53,069.02
$57,000	*Total Bank Stocks*			$165,269.02

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
$32,998.96	.....	$132,250.00	.....	$8,050.00
.....	.....	9,680.00	.....	704.00
109,360.00	.....	109,360.00	.....	1,130.00
53,661.00	.....	61,461.00	.....	1,246.00
21,440.00	.....	60,300.00	.....	4,355.00
.....	.....	26,523.75	.....	1,650.00
.....	.....	39,612.50	.....	2,366.00
125,312.50	.....	125,312.50	.....	1,032.00
.....	.....	58,500.00	.....	3,900.00
37,426.87	.....	180,000.00	.....	10,000.00
.....	.....	29,250.00	.....	1,500.00
$562,583.83	$435.38	$1,606,445.13	.....	$79,151.75
.....	.....	$9,925.00	.....	$550.00
.....	.....	3,970.00	.....	220.00
.....	.....	8,955.00	.....	495.00
.....	.....	13,580.00	.....	700.00
.....	$8,000.00	427,000.00	.....	21,750.00
.....	5.00	4,400.00	.....	264.00
.....	21.00	20,021.00	.....	1,200.00
.....	.....	49,625.00	.....	3,000.00
.....	.....	12,967.50	.....	715.00
$199,500.00	.....	199,500.00	$336.11	.....
.....	.....	49,875.00	.....	2,750.00
.....	1,000.00	89,399.24	.....	5,142.50
.....	6,380.00	.....	.....	340.80
$199,500.00	$15,406.00	$889,217.74	$336.11	$37,127.30
.....	.....	$58,251.22	.....	$2,352.00
.....	.....	19,200.00	.....	800.00
.....	.....	71,661.64	.....	3,400.00
.....	.....	$149,112.86	.....	$6,552.00
$31,000.00	.....	$143,200.00	.....	$5,596.00
52,980.46	$49.48	106,000.00	.....	4,240.00
$83,980.46	$49.48	$249,200.00	.....	$9,836.00

Schedule H *(Continued)*

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	MORTGAGE NOTES			
$12,500	Beta Nu House Corporation	5½%	1934	$12,500.00
4,500	E. V. and C. H. Bigelow	5%	....	4,500.00
40,000	F. J. Holderried (2 at $20,000 each)	6%	1930	40,000.00
1,700	Gamma Pi Corp.	6%	....	3,400.00
7,000	N. & V. Lomusico	5%	....	7,000.00
75,000	Ella C. Martin	5¼%	1930	75,000.00
18,000	Theta Chi	5½%	1931	18,000.00
	Sold or matured during year			40,000.00
$158,700	*Total Mortgage Notes*			$200,400.00
	REAL ESTATE			
$205,632.55	Avon St. Land and Building (11–13)			$205,632.55
385,364.53	Franklin St. Land and Building (64–70)			385,364.53
100.00	Dorchester Land			100.00
40,000.00	Memorial Drive, Cambridge			.....
15,000.00	No. 7 Central St., Winchester, Land and Building			15,000.00
$646,097.08	*Total Real Estate*			$606,097.08
	MISCELLANEOUS			
$100,000	Aldred Investment Trust Deb.	4½%	1967	$111,319.00
*.....	Aldred Investment Trust Common	..	1000†	.....
*60,000	Old Colony Trust Associates	..	600†	30,000.00
200,000	Collateral Demand Notes	..	....	400,000.00
250,000	Participations, Lee, Higginson & Co.	..	....	.....
	Sold during year	..	....	.....
$610,000	*Total Miscellaneous*			$541,319.00

RECAPITULATION, GENERAL INVESTMENTS

		Per cent of total 1930	*Per cent of total 1929*	
$1,346,000.00	Government and Municipal Bonds	6.25	10.00	$1,879,328.03
1,215,000.00	Industrial Bonds	5.45	6.70	1,254,706.63
3,097,860.00	Industrial Stocks	15.15	10.30	1,922,562.66
5,684,800.00	Public Utility Bonds	25.35	28.20	5,267,846.29
677,400.00	Public Utility Stocks.	4.50	2.65	492,000.57
5,311,600.00	Railroad Bonds	23.50	23.90	4,454,853.25
1,210,700.00	Railroad Stocks.	7.40	5.60	1,044,296.68
893,900.00	Real Estate Bonds	4.10	3.75	705,123.74
146,800.00	Real Estate Stocks	.70	.80	149,112.86
57,000.00	Bank Stocks	1.15	.90	165,269.02
158,700.00	Mortgage Notes	.75	1.05	200,400.00
646,097.08	Real Estate	3.00	2.90	606,097.08
610,000.00	Miscellaneous.	2.70	3.25	541,319.00
$21,055,857.08	*Total General Investments*	100.00	100.00	$18,682,915.81

*No par value.
†Shares.

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$12,500.00	.....	$687.50
.....	.....	4,500.00	.....	225.00
.....	.....	40,000.00	.....	2,400.00
.....	$1,700.00	1,700.00	.....	165.74
.....	.....	7,000.00	.....	350.00
.....	.....	75,000.00	.....	3,937.50
.....	.....	18,000.00	.....	990.00
.....	40,000.00	.....	.....	2,982.22
.....	$41,700.00	$158,700.00	.....	$11,737.96
.....	.....	$205,632.55	$4,093.92	$13,035.90
.....	.....	385,364.53	12,413.96	39,230.44
.....	.....	100.00	72.80	.....
$40,000.00	.....	40,000.00	.....	.....
.....	.....	15,000.00	682.76	1,620.00
$40,000.00	.....	$646,097.08	$17,263.44	$53,886.34
.....	$306.00	$111,013.00	.....	$4,500.00
.....	.....	.....	.....	1,000.00
.....	.....	30,000.00	.....	1,200.00
$100,000.00	300,000.00	200,000.00	.....	17,133.33
250,000.00	.....	250,000.00	.....	1,561.19
.....	.....	.....	.....	13,566.54
$350,000.00	$300,306.00	$591,013.00	.....	$38,961.06
$22,937.50	$548,220.20	$1,354,045.33	$24,635.00	$137,006.51
398,695.64	467,883.39	1,185,518.88	3,778.61	60,137.50
2,335,828.08	966,300.34	3,292,090.40	137.50	176,604.83
482,266.25	248,321.83	5,501,790.71	2,064.25	269,312.75
589,202.13	101,261.83	979,940.87	1,083.33	33,970.18
1,002,695.42	351,261.80	5,106,286.87	8,522.13	221,423.10
562,583.83	435.38	1,606,445.13	.....	79,151.75
199,500.00	15,406.00	889,217.74	336.11	37,127.30
.....	.....	149,112.86	.....	6,552.00
83,980.46	49.48	249,200.00	.....	9,836.00
.....	41,700.00	158,700.00	.....	11,737.96
40,000.00	.....	646,097.08	17,263.44	53,886.34
350,000.00	300,306.00	591,013.00	.....	38,961.06
$6,067,689.31	$3,041,146.25	$21,709,458.87	$57,820.37	$1,135,707.28

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	GOVERNMENT AND MUNICIPAL BONDS (EASTMAN CONTRACT)			
$260,000	Canada, Dominion of, 30-Yr. Gold	5%	1952	.....
115,000	Great Britain & Ireland	5½%	1937	$119,771.00
25,000	Imperial Japanese Govt. Ext. Loan	6½%	1954	23,125.00
30,000	Manitoba, Province of	4½%	1945	28,650.00
70,000	Manitoba, Province of	5%	1944	70,679.00
100,000	Montreal, City of	5%	1958	101,432.00
100,000	Montreal, City of	5%	1963	101,558.00
150,000	Ontario, Province of	5%	1942	151,686.00
50,000	Ontario, Province of	5%	1952	50,792.00
11,000	Ontario, Province of	5%	1959	10,945.00
40,000	Ottawa, City of	5½%	1932	40,492.00
5,000	Ottawa, City of	5%	1933	5,021.00
36,000	Ottawa, City of	5%	1934	36,182.00
35,000	Ottawa, City of	5%	1940	35,333.00
25,000	Ottawa, City of	5%	1945	25,252.00
25,000	Ottawa, City of	5%	1946	25,262.00
29,000	Ottawa, City of	5%	1954	29,578.00
100,000	Quebec, Province of	4½%	1950	97,000.00
200,000	Winnipeg, City of	4½%	1944	189,000.00
	Matured during year			67,314.34
$1,406,000	*Total Government and Municipal Bonds*			$1,209,072.34
	INDUSTRIAL BONDS (EASTMAN CONTRACT)			
$200,000	Armour & Co., Real Estate 1st Mtge.	4½%	1939	$175,116.25
50,000	Chile Copper Co., Gold Deb.	5%	1947	48,500.00
300,000	Consolidation Coal Co., 1st & Ref. S. F.	5%	1950	268,806.25
100,000	Gulf Oil Corp. of Penn., 15-Yr. Gold	5%	1937	.....
29,500	Swift & Co.	5%	1932	31,833.75
190,000	Western Electric Co., Deb.	5%	1944	188,288.75
50,000	Woodward Iron Co., 1st & Cons. Mtge.	5%	1952	42,750.00
	Sold or matured during year			150,913.00
$919,500	*Total Industrial Bonds*			$906,208.00

		Div.	*Shares*	
	INDUSTRIAL STOCKS (EASTMAN CONTRACT)			
*$1,875,000	Eastman Kodak Common	.8%	18,750	$1,875,000.00
180,000	Eastman Kodak Preferred	.6%	1,800	198,000.00
21,000	International Match Co., Part. Pfd.	.4%	600	18,711.30
$2,076,000	*Total Industrial Stocks*			$2,091,711.30

*No par value.

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
$258,511.88	.....	$258,511.88	.....	$6,500.00
.....	.....	119,771.00	.....	6,325.00
.....	.....	23,125.00	.....	1,625.00
.....	.....	28,650.00	.....	1,350.00
.....	49.00	70,630.00	.....	3,500.00
.....	52.00	101,380.00	.....	5,000.00
.....	48.00	101,510.00	.....	5,000.00
.....	141.00	151,545.00	.....	7,500.00
.....	36.00	50,756.00	.....	2,500.00
.....	.....	10,945.00	.....	550.00
.....	246.00	40,246.00	.....	2,200.00
.....	7.00	5,014.00	.....	250.00
.....	46.00	36,136.00	.....	1,800.00
.....	34.00	35,299.00	.....	1,750.00
.....	17.00	25,235.00	.....	1,250.00
.....	17.00	25,245.00	.....	1,250.00
.....	25.00	29,553.00	.....	1,450.00
.....	.....	97,000.00	.....	4,500.00
.....	.....	189,000.00	.....	9,000.00
.....	67,314.34	.....	$1,342.83	2,685.66
$258,511.88	$68,032.34	$1,399,551.88	$1,342.83	$65,985.66
.....	.....	$175,116.25	.....	$9,000.00
.....	.....	48,500.00	.....	2,500.00
.....	.....	268,806.25	.....	15,000.00
$96,750.00	.....	96,750.00	.....	2,500.00
.....	$3,022.50	28,811.25	.....	1,625.00
.....	.....	188,288.75	.....	9,500.00
.....	.....	42,750.00	.....	2,500.00
.....	150,913.00	.....	.....	3,700.00
$96,750.00	$153,935.50	$849,022.50	.....	$46,325.00
.....	$96,993.75	$1,778,006.25	.....	$150,000.00
.....	.....	198,000.00	.....	10,800.00
.....	.....	18,711.30	.....	2,160.00
.....	$96,993.75	$1,994,717.55	.....	$162,960.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	PUBLIC UTILITY BONDS (EASTMAN CONTRACT)			
$200,000	Alabama Power Co., 1st Mtge. "A"	5%	1946	$191,501.25
200,000	Am. Tel. & Tel. 35-Yr. Deb.	5%	1960	190,000.00
100,000	Cedars Rapids Mfg. & P'r Co., S. F.	5%	1953	99,875.00
50,000	Ch.N.Sh.&Mil.R.R.Co.,1st&Ref.Mt."A"	6%	1955	49,000.00
49,000	Cleveland Elec. Ill. Co., 1st Mtge.	5%	1939	49,296.00
200,000	Consolidated Gas Co. of N. Y.	5½%	1945	202,361.00
100,000	Consolidated Gas & El. Lt. & Pr. Co.	4½%	1935	96,500.00
200,000	Consumers Power Co., 1st & Ref.	5%	1936	199,000.00
55,000	Cumberland County P'r&Lt.Co.,1st Mt.	4½%	1956	51,837.50
500,000	Edison Elec. Ill. Co., Boston Notes	4½%	1930	499,375.00
10,000	Hydraulic Pr. Co. of Niagara Falls	5%	1951	10,053.00
50,000	Illinois Pr.&Lt.Corp., 1st&Ref.Mt."B"	5½%	1954	48,500.00
100,000	Montreal Lt., Heat & Pr., 1st Mtge.	4½%	1932	98,750.00
100,000	Nebraska Power Co., 1st Mtge. "A"	5%	1949	98,750.00
100,000	Pacific Gas & El. Co., 1st Ref. Mt. "B"	6%	1941	103,300.00
50,000	SanJoaquinLt.&Pr.Co.Un.&Ref.Gold"D"	5%	1957	49,125.00
50,000	Syracuse Lt. Co., Inc., 1st&Ref. Mtge.	5½%	1954	50,620.00
50,000	Tennessee Pr. Co., 1st Mtge.	5%	1962	46,625.00
100,000	Western Union Tel. Co.	5%	1951	100,000.00
	Sold or matured during the year			49,802.50
$2,264,000	*Total Public Utility Bonds*			$2,284,271.25

Par Value	*Description of Securities*	*Div.*	*Shares*	*Balance June 30, 1929*
	PUBLIC UTILITY STOCKS (EASTMAN CONTRACT)			
$50,000	Central Illinois Pub. Ser. Co., Pref.	6%	500	$42,937.50
28,600	Edison Electric Ill. Co., Capital.	13.60	286	57,802.50
50,000	Knoxville Pr. & Lt. Co., Pref.	7%	500	49,375.00
*50,000	Memphis Pr. & Lt. Co., Pref..	7%	500	49,375.00
50,000	Public Service Elec. & Gas. Co., Pref.	6%	500	47,250.00
$228,600	*Total Public Utility Stocks*			$246,740.00

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	RAILROAD BONDS (EASTMAN CONTRACT)			
$48,000	Canadian Pac. Ry. Co., Equip. Tr.	5%	1944	.....
100,000	Chicago & Northwestern R.R.Co.Gen'l	4%	1987	$96,500.00
50,000	Chic., Rock Is. & Pacific, 1st & Ref. Mt.	4%	1934	42,406.25
100,000	Delaware & Hudson, 1st & Ref. Mtge..	4%	1943	89,500.00
50,000	East Penn. Ry. Co., 1st Mtge.	5%	1936	46,875.00
100,000	Florida East Coast Ry.Co.,1st&Ref.Mt.	5%	1974	95,633.75

*No par value.

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$191,501.25	.....	$10,000.00
.....	.....	190,000.00	.....	10,000.00
.....	.....	99,875.00	.....	5,000.00
.....	.....	49,000.00	.....	3,000.00
.....	$33.00	49,263.00	.....	2,450.00
.....	157.00	202,204.00	.....	11,000.00
.....	.....	96,500.00	.....	4,500.00
.....	.....	199,000.00	.....	10,000.00
.....	.....	51,837.50	.....	2,475.00
.....	.....	499,375.00	.....	22,500.00
.....	3.00	10,050.00	.....	500.00
.....	.....	48,500.00	.....	2,750.00
.....	.....	98,750.00	.....	4,500.00
.....	.....	98,750.00	.....	5,000.00
.....	300.00	103,000.00	.....	6,000.00
.....	.....	49,125.00	.....	2,500.00
.....	26.00	50,594.00	.....	2,750.00
.....	.....	46,625.00	.....	2,500.00
.....	.....	100,000.00	.....	5,000.00
.....	49,802.50	.....	.....	1,250.00
.....	$50,321.50	$2,233,949.75	.....	$113,675.00
.....	.....	$42,937.50	.....	$3,000.00
.....	.....	57,802.50	.....	3,775.20
.....	.....	49,375.00	.....	3,500.00
.....	.....	49,375.00	.....	3,500.00
.....	.....	47,250.00	.....	3,000.00
.....	.....	$246,740.00	.....	$16,775.20
$49,080.00	$77.00	$49,003.00	$306.67	.....
.....	.....	96,500.00	.....	4,000.00
.....	.....	42,406.25	.....	2,000.00
.....	.....	89,500.00	.....	4,000.00
.....	.....	46,875.00	.....	2,500.00
.....	.....	95,633.75	.....	5,000.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1939*
	RAILROAD BONDS (EASTMAN CONTRACT) *Continued*			
$11,000	Illinois Central R. R. Equip. Trust "K"	4½%	1931	$10,876.51
4,000	Illinois Central R. R. Equip. Trust "K"	4½%	1932	3,948.40
4,000	Illinois Central R. R. Equip. Trust "K"	4½%	1933	3,943.20
5,000	Illinois Central R. R. Equip. Trust "K"	4½%	1934	4,922.50
11,000	Illinois Central R. R. Equip. Trust "K"	4½%	1935	10,818.05
27,000	Illinois Central R. R. Equip. Trust "K"	4½%	1936	26,524.02
21,000	Illinois Central R. R. Equip. Trust "K"	4½%	1937	20,606.71
12,000	Illinois Central R. R. Equip. Trust "K"	4½%	1938	11,762.28
5,000	Illinois Central R. R. Equip. Trust "K"	4½%	1939	4,895.79
25,000	Ill. Cent. & Chic. St. L. & N. O. R.R.	4½%	1963	24,375.00
50,000	Kansas City, Ft. Scott & Memphis Cons.	4%	1936	41,243.75
50,000	Kansas City Terminal Ry., 1st Mtge. .	4%	1960	42,750.00
200,000	Minn., St. Paul & S. St. Marie Ry. Co..	4%	1938	175,710.00
100,000	Missouri, Pacific Ry. Co. 1st&Ref. Mt. "F"	5%	1977	99,750.00
50,000	New York, Chicago & St. Louis Ry.. .	5½%	1974	47,350.00
200,000	Northern Pacific Ry. Co., Ref.&Imp. "B"	6%	2047	215,322.00
5,000	Penn. R. R. Equip. Trust "A"	5%	1932	4,959.00
50,000	St. Louis Iron Mt. & Southern Ry. . .	4%	1933	42,290.00
50,000	South. Ry. Co., Dev. & Gen. Mtge. . .	4%	1956	37,492.50
100,000	Terminal R.R.Asso.of St.Louis Gen.Mt.	4%	1953	83,860.00
100,000	Union Term. Co. of Dallas, 1st Mt. S.F.	5%	1942	99,673.75
200,000	Virginian Ry. Co., 1st Mtge. "A" . .	5%	1962	191,737.50
	Sold or matured during year			57,782.87
$1,728,000	*Total Railroad Bonds*			$1,633,508.83

		Div.	*Shares*	
	RAILROAD STOCKS (EASTMAN CONTRACT)			
$8,800	Bangor & Aroostook R. R. Common .	3.50	176	$4,800.00
20,000	Bangor & Aroostook R. R., Pref. . . .	7%	200	19,000.00
143,500	New York Central R. R., Capital . .	8%	1,435	130,288.53
100,000	Pere Marquette Ry. Pr., Pref. Cum.. .	5%	1,000	80,024.40
$272,300	*Total Railroad Stocks*			$234,112.93

		Div.	*Shares*	
	MISCELLANEOUS (EASTMAN CONTRACT)			
$64,000	First National Bank of Boston	3.20	3,200	.....
4,000	First National Bank of New York. . .	100%	40	$104,328.00
300,000	Gannett Co., Inc., Note	5%	..	300,000.00
	Sold or matured during year			131,878.76
$368,000	*Total Miscellaneous*			$536,206.76

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$10,876.51	.....	$495.00
.....	.....	3,948.40	.....	180.00
.....	.....	3,943.20	.....	180.00
.....	.....	4,922.50	.....	225.00
.....	.....	10,818.05	.....	495.00
.....	.....	26,524.02	.....	1,215.00
.....	.....	20,606.71	.....	945.00
.....	.....	11,762.28	.....	540.00
.....	.....	4,895.79	.....	225.00
.....	.....	24,375.00	.....	1,125.00
.....	.....	41,243.75	.....	2,000.00
.....	.....	42,750.00	.....	2,000.00
.....	.....	175,710.00	.....	8,000.00
.....	.....	99,750.00	.....	5,000.00
.....	.....	47,350.00	.....	2,750.00
.....	$131.00	215,191.00	.....	12,000.00
.....	.....	4,959.00	.....	250.00
.....	.....	42,290.00	.....	2,000.00
.....	.....	37,492.50	.....	2,000.00
.....	.....	83,860.00	.....	4,000.00
.....	.....	99,673.75	.....	5,000.00
.....	.....	191,737.50	.....	10,000.00
.....	57,782.87	.....	.....	2,610.00
$49,080.00	$57,990.87	$1,624,597.96	$306.67	$80,735.00
$5,760.00	.....	$10,560.00	.....	$448.00
.....	.....	19,000.00	.....	1,400.00
10,519.69	.....	140,808.22	.....	10,856.00
.....	.....	80,024.40	.....	5,000.00
$16,279.69	.....	$250,392.62	.....	$17,704.00
$191 878.76	.....	$191,878.76	.....	$2,560.00
.....	.....	104,328.00	.....	4,000.00
.....	.....	300,000.00	.....	15,000.00
.....	$131,878.76	.....	.....	5,824.00
$191,878.76	$131,878.76	$596,206.76	.....	$27,384.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Per cent of total, 1930*	*Per cent of total, 1929*	*Balance June 30, 1929*
	RECAPITULATION, EASTMAN CONTRACT INVESTMENTS			
$1,406,000	Government and Municipal Bonds	14.70	12.80	$1,209,072.34
919,500	Industrial Bonds	9.00	9.60	906,208.00
2,076,000	Industrial Stocks	21.00	22.15	2,091,711.30
2,264,000	Public Utility Bonds	23.40	24.20	2,284,271.25
228,600	Public Utility Stocks	2.60	2.60	246,740.00
1,728,000	Railroad Bonds	17.30	17.30	1,633,508.83
272,300	Railroad Stocks	2.60	2.50	234,112.93
368,000	Miscellaneous	6.25	5.70	536,206.76
300,000	Cash Reserve	3.15	3.15	300,000.00
$9,562,400	*Total Investments (Eastman Contract)*	100.00	100.00	$9,441,831.41

		Rate	*Maturity*	
	INVESTMENTS, MALCOLM COTTON BROWN FUND			
15,000	Metro. West Side Elev. Ry. Co., Mtg..	4%	1938	$6,750.00
10,000	Metro. West Side Elev. Ry. Co., Mtge.	4%	1938	4,100.00
2,000	Southern Ry. Co., Dev. & Gen. Mtge. .	4%	1956	.....
	Sold or matured during year			1,992.51
$27,000	*Total*			$12,842.51
	INVESTMENTS, FRANK HARVEY CILLEY FUND			
$10,000	New York, City of, Corp. Stock	4¼%	1964	$10,330.00
5,000	St. Louis Iron Mt.&So.R.R.Mtg.(Reg.)	4%	1933	4,812.50
6,000	Edison Elec. Ill. Co. Boston, Gold	4½%	1930	6,010.00
9,000	Southern Ry. Co., Dev. & Gen. Mtge.	4%	1956	.....
5,000	Chic. & Northwestern Ry. Co. Equip. Tr.	5%	1938	5,000.00
2,500	Boston Elev. Ry. Co., 2d Pfd.	7%	25†	2,600.00
5,900	Edison Electric Ill. Co., Capital.	13.60	59†	12,667.09
7,500	Eastern Gas & Fuel Assoc., Pr. Pr.	4½%	75†	6,825.00
1,250	Springfield Ry. Companies Pref.	8%	25†	2,125.00
7,800	Boston & Albany R. R. Co., Capital.	8¾%	78†	12,589.50
1,000	Boston & Providence R. R. Corp.	8½%	10†	1,700.00
2,400	Mortgage Note, E. and A. Orlogski	5%	..	2,400.00
	Sold or matured during year			9,570.05
$63,350	*Total*			$76,629.14
	INVESTMENTS, COFFIN MEMORIAL FUND			
$35,000	Light & Power Securities Co. Pref.	6%	350†	.....
1,000	United Gas & Imp. Co., Pref.	5.00	10†	.....
$36,000				.....

†Shares

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
$258,511.88	$68,032.34	$1,399,551.88	$1,342.83	$65,985.66
96,750.00	153,935.50	849,022.50	.....	46,325.00
.....	96,993.75	1,994,717.55	.....	162,960.00
.....	50,321.50	2,233,949.75	.....	113,675.00
.....	.....	246,740.00	.....	16,775.20
49,080.00	57,990.87	1,624,597.96	306.67	80,735.00
16,279.69	.....	250,392.62	.....	17,704.00
191,878.76	131,878.76	596,206.76	.....	27,384.00
.....	.....	300,000.00	.....	9,000.00
$612,500.33	$559,152.72	$9,495,179.02	$1,649.50	$540,543.86
.....	.....	$6,750.00	.....	$600.00
.....	.....	4,100.00	.....	400.00
$1,795.00	.....	1,795.00	$30.02	40.00
.....	$1,992.51	.....	.....	90.00
$1,795.00	$1,992.51	$12,645.00	$30.02	$1,130.00
.....	$10.00	$10,320.00	.....	$425.00
.....	.....	4,812.50	.....	200.00
.....	10.00	6,000.00	.....	270.00
$8,077.50	.....	8,077.50	$135.11	180.00
.....	.....	5,000.00	.....	250.00
.....	.....	2,600.00	.....	175.00
.....	.....	12,667.09	.....	778.80
.....	.....	6,825.00	.....	260.23
.....	.....	2,125.00	.....	137.50
.....	.....	12,589.50	.....	682.50
.....	.....	1,700.00	.....	85.00
.....	.....	2,400.00	.....	120.00
.....	9,570.05	.....	.....	488.00
$8,077.50	$9,590.05	$75,116.59	$135.11	$4,052.03
$35,000.00	.....	$35,000.00	.....	$1,575.00
1,018.50	$45.46	973.04	.....	25.00
$36,018.50	$45.46	$35,973.04	.....	$1,600.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	INVESTMENTS, EBEN S. DRAPER FUND			
$22,000	Province of Ontario Deb.	5%	1959	$21,890.00
16,000	Georgia Ry. & Elec. Co., 1st Mt. S. F..	5%	1932	16,036.00
20,000	New York Tel. Co., 1st & Gen. Mtge. .	4½%	1939	19,395.00
4,000	Chic.Mil.,St. Paul & Pac.R.R.Gold"A"	5%	1975	4,067.00
16,000	C. M., St. P. & Pac.RR..Conv.Gold"A"	5%	2000	16,271.00
24,000	Indianapolis Un. Ry. Co., Gen. Mtge. .	5%	1965	23,880.00
$102,000	*Total*			$101,539.00
	INVESTMENTS, FRANCES AND WILLIAM EMERSON FUND			*
$86,000	Associated Gas & Elec. Co. (Reg.) . .	4½%	1949	.....
29,000	Southern Ry. Co. Dev. & Gen. Mtge. .	4%	1956	.....
$115,000				.....
	INVESTMENTS, HENRY C. FRICK FUND			
$50,000	Province of British Columbia	4½%	1939	$48,325.00
50,000	Province of Ontario Deb.	4½%	1934	48,314.30
50,000	Commonwealth Elec. Co., 1st Mtge.. .	5%	1943	47,937.50
51,000	Cumberland Tel. & Tel. Co., 1st Mtge.	5%	1937	50,305.75
25,000	Puget Sound P.&L.Co.1st Ref.Mtg."B"	5%	1931	24,812.50
50,000	American Radiator Co. Gold Deb. . .	4½%	1947	48,000.00
35,000	Chicago Post Office Ser.Bldg.1stMtg."A"	5½%	1936	.....
25,000	U. S. Cold Storage Co., 1st Mtge. R. E.	6%	1945	25,467.00
25,000	Canadian Natl. Rys.Equip.Tr.Gold "J"	4½%	1937	24,605.00
68,000	Chicago & No. West. Ry. Co. Gold . .	4¾%	1949	.....
25,000	Ill.Cent & Chic.,St.L.&New Orleans R.R.	4½%	1963	24,312.50
25,000	Lake Shore & Mich. So. R. R. Co. .	4%	1931	24,550.00
100,000	St. Louis, Iron Mt. & Southern Ry.Co.	5%	1931	100,062.00
25,000	Southern Ry.Co.Dev.& Gen.Mtge."A"	4%	1956	21,425.00
40,000	Union Pacific R. R. Co.	4½%	1967	38,800.00
*37,000	Cerro de Pasco Copper Corp.	6%	370†	18,870.00
170,000	Chic. & Northwestern Ry. Co. Com. .	5%	1700†	93,500.00
	Sold or matured during year		..	96,294.70
$851,000				$735,581.25
	INVESTMENTS, JOY SCHOLARSHIP FUND			
$5,000	Cedars Rapids Mfg.&Pr.Co.1st Mt.S.F.	5%	1953	$4,075.00
5,000	Mass. Hospital Life Insurance Co. . .	5%	..	5,000.00
8,000	Southern Ry. Co. Dev. & Gen. Mtge. .	4%	1956	.....
	Sold or matured during year			7,970.05
$18,000	*Total*			$17,045.05
	INVESTMENTS, RICHARD LEE RUSSEL FELLOWSHIP FUND			
$2,000	Trinity Build. Corp. of N. Y., 1st Mt. .	5½%	1939	$1,000.00
	INVESTMENTS, SUSAN H. SWETT SCHOLARSHIP FUND			
$10,000	Mass. Hospital Life Insurance Co.	5%	..	$10,000.00

*No par value.
†Shares.

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$21,890.00	.....	$1,100.00
.....	$18.00	16,018.00	.....	800.00
.....	.....	19,395.00	.....	900.00
.....	2.00	4,065.00	.....	200.00
.....	4.00	16,267.00	.....	800.00
.....	.....	23,880.00	.....	1,200.00
.....	$24.00	$101,515.00	.....	$5,000.00
$72,240.00	.....	$72,240.00	$1,786.56	$1,935.00
26,027.50	.....	26,027.50	435.34	580.00
$98,267.50	.....	$98,267.50	$2,221.90	$2,515.00
.....	.....	$48,325.00	.....	$2,250.00
.....	.....	48,314.30	.....	2,250.00
.....	.....	47,937.50	.....	2,500.00
.....	.....	50,305.75	.....	2,550.00
.....	.....	24,812.50	.....	1,250.00
.....	.....	48,000.00	.....	2,250.00
$34,562.50	.....	34,562.50	.....	962.50
.....	$32.00	25,435.00	.....	1,500.00
.....	.....	24,605.00	.....	1,125.00
68,000.00	.....	68,000.00	$215.56	1,615.00
.....	.....	24,312.50	.....	1,125.00
.....	.....	24,550.00	.....	1,000.00
.....	62.00	100,000.00	.....	5,000.00
.....	.....	21,425.00	.....	1,000.00
.....	.....	38,800.00	.....	1,800.00
.....	.....	18,870.00	.....	2,220.00
.....	.....	93,500.00	.....	11,900.00
.....	96,294.70	.....	1,803.39	3,705.30
$102,562.50	$96,388.70	$741,755.05	$2,018.95	$46,002.80
.....	.....	$4,075.00	.....	$250.00
.....	.....	5,000.00	.....	250.00
$7,180.00	.....	7,180.00	$118.22	160.00
.....	$7,970.05	.....	.....	360.00
$7,180.00	$7,970.05	$16,255.00	$118.22	$1,020.00
$1,000.00	.....	$2,000.00	.....	$110.00
.....	.....	$10,000.00	.....	$500.00

Schedule H (*Continued*)

Par Value	*Description of Securities*	*Rate*	*Maturity*	*Balance June 30, 1929*
	INVESTMENTS, JONATHAN WHITNEY FUND			
$25,000	Montreal, City of, Canada	5%	1936	$25,000.00
25,000	New York, City of, Corporate Stock.	4¼%	1964	25,880.00
54,000	Canada, Dominion of, 10-Yr. Gold	4½%	1936	.....
21,000	Standard Oil Co. of New York	4½%	1935	21,073.00
24,000	Swift & Co., 1st Sinking Fund	5%	1944	21,720.00
28,000	Western Electric Co., Deb.	5%	1944	27,720.00
25,000	Detroit Edison Co., 1st Mtge.	5%	1933	25,090.00
25,000	Georgia Rail. & Elec. Co., 1st Mtge.	5%	1932	25,084.00
25,000	N. Y. Tel. Co., 1st & Gen. Mtge.	4½%	1939	24,150.39
25,000	Western Tel. & Tel. Co., Co. Tr.	5%	1932	25,094.00
25,000	Atch.,Top.&S.F.,Cal.&Ar.Lines, 1st Mt.	4½%	1962	24,381.25
35,000	Chicago Union Station, 1st Mtge.	4½%	1963	35,189.00
25,000	Illinois Cen. R. R. Co., Sec. Gold	4%	1952	22,625.00
50,000	Kansas City Terminal Ry. Co., 1st Mt.	4%	1960	42,750.00
25,000	Maine Cen. R. R. Co., 1st & Ref. Mt.	4½%	1935	25,005.00
7,000	New York Central Equip. Tr.	4½%	1935	7,000.00
9,000	New York Central Lines, Eq. Tr.	4½%	1936	8,558.10
5,000	Penn. R. R. Eq. Tr. "A"	5%	1936	4,950.00
10,000	Southern Ry. Co. Dev. & Gen. Mtge.	4%	1956	.....
150,000	Mortgage Note, M. I. T. Dormitory.	5%	..	150,000.00
	Sold or matured during year			55,227.62
$618,000	*Total*			$596,497.36
$32,423,557.08	Grand Total, All Investments (*Schedule D*)			$29,675,881.53

RECAPITULATION, ALL INVESTMENTS

	Per cent of total 1930	*Per cent of total 1929*	*Book Value June 30, 1930*
Government and Municipal Bonds	9.10	11.40	$2,986,558.01
Industrial Bonds	6.65	7.80	2,193,474.38
Industrial Stocks	16.15	13.60	5,305,677.95
Public Utility Bonds	24.55	26.50	8,086,673.60
Public Utility Stocks	3.90	2.60	1,286,871.00
Railroad Bonds	22.20	22.20	7,309,108.18
Railroad Stocks	6.00	4.70	1,964,627.25
Real Estate Bonds	2.80	2.40	925,780.24
Real Estate Stocks	.45	.50	149,112.86
Bank Stocks	1.70	1.30	545,406.76
Mortgage Notes	1.85	2.20	611,100.00
Real Estate	1.95	2.00	646,097.08
Miscellaneous	1.80	1.80	591,013.00
Cash Reserve	.90	1.00	300,000.00
	100.00	100.00	$32,901,500.31

Schedule H (*Continued*)

Purchases and Charges during the year	*Sales and Credits during the year*	*Balance June 30, 1930*	*Accrued Interest, etc.*	*Income Received*
.....	.....	$25,000.00	.....	$1,250.00
.....	$26.00	25,854.00	.....	1,062.50
$53,257.50	.....	53,257.50	.....	1,215.00
.....	15.00	21,058.00	.....	945.00
.....	.....	21,720.00	.....	1,200.00
.....	.....	27,720.00	.....	1,400.00
.....	30.00	25,060.00	.....	1,250.00
.....	42.00	25,042.00	.....	1,250.00
.....	.....	24,150.39	.....	1,125.00
.....	47.00	25,047.00	.....	1,250.00
.....	.....	24,381.25	.....	1,125.00
.....	6.00	35,183.00	.....	1,575.00
.....	.....	22,625.00	.....	1,000.00
.....	.....	42,750.00	.....	2,000.00
.....	1.00	25,004.00	.....	1,125.00
.....	.....	7,000.00	.....	315.00
.....	.....	8,558.10	.....	405.00
.....	.....	4,950.00	.....	250.00
8,975.00	.....	8,975.00	$150.12	200.00
.....	.....	150,000.00	.....	7,500.00
.....	55,227.62	.....	479.59	1,874.17
$62,232.50	$55,394.62	$603,335.24	$629.71	$29,316.67
$6,997,323.14	$3,771,704.36	$32,901,500.31	$64,623.78	$1,767,497.64

SCHEDULE J
EDUCATIONAL PLANT

Land, Buildings and Equipment

Land, Boylston, Clarendon and Newbury Streets, Boston	$1,500,000.00
Rogers Building, Boylston Street, Boston	204,534.76
Walker Building, Boylston Street, Boston	150,000.00
Land, east of Massachusetts Avenue, Cambridge	1,125,766.67
Land, west of Massachusetts Avenue	854,014.82
Main Educational Building Group	4,071,492.13
Pratt School of Naval Architecture	674,971.70
Guggenheim Aeronautical Laboratory	293,637.46
Aeronautical Engine Testing Laboratory	121,101.92
Mechanic Arts Building	83,658.89
Power Plant (inc. Machinery and Equipment)	302,569.27
Homberg Memorial Infirmary	188,441.60
Educational Equipment, Cambridge	2,039.953.60
Steam and Electrical Distribution System, Cambridge	155,448.64
Gas Engine Laboratory	26,301.88
Automotive Laboratory	11,000.00
Compression Laboratory	31,000.00
Tractor Garage	6,400.00
Service Garage	5,981.54
Athletic Field	24,815.14
Walker Memorial Building	575,111.50
Walker Memorial Building, Equipment	139,475.52
Dormitories (1916) ($331,357.67 less mortgage $150,000)	181,357.67
Dormitories (1916) Equipment	26,967.85
Dormitory, Class of '93	185,718.91
Dormitory, Class of '93, Equipment	9,518.04
Alumni Dormitories (1928)	291,274.49
Alumni Dormitories (1928) Equipment	18,971.05
Alumni Dormitories (1930)	126,954.79
Service Building	42,988.20
Boathouse	54,244.13
Squash Courts	29,042.54
Summer Camp, East Machias, Maine	120,558.00
Summer Camp, Dover, New Jersey	35,000.00
Miscellaneous	301,726.27
Total, June 30, 1930 (Schedule D)	$14,009,998.98

SCHEDULE K

PRINCIPAL GIFTS AND APPROPRIATIONS FOR EDUCATIONAL PLANT

George Eastman, for New Buildings	$3,500,000.00
Maria A. Evans, for Dormitories	161,192.55
Class of 1893, for Dormitory	100,000.00
Appropriation, Maria A. Evans Fund	169,080.60
T. C. du Pont, Donation for Land	625,000.00
T. C. du Pont, Donation for Dormitories	100,000.00
T. C. and P. S. du Pont, Charles Hayden, for Mining Building	215,000.00
Pratt Fund, for School of Naval Architecture	675,150.00
Alumni Fund, Equipment, Dormitories and Walker Memorial	622,119.38
Alumni Dormitory Fund	510,245.54
Walker Memorial Fund, for Walker Memorial	167,303.96
Improvement Fund for Walker Memorial	24,491.04
Appropriation of Emma Rogers Fund, for Equipment	528,077.06
Daniel Guggenheim Fund	230,000.00
Estate of F. W. Emery, for Equipment	126,423.80
Appropriation of Charles C. Drew Fund	305,171.52
Appropriation of Lucius Tuttle Fund for Equipment	50,000.00
Subscriptions to Homberg Memorial Infirmary	110,225.00
A. P. Sloan, Jr., for Aero Engine Laboratory	65,000.00
Appropriation of Frank E. Peabody Fund	52,238.89
Appropriation of Nathaniel Thayer Fund for Equipment	25,000.00
Appropriation of French Fund for Equipment	100,843.34
Appropriation of George B. Dorr Fund for Equipment	49,573.47
Land in Boston, Grant of Commonwealth (estimated)	1,500,000.00
Appropriation of A. F. Estabrook Fund for Land	85,000.00
Anonymous for Boat House Additions	30,000.00
Appropriation of Ida F. Estabrook Fund for Land	20,000.00
Appropriation of Miscel. Unrestricted Funds for Land	151,697.89
Subscriptions for Land	125,525.00
Sale of Land and Buildings in Boston	656,919.45
Equipment from Buildings in Boston (estimated)	500,000.00
Other Funds, Donations, Appropriations, etc.	2,501,765.70
Total, June 30, 1930 (Schedule D)	$14,083,044.19

SCHEDULE P

ENDOWMENT FUNDS FOR GENERAL PURPOSES

Restricted Funds	*Funds, June 30, 1929*	*Investment Income*	[3] *Other Income*	*Expended or Transferred*	*Funds, June 30, 1930*
George Robert Armstrong	$5,000.00	$270.00	$750.00	$270.00	$5,750.00
Charles Choate	35,858.15	1,944.00	5,250.00	1,944.00	41,108.15
Eben S. Draper	102,400.00	5,000.00	.....	5,000.00	102,400.00
[1]Eastman Contract . . .	6,346,053.90	538,894.36	.....	238,894.36	6,646,053.90
George Eastman (Building)	2,500,000.00	135,000.00	375,000.00	135,000.00	2,875,000.00
Charles W. Eaton . . .	243,469.11	13,122.00	32,400.00	13,122.00	275,869.11
Educational Endowment	7,571,898.60	408,888.00	1,137,210.00	408,888.00	8,709,108.60
Martha Ann Edwards . .	30,000.00	1,620.00	4,500.00	1,620.00	34,500.00
William Endicott . . .	25,000.00	1,350.00	3,750.00	1,350.00	28,750.00
Francis Appleton Foster .	1,000,000.00	54,000.00	150,000.00	54,000.00	1,150,000.00
Alexis H. French	.....	.....	5,000.00	.....	5,000.00
Jonathan French	25,212.48	1,350.00	3,750.00	1,350.00	28,962.48
Henry C. Frick	742,918.88	43,983.85	.....	43,983.85	742,918.88
General Endowment . .	1,527,549.00	82,458.00	229,050.00	82,458.00	1,756,599.00
James Fund	163,654.21	8,856.00	24,450.00	8,856.00	188,104.21
Katharine B. Lowell . .	5,000.00	270.00	750.00	270.00	5,750.00
M. I. T. Alumni Fund (Bal.)	1,383.34	75.60	.....	.....	1,458.94
Thomas McCammon . .	.....	378.00	15,000.00	378.00	15,000.00
Kate M. Morse	25,000.00	1,350.00	3,750.00	1,350.00	28,750.00
Richard Perkins	50,000.00	2,700.00	7,500.00	2,700.00	57,500.00
J. W. and B. L. Randall	83,452.36	4,482.00	12,450.00	4,482.00	95,902.36
Wm. Barton Rogers Mem.	250,225.00	13,500.00	37,500.00	13,500.00	287,725.00
[2]Saltonstall Fund	55,594.96	3,024.00	8,250.00	2,268.00	64,600.96
Samuel E. Sawyer . . .	4,764.40	253.80	600.00	253.80	5,364.40
Andrew Hastings Spring	50,000.00	2,700.00	7,500.00	2,700.00	57,500.00
Seth K. Sweetser	25,061.62	1,350.00	3,750.00	1,350.00	28,811.62
William J. Walker . . .	23,663.59	1,296.00	3,450.00	1,296.00	27,113.59
Horace Herbert Watson .	.....	.....	13,497.50	.....	13,497.50
Albion K. P. Welch . . .	5,000.00	270.00	750.00	270.00	5,750.00
	$20,898,159.60	$1,328,385.61	$2,085,857.50	$1,027,554.01	$23,284,848.70
Unrestricted Funds					
Edmund D. Barbour . .	$592,251.01	$31,968.00	$86,250.00	$31,968.00	$678,501.01
Henrietta G. Fitz	.....	135.00	10,000.00	135.00	10,000.00
Frederick S. Hodges . .	49,966.26	2,700.00	7,350.00	2,700.00	57,316.26
Industrial Fund	87,030.61	5,076.00	27,000.00	13,968.88	105,137.73
Hiram F. Mills	10,175.00	540.00	1,500.00	540.00	11,675.00
Moses W. Oliver	11,220.49	594.00	1,650.00	594.00	12,870.49

[1] Income added to Fund. See also Special Deposit Fund.
[2] One-fourth Income added to Fund.
[3] Including 15 per cent distribution from Endowment Reserve Fund.

Schedule P (*Continued*)

Unrestricted Funds (Continued)	*Funds, June 30, 1929*	*Investment Income*	*[3]Other Income*	*Expended or Transferred*	*Funds, June 30, 1930*
Russell Robb	$25,000.00	$1,350.00	$3,750.00	$1,350.00	$28,750.00
Robert E. Rogers	7,680.77	415.80	1,050.00	415.80	8,730.77
Ellen V. Smith	.....	648.00	25,000.00	648.00	25,000.00
Sturgis H. Thorndike	15,000.00	810.00	.....	810.00	15,000.00
Horace W. Wadleigh	2,143.14	108.00	300.00	108.00	2,443.14
Kenneth F. Wood	25,000.00	1,350.00	3,750.00	1,350.00	28,750.00
	$825,467.28	$45,694.80	$167,600.00	$54,587.68	$984,174.40

SCHEDULE Q

ENDOWMENT FUNDS FOR DESIGNATED PURPOSES

Special Deposit Funds					
New Dormitory, General	$89,208.12	$6,750.00	$108,546.50	$200,000.00	$4,504.62
[2]Geo. Eastman (due under contract)	3,150,000.00	.....	.....	300,000.00	2,850,000.00
Endowment Reserve	636,875.07	80,317.91	2,723,339.61	2,860,148.63	580,383.96
[1]Anonymous (1924)	1,371.85	75.60	.....	.....	1,447.45
1923 Endowment	169.14	.....	24.15	.....	193.29
[1]1923 Endowment Reserve	3,814.62	205.20	1,632.72	609.92	5,042.62
[1]1924 Endowment	1,072.90	64.80	268.88	.....	1,406.58
[1]1924 Endowment Reserve	2,389.50	129.60	1,768.43	422.46	3,865.07
[1]1925 Endowment	1,072.19	54.00	.....	.....	1,126.19
[1]1925 Endowment Reserve	1,209.10	64.80	1,281.50	592.94	1,962.46
1926 Endowment	255.56	.....	3.00	.....	258.56
1926 Endowment Reserve	[4]32.14	.....	1,009.87	914.75	62.98
1927 Endowment	89.80	.....	1,589.52	.....	1,679.32
1927 Endowment Reserve	9.90	.....	.....	9.90	.....
[1]1928 Endowment	1,366.60	75.60	1,727.10	.....	3,169.30
1929 Endowment	435.00	27.00	106.50	.....	568.50
[1]1930 Endowment	.....	.....	375.00	.....	375.00
M.I.T. Teachers' Insurance	1,937.71	.....	22,238.34	21,915.50	2,260.55
[1]M. I. T. Alumni Association Permanent Funds	.....	918.00	24,651.97	.....	25,569.97
[1]M.I.T. Teachers' Insurance (Special)	14,860.03	1,026.00	6,500.00	.....	22,386.03
[1]Class of '98 Loan	5,283.90	297.00	645.00	.....	6,225.90
[1]Gen.Elec.Co.VI and VIII	25,660.50	1,404.00	.....	.....	27,064.50
[1]Richards Portrait	436.35	21.60	.....	.....	457.95
Sedgwick Memorial Lecture Fund	.....	.....	3,913.34	221.98	3,691.36
[1]Elihu Thomson	5,138.75	270.00	.....	.....	5,408.75
[1]Treasurer's Fund	5,138.75	405.00	5,000.00	10,045.00	498.75
[1]Undergraduate Dues, Reserve	10,963.20	594.00	500.00	300.00	11,757.20
	$3,958,726.40	$92,700.11	$2,905,121.43	$3,395,181.08	$3,561,366.86

[1] Income added to Fund.
[2] See also Funds for General Purposes (Eastman Contract)
[3] Including 15 per cent distribution from Endowment Reserve Fund.
[4] Overdraft.

Schedule Q (*Continued*)

	Funds June 30, 1929	*Investment Income*	[2] *Other Income*	*Expended or Transferred*	*Funds, June 30, 1930*
FUNDS FOR SALARIES					
Samuel C. Cobb For General Salaries	$36,551.31	$1,998.00	$5,400.00	$1,998.00	$41,951.31
Sarah H. Forbes For General Salaries	500.00	27.00	.....	27.00	500.00
George A. Gardner For General Salaries	20,000.00	1,080.00	3,000.00	1,080.00	23,000.00
Daniel Guggenheim Professorship in Meteorology	8,666.00	216.00	.....	6,500.00	2,382.00
James Hayward Professorship of Engineering	18,800.00	1,015.20	2,700.00	1,015.20	21,500.00
William P. Mason Professorship of Geology	18,800.00	1,015.20	2,700.00	1,015.20	21,500.00
Henry B. Rogers For General Salaries	25,000.00	1,350.00	3,750.00	1,350.00	28,750.00
Nathaniel Thayer Professorship of Physics	25,000.00	1,350.00	3,750.00	1,350.00	28,750.00
	$153,317.31	$8,051.40	$21,300.00	$14,335.40	$168,333.31
FUNDS FOR LIBRARY, READING ROOMS AND GYMNASIUM					
Walter S. Barker	$10,215.90	$540.00	$1,500.00	$397.59	$11,858.31
Ednah Dow Cheney	15,322.95	810.00	2,258.70	155.08	18,236.57
Frank Harvey Cilley	77,834.05	3,916.92	29.95	1,095.00	80,685.92
Charles Lewis Flint	5,208.33	270.00	750.00	224.00	6,004.33
William Hall Kerr	2,770.89	145.80	300.00	68.32	3,148.37
George A. Osborne	10,172.10	540.00	1,500.00	291.52	11,920.58
Arthur Rotch Arch	5,277.50	286.20	750.00	.....	6,313.70
Technology Matrons' Teas	6,253.62	334.80	.....	.....	6,588.42
John Hume Tod	2,771.41	145.80	300.00	127.72	3,089.49
Theodore N. Vail	38,977.00	2,052.00	5,857.26	1,484.30	45,401.96
	$174,803.75	$9,041.52	$13,245.91	$3,843.53	$193,247.65
FUNDS FOR DEPARTMENTS					
William Parsons Atkinson	$13,082.20	$702.00	$1,950.00	$702.00	$15,032.20
Frank Walter Boles Memorial	26,123.66	1,377.00	2,400.00	1,041.30	28,859.36
William E. Chamberlain	7,309.77	394.20	1,050.00	394.20	8,359.77
Chemical Engineering Practice	257,772.97	13,932.00	38,550.00	13,932.00	296,322.97
Crosby Honorary Fund	1,661.01	81.00	.....	155.50	1,586.51
Susan E. Dorr	95,955.67	5,184.00	14,250.00	5,184.00	110,205.67
George Eastman	400,000.00	21,600.00	60,000.00	21,600.00	460,000.00
Daniel Guggenheim	5,555.00	162.00	.....	2,500.00	3,217.00
George Henry May	5,000.00	270.00	750.00	270.00	5,750.00
Susan Minns	.....	.....	40,000.00	.....	40,000.00
Forris Jewett Moore	26,267.80	1,458.00	4,847.19	604.55	31,968.44
William E. Nickerson	46,410.07	2,214.00	6,900.00	8,104.02	47,420.05
Edward D. Peters	5,330.37	270.00	750.00	405.91	5,944.46
Pratt Naval Architectural	392,235.81	21,168.00	58,800.00	21,168.00	451,035.81
Arthur Rotch	25,000.00	1,350.00	3,750.00	1,350.00	28,750.00
W. T. Sedgwick	71,542.64	4,158.00	5,778.91	.....	81,479.55
[1]Edmund K. Turner	236,850.30	12,798.00	35,400.00	10,107.45	274,940.85
	$1,616,097.27	$87,118.20	$275,176.10	$87,518.93	$1,890,872.64

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

[2] Including 15 per cent distribution from Endowment Reserve Fund.

Schedule Q (*Continued*)

	Funds June 30, 1929	*Investment Income*	[2] *Other Income*	*Expended or Transferred*	*Funds, June 30, 1930*
FUNDS FOR RESEARCH					
John E. Aldred	$66,936.77	$3,618.00	$9,900.00	$16,678.38	$63,776.39
Samuel Cabot	73,535.77	3,942.00	10.950.00	3,300.00	85,127.77
Crane Automotive Research	12,527.90	486.00	.....	5,100.00	7,913.90
Daniel Guggenheim	5,333.00	216.00	.....	.....	5,549.00
Ellen H. Richards	18,694.20	1,026.00	2,814.75	804.20	21,730.75
Charlotte B. Richardson	40,789.29	2,214.00	6,000.00	1,600.00	47,403.29
Technology Plan Research	2,263.32	118.80	.....	.....	2,382.12
Textile Research Fund	.....	.....	42,694.10	.....	42,694.10
Edward Whitney	60,383.11	3,240.00	9,000.00	3,000.00	69,623.11
	$280,463.36	$14,860.80	$81,358.85	$30,482.58	$346,200.43
FUNDS FOR FELLOWSHIPS					
Arkwright Club	$2,266.00	$118.80	$300.00	.....	$2,684.80
William Sumner Bolles	26,672.59	1,404.00	3,900.00	$1,250.00	30,726.59
Malcolm Cotton Brown	13,454.12	1,099.98	7.49	1,000.00	13,561.59
Collamore	14,136.11	756.00	2,100.00	700.00	16,292.11
H. M. Crane	.....	.....	1,000.00	1,000.00	.....
Dalton Graduate Chemical	6,749.20	361.80	900.00	350.00	7,661.00
du Pont	.....	.....	750.00	750.00	.....
Daniel Guggenheim	6,333.00	216.00	.....	2,500.00	4,049.00
Rebecca R. Joslin	2,052.22	108.00	300.00	.....	2,460.22
Wilfred Lewis	.....	.....	5,000.00	.....	5,000.00
Moore	14,147.56	1,296.00	16,300.00	.....	31,743.56
Willard B. Perkins	7,512.24	405.00	1,050.00	1,500.00	7,467.24
Proctor	.....	.....	1,000.00	875.00	125.00
Proprietors Locks and Canals	2,249.75	162.00	2,300.00	1,000.00	3,711.75
Henry Bromfield Rogers	25,111.45	1,350.00	3,750.00	1,200.00	29,011.45
Richard Lee Russell	2,749.07	110.00	.....	.....	2,859.07
Henry Saltonstall	10,847.59	583.20	1,500.00	550.00	12,380.79
James Savage	12,116.36	648.00	1,800.00	600.00	13,964.36
A. P. Sloan, Jr.	[1]2,000.00	.....	3,000.00	1,000.00	.....
Susan H. Swett	11,595.45	750.00	.....	.....	12,345.45
Gerard Swope	2,638.75	.....	2,500.00	2,500.00	2,638.75
Louis Francisco Verges	10,444.76	540.00	1,500.00	500.00	11,984.76
	$169,076.22	$9,908.78	$48,957.49	$17,275.00	$210,667.49
FUNDS FOR SCHOLARSHIPS					
Elisha Atkins	$5,318.07	$286.20	$750.00	$300.00	$6,054.27
Billings Student	51,445.66	2,754.00	7,650.00	2,800.00	59,049.66
Jonathan Bourne	10,824.93	594.00	1,500.00	600.00	12,318.93
Harriet L. Brown	7,329.12	394.20	1,050.00	375.00	8,398.32
Nino Tesher Catlin	1,055.00	54.00	150.00	50.00	1,209.00
Chandler	3,059.97	162.00	450.00	.....	3,671.97
Lucius Clapp	5,172.46	275.40	750.00	300.00	5,897.86
Class of 1896	5,594.87	302.40	750.00	290.00	6,357.27
Lucretia Crocker	79,668.40	4,320.00	11,850.00	3,475.00	92,363.40
Isaac W. Danforth	5,416.37	291.60	750.00	300.00	6,157.97

[1] Overdraft.

[2] Including 15 per cent distribution from Endowment Reserve Fund

Schedule Q (*Continued*)

	Funds, June 30 1929	*Investment Income*	[1] *Other Income*	*Expended or Transferred*	*Funds, June 30, 1930*
Ann White Dickinson	$42,460.06	$2,268.00	$6,300.00	$2,300.00	$48,728.06
Thomas M. Drown	52,331.00	2,808.00	.....	2,700.00	52,439.00
du Pont	.....	.....	400.00	400.00	.....
Farnsworth	5,547.17	297.00	750.00	300.00	6,294.17
Charles Lewis Flint	5,545.19	297.00	750.00	300.00	6,292.19
Sarah S. Forbes	3,684.22	199.80	450.00	200.00	4,134.02
Fuel and Gas Scholarship	350.00	.....	.....	.....	350.00
George Hollingsworth	5,212.82	280.80	750.00	300.00	5,943.62
T. Sterry Hunt	3,265.81	172.80	450.00	165.00	3,723.61
William F. Huntington	5,410.38	291.60	750.00	300.00	6,151.98
Joy Scholarships	17,407.76	651.78	29.95	800.00	17,289.49
William Litchfield	5,477.70	291.60	750.00	300.00	6,219.30
Elisha T. Loring	5,487.49	291.60	750.00	300.00	6,229.09
Lowell Inst. Scholarship	2,629.82	140.40	300.00	125.00	2,945.22
George Henry May	6,711.33	356.40	1,375.00	290.00	8,152.73
James H. Mirrlees	2,642.97	140.40	300.00	140.00	2,943.37
Nichols Scholarship	5,420.11	291.60	750.00	300.00	6,161.71
Charles C. Nichols	5,477.99	291.60	750.00	300.00	6,219.59
W. E. Nickerson	.....	.....	500.00	500.00	.....
John Felt Osgood	5,391.11	291.60	750.00	300.00	6,132.71
George L. Parmelee	18,745.28	1,009.80	2,700.00	1,000.00	21,455.08
Richard Perkins	54,108.57	2,916.00	8,100.00	3,000.00	62,124.57
John P. Schenkl	21,431.96	1,134.00	3,150.00	1,100.00	24,615.96
Thomas Sherwin	5,455.65	291.60	750.00	300.00	6,197.25
Samuel E. Tinkham	2,401.18	129.60	300.00	125.00	2,705.78
F. B. Tough	483.30	27.00	.....	.....	510.30
Susan Upham	1,187.15	64.80	150.00	60.00	1,341.95
Vermont Scholarship	8,156.42	437.40	900.00	400.00	9,093.82
Ann White Vose	62,367.21	3,348.00	9,300.00	3,400.00	71,615.21
Arthur M. Waitt	10,419.48	540.00	1,500.00	550.00	11,909.48
Louis Weissbein	4,386.53	237.60	600.00	230.00	4,994.13
Frances Erving Weston	1,241.13	54.00	150.00	200.00	1,245.13
Samuel Martin Weston	264.91	.....	.....	200.00	64.91
Amasa J. Whiting	4,741.85	253.80	600.00	250.00	5,345.65
	$550,728.40	$29,239.38	$70,704.95	$29,625.00	$621,047.73
FUNDS FOR PRIZES					
Robert A. Boit	$5,265.96	$280.80	$750.00	$400.00	$5,896.76
Class of 1904	498.00	27.00	10.00	15.00	520.00
Roger D. Hunneman	1,011.00	54.00	150.00	50.00	1,165.00
James Means	2,672.22	140.40	300.00	.....	3,112.62
Arthur Rotch	6,219.13	334.80	900.00	300.00	7,153.93
Arthur Rotch, Special	7,955.81	432.00	1,050.00	200.00	9,237.81
	$23,622.12	$1,269.00	$3,160.00	$965.00	$27,086.12

[1] Including 15 per cent distribution from Endowment Reserve Fund.

Schedule Q (*Continued*)

	Funds, June 30, 1929	*Investment Income*	[2] *Other Income*	*Expended or Transferred*	*Funds, June 30, 1930*
FUNDS FOR RELIEF					
Edward Austin	$440,319.93	$23,760.00	$66,000.00	$25,415.20	$504,664.73
Thomas Wendell Bailey	2,548.15	135.00	300.00	130.00	2,853.15
[1]Charles Tidd Baker	25,360.77	1,350.00	3,750.00	650.00	29,810.77
Levi Boles	10,971.92	594.00	1,500.00	600.00	12,465.92
Bursar's Fund	7,030.17	405.00	7,105.93	4,328.49	10,212.61
Mabel Blake Case	26,921.35	1,458.00	3,900.00	1,500.00	30,779.35
Coffin Memorial	.....	1,600.00	36,018.50	.....	37,618.50
Dean's Fund	2,833.60	162.00	1,754.05	1,355.00	3,394.65
Carl P. Dennett	80.00	.....	300.17	215.00	165.17
Dormitory Fund	3,855.51	205.20	450.00	200.00	4,310.71
Frances and William Emerson	.....	293.10	100,279.00	.....	100,572.10
Norman H. George	93,802.39	5,076.00	13,950.00	5,000.00	107,828.39
John A. Grimmons	.....	.....	215.76	.....	215.76
James H. Haste	.....	.....	141,845.63	.....	141,845.63
David L. Jewell	25,693.75	1,404.00	.....	1,300.00	25,797.75
William B. Rogers	6,414.63	999.00	19,596.33	8,338.50	18,671.46
Summer Surveying Camp	903.04	.....	492.76	725.00	670.80
Teachers' Fund	120,597.46	6,534.00	18,000.00	4,331.00	140,800.46
Samson R. Urbino	1,072.00	54.00	150.00	50.00	1,226.00
Jonathan Whitney	602,975.53	28,686.96	2,288.21	29,244.00	694,706.70
Morrill Wyman	71,921.44	3,888.00	10,720.00	4,000.00	82,529.44
	$1,443,301.64	$76,604.26	$428,616.34	$87,382.19	$1,861,140.05

RECAPITULATION OF FUNDS

FOR GENERAL PURPOSES					
Restricted	$20,898,159.60	$1,328,385.61	$2,085,857.50	$1,027,554.01	$23,284,848.70
Unrestricted	825,467.28	45,694.80	167,600.00	54,587.68	984,174.40
FOR DESIGNATED PURPOSES					
Special Deposit Funds	$3,958,726.40	$92,700.11	$2,905,121.43	$3,395,181.08	$3,561,366.86
Salaries	153,317.31	8,051.40	21,300.00	14,335.40	168,333.31
Libraries, etc.	174,803.75	9,041.52	13,245.91	3,843.53	193,247.65
Departments	1,616,097.27	87,118.20	275,176.10	87,518.93	1,890,872.64
Research	280,463.36	14,860.80	81,358.85	30,482.58	346,200.43
Fellowships	169,076.22	9,908.78	48,957.49	17,275.00	210,667.49
Scholarships	550,728.40	29,239.38	70,704.95	29,625.00	621,047.73
Prizes	23,622.12	1,269.00	3,160.00	965.00	27,086.12
Relief	1,443,301.64	76,604.26	428,616.34	87,382.19	1,861,140.05
Total (Schedule D)	$30,093,763.35	$1,702,873.86	$6,101,098.57	$4,748,750.40	$33,148,985.38

[1]One-half of the income added to the principal.
[2]Including 15 per cent distribution from Endowment Reserve Fund.

SCHEDULE R
MINOR FUNDS

Name	Balance June 30, 1929	Income	Other Increases	Salaries and Expenses	Balance June 30, 1930
Aeronautical Eng., No. 640	$4,730.03	.....	$32.94	$658.48	$4,104.49
No. 649	1,601.33	.....	.....	1,601.33	.....
No. 691	.....	.....	[2]1,500.00	1,730.48	*230.48
No. 700	.....	.....	[1]500.00	.....	500.00
No. 715	.....	.....	[2]2,600.00	395.52	2,204.48
Coasting Expts.	.....	.....	[1]2,000.00	151.12	1,848.88
No. 740	.....	.....	[2]2,370.00	.....	2,370.00
Wind Tunnels	2,856.83	3,224.00	.....	3,481.05	2,599.78
Aldred Lectures	431.30	2,500.00	.....	1,422.02	1,509.28
Aldred Hydraulic Fund	.....	6,500.00	.....	7,362.71	*862.71
Alumni Dormitory Committee	1,268.87	.....	.....	46.98	1,221.89
Alumni Reunion, 1930	.....	19,437.50	.....	16,518.80	2,918.70
American Petroleum Institute	*493.21	6,147.23	.....	6,717.48	*1,063.46
Arch. Dept. — Library No. 695	.....	.....	[1]1,400.00	1,400.00	.....
Special Scholarship	.....	850.00	.....	850.00	.....
Travel. Scholarships	1,500.00	.....	[2]3,000.00	2,000.00	2,500.00
Biology — Food and Fisheries	891.46	435.50	[1]1,500.00	1,654.10	1,172.86
No. 717	.....	.....	[1]1,200.00	480.50	719.50
Biocinema Research	462.13	1,489.11	.....	1,552.38	398.86
Coffee Research	3,730.35	15,000.00	.....	15,669.62	3,060.73
Frigidaire Research	2,538.25	6,060.00	.....	3,996.85	4,601.40
Health Education	2,119.24	148.96	[1]500.00	1,373.48	1,394.72
General Sea Foods	.....	7,500.00	.....	303.43	7,196.57
Public Health	787.52	15.00	.....	.....	802.52
Simms Co. Research	2,388.00	2,516.90	.....	3,795.91	1,108.99
Met. Life Insurance Co.	2,017.50	2,000.00	.....	2,269.18	1,748.32
Boat House Equipment No. 346	1,422.44	2,070.00	[1]1,000.00	4,255.28	237.16
Carnegie Music Fund	1,898.81	.....	[1]500.00	2,292.88	105.93
Chemistry, Special	628.59	.....	.....	378.70	249.89
Chem. Eng. Special No. 624	440.76	220.30	.....	661.06	.....
No. 641	925.00	.....	.....	925.00	.....
No. 685	.....	.....	[1]1,500.00	1,500.00	.....
Res. Lab. App. Chemistry	*606.52	88,095.26	[1-2]13,400.00	101,269.01	*380.27
Res. Lab. Phys. Chem. Royalties	1,059.62	486.24	.....	202.86	1,343.00
Special Research No. 13,101	1,344.92	26.00	.....	.....	1,370.92
Steam Table Research	*426.60	3,019.27	.....	3,688.26	*1,095.59
Civil Engineering — No. 616	500.00	.....	.....	400.00	100.00
No. 632	364.19	40.00	[1]300.00	593.56	110.63
No. 650	800.00	.....	.....	800.00	.....
No. 734	.....	.....	[2]1,000.00	.....	1,000.00
No. 635	.....	.....	[2]2,000.00	.....	2,000.00
Trav. Schol. Hydraulics	.....	.....	[1]1,200.00	.....	1,200.00
Trav. Schol. Struct. Eng.	.....	.....	[1]1,500.00	500.00	1,000.00
Corson Const. Acct.	.....	.....	.....	1,904.60	*1,904.60
No. 694	.....	.....	[2]2,500.00	2,500.00	.....
No. 714	.....	323.95	[1]1,000.00	1,323.95	.....

Overdraft. [1]Appropriation from Current Funds. [2]By Transfer.

Schedule R (*Continued*)

Name	*Balance June 30, 1929*	*Income*	*Other Increases*	*Salaries and Expenses*	*Balance June 30, 1930*
(Civil Eng. — *Continued*)					
Hartford Flood Control	.....	.....	.....	$400.16	*$400.16
Master Plumbers Assoc.	.....	.....	.....	1,780.46	*1,780.46
No. 633	*$19,369.33	$22,130.53	.....	2,761.20	.....
No. 757	.....	.....	[1]$1,200.00	.....	1,200.00
Danish Warship Model No. 564	1,700.00	.....	.....	1,700.00	.....
Dining Service Reserve	16,417.68	200.00	[2]10,717.00	10,052.52	17,282.16
Div. of Mun. and Ind. Research	.....	10,826.66	[2]16,678.38	27,505.04	.....
Div. of Ind. Coöp. and Res. No. 2	19,365.88	380.00	[2]4,738.72	.....	24,484.60
Dormitory Tax	365.95	1,312.50	.....	1,285.00	393.45
Dormitory Laundry Account	.....	760.00	.....	760.00	.....
Electrical Engineering No. 468	10,868.32	58.41	.....	10,926.73	.....
Summer Colloquium	810.54	4.50	.....	815.04	.....
Edison Com. Res.	*2,219.80	2,219.80	.....	.....	.....
No. 710	.....	.....	[1]6,000.00	1,233.94	4,766.06
VI-A Fund	3,056.06	23.00	.....	2,318.28	760.78
VI-A Tax	.....	258.00	.....	258.00	.....
Network Analyzer	.....	1,785.00	.....	488.40	1,296.60
No. 594	615.37	.....	[1]6,500.00	6,339.28	776.09
Industrial Lighting	86.49	.....	.....	.....	86.49
Paper Ins. Cable	1,621.82	10.40	.....	1,607.69	24.53
Round Hill	4,071.52	68,021.95	[1]3,000.00	82,565.60	*7,472.13
Nat. Elec. Light Assoc.	.....	3,000.00	.....	200.16	2,799.84
No. 749	.....	.....	[1]575.00	.....	575.00
Engineering Administration No. 645	3,510.00	150.39	.....	3,660.39	.....
XV Fund	408.90	20.00	.....	124.50	304.40
No. 739	.....	.....	[1]5,280.00	57.46	5,222.54
No. 736	.....	.....	[1]250.00	.....	250.00
Employees Health Insurance	.....	4,539.00	.....	4,539.00	.....
General Library No. 662	4,893.00	.....	.....	4,893.00	.....
Geology, No. 727	.....	.....	[1]1,000.00	.....	1,000.00
Historic Memorials	994.21	.....	.....	58.15	936.06
Historic Tablets No. 723	.....	.....	[1]500.00	.....	500.00
Journal of Mathematics and Physics	2,716.44	271.70	[1]3,000.00	3,158.93	2,829.21
Letter Shop	872.02	29,134.62	.....	28,304.58	1,702.06
Mechanical Engineering No. 482	1,479.00	300.00	.....	.....	1,779.00
No. 568	800.00	.....	.....	611.09	188.91
Shop Account	23.56	.....	[2]500.00	493.76	29.80
No. 634	635.20	.....	.....	635.20	.....
No. 643	4,950.00	.....	.....	4,950.00	.....
Medical Department Special	899.65	221.33	[1]5,000.00	1,115.12	5,005.86
Mining Engineering No. 651	250.00	61.20	.....	311.20	.....
Ore Dressing	1,678.59	.....	[2]1,107.76	1,523.87	1,262.48
No. 709	.....	.....	[1]1,000.00	1,000.00	.....
No. 722	.....	.....	[1]6,000.00	.....	6,000.00
No. 730	.....	.....	[1]3,000.00	.....	3,000.00
No. 731	.....	.....	[1]5,000.00	.....	5,000.00

* Overdraft.

[1] Appropriation from Current Funds.

[2] By Transfer.

Schedule R (*Continued*)

Name	*Balance June 30, 1929*	*Income*	*Other Increases*	*Salaries and Expenses*	*Balance June 30, 1930*
Photographic Service	*$2,508.57	$11,698.86	[1]$1,000.00	$14,444.91	*$4,254.62
Photostat Service	594.14	5,231.95	.....	5,213.82	612.27
Physics Dept. No. 658	1,700.00	.....	.....	1,700.00	.....
No. 726	.....	.....	[2]2,200.00	2,306.67	*106.67
R. L. Ind. Phys.	3,706.92	74.00	.....	.....	3,780.92
Roentgen Ray	1,847.42	36.00	.....	.....	1,883.42
No. 675	2,000.00	.....	[1]800.00	2,800.00	.....
Hale Spect.	3,145.10	62.00	.....	.....	3,207.10
No. 756	.....	.....	[2]2,000.00	.....	2,000.00
No. 753	.....	.....	[1]350.00	.....	350.00
Poughkeepsie Race Acct.	.....	237.50	.....	2,066.48	*1,828.98
President's Fund	.....	1,000.00	.....	842.50	157.50
R. O. T. C. Uniform Accts.	*132.50	7,641.54	.....	7,004.36	504.68
Special Tuition Fund	.....	700.00	.....	.....	700.00
Squash Coaching	.....	200.00	[1]1,000.00	1,200.00	.....
Suspense Accounts	928.50	819.09	.....	1,547.59	200.00
Tech Song Book	.....	961.17	.....	1,499.66	*538.49
U. S. N. Torpedo Research	.....	2,501.86	.....	2,501.86	.....
Walker Memorial Library	285.59	2.50	[2]1,075.00	1,182.13	180.96
Buildings and Grounds Accounts					
No. 663	.....	.....	[1]7,323.68	7,323.68	.....
No. 674	.....	.....	[1]7,097.64	7,097.64	.....
No. 682	.....	.....	[1]3,585.89	3,585.89	.....
No. 735	.....	.....	[1]855.00	.....	855.00
No. 743	.....	.....	[1]1,145.00	.....	1,145.00
No. 747	.....	.....	[1]24,000.00	.....	24,000.00
Totals	$108,248.48	$344,960.68	$175,982.01	$469,377.52	$159,813.65
		(Schedule B)		(Schedule C)	(Schedule D)

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

SCHEDULE S

Current Surplus

Balance, June 30, 1929	$45,455.68
Net Decrease (Schedule A)	23,059.72
Balance, June 30, 1932 (Schedule D)	$22,395.96

Detail of Profit and Loss Account

Losses and Charges:

Students' Accounts (previous years), charged off	$267.12
Miscellaneous Charges	1,335.16
Total Losses	$1,602.28

Gains and Credits:

Premium Refund Account Employees' Insurance	$630.64
Miscellaneous Credits	1,715.26
Total Gains	$2,345.90
Profit and Loss. Net Profit (Schedule A)	$743.62

AUDITORS' CERTIFICATE

We have examined the books and accounts of the Treasurer and the Bursar of the Massachusetts Institute of Technology for the year ended June 30, 1930, and we report upon our verification of the accompanying financial statements of the Treasurer, as follows:

We agreed the investment accounts in detail with certified lists of securities obtained from the Old Colony Trust Company of Boston, Massachusetts, and from the Security Trust Company of Rochester, New York, and verified the several other assets and liabilities shown in the Treasurer's Balance Sheet, Schedule D.

We satisfied ourselves by extensive tests of the recorded transactions for the year that income receivable had been duly accounted for and expenditures properly controlled and authorized.

WE HEREBY CERTIFY that the accompanying Balance Sheet and Statements of Income and Expenditures correctly set forth, respectively, the financial condition of the Institute at June 30, 1930, and the financial results for the year ended at that date, and that the financial statements are in accordance with the books of the Institute.

We extended our examination to include the transactions relating to the accounts of the Wyeth and Hewett 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 which we found to be correctly stated.

Respectfully submitted,

PATTERSON, TEELE & DENNIS,
Accountants and Auditors.

1 Federal Street, Boston, Massachusetts
August 27, 1930
B-6170

3-31-1000-T.P.